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Indian Journal of Adolescent Medicine

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Address all correspondence to : Dr Preeti M Galagali, Editor in Chief,
Indian Journal of Adolescent Medicine, 26 Gruhalaxmi Lay out Stage1,
Basaveshwaranagar, Bangalore- 560079, Karnataka, India.
Phone : 080 - 23226535 Telefax 91- 11- 080 - 23226535
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Indian Journal of Adolescent Medicine- The Need and Importance

Currently, there are 1.8 billion, the largest ever population, of young people aged 10-24 years living in the world [1]. Of these, 358 million live in India. India has the largest number of adolescents in the world. 243 million people aged 10-19 years live in India. Adolescents are the country's demographic dividend and constitute 21.2% of the population [2]. Their psychosocial and physical well being will determine the health and progress of the nation in the future. Adolescents in India have to face the challenges of socio economic disparities, poor access to health services and education, early marriage and gender discrimination and violence [2, 3].

Adolescence is a transitional period of life between childhood and adulthood with rapid growth in bio-psycho-social domains. It is said to be a period of vulnerability and opportunity. In adolescence, there is a normative desire for independence, peer affiliation, experimentation and sensation seeking behaviour that makes this age vulnerable to risks of poor nutrition, decreased physical activity, drugs, self harm, unsafe driving, unhealthy media usage and sexual practices. The adolescent brain is flexible and open to change as it is still undergoing neurodevelopment maturation. This gives a window of opportunity to intervene and motivate the adolescent to adopt a healthy lifestyle. This would track into adulthood to ensure health over the entire life span and for the future generations. Hence it is essential to invest in adolescent health [4, 5].

The WHO Global Accelerated Action on Adolescent Health states that health professionals should lead the international and national revolution in adolescent health care by collaborating with other stakeholders [6]. Worldwide, pediatricians are the strongest advocates for child and adolescent health.

In 1999, the Indian Academy of Pediatrics (IAP) adopted the age on policy of pediatric care. This policy stated that paediatricians should look after healthcare needs of young people upto and including 18 years of age [7]. This led to the formation of IAP committee on adolescent health and the establishment of Adolescent Health Academy (AHA IAP) in 2000, as a multidisciplinary, speciality chapter of IAP, dedicated to health and well being of adolescents of India. In the last 19 years, Adolescent Health Academy has conducted many skill and capacity building professional training programs and community oriented activities to promote adolescent health in all parts of the country. With the recent global impetus to adolescent health and the launch of the national adolescent health strategy, Rashtriya Swasthya Kayakaram, AHA IAP felt the need to promote research and publication in adolescent medicine in India. The launch of Indian Journal of Adolescent Medicine, the official publication of Adolescent Health Academy, Indian Academy of Pediatrics, is an important step in reaching this goal.

Indian Journal of Adolescent Medicine is a biannual open access peer reviewed electronic journal. The mission of the journal is to publish quality; evidence based scientific and research articles focussing on issues related to adolescent health in India and neighbouring countries. To accomplish this mission, the journal has renowned national and international adolescent health experts as editorial board members. The contents of the journal include theme based review articles, case reports, profiles of drugs used in adolescent medicine, updates on recent advances and a book review. The journal invites research articles for publication. The journal gives importance to the voices of adolescents in planning their health care. It has an exclusive section named 'viewpoint' where inputs are invited from a young person and an expert on an important health related issue. This section would help the health professionals to understand the need of their young clients and plan health services accordingly. In the future, the editorial board envisages increasing the repertoire of articles, publishing a section on 'letters to the editor' and initiating the process of indexing the journal.

The inaugural issue of Indian Journal of Adolescent

Medicine has review articles on the burning issue of substance abuse in adolescence in India. Lately there has been a surge in use of drugs in adolescence including marijuana and opiods in India[8]. This journal issue has interesting articles on situational analysis, vulnerability in adolescence, socioecological determinants, flag signs, clinical management and prevention of drug use. The case history describes a case of anorexia nervosa with refeeding syndrome and the article on emergency contraception gives an in depth description of its types and indications. Briefs of recent research in adolescent medicine and a review of a book on gender issues are also published. This issue has a special section with collection of paper, posters and case abstracts submitted for oral presentation during Adolescon 2019, the 19th Annual Conference of Adolescent Health Academy IAP at Bengaluru, Karnataka.

Indian Journal of Adolescent Medicine aims to publish quality science and fulfil the need of 'published' research from low middle income countries, where most of the adolescents in the world live. It would help policy makers to make region specific, need based effective adolescent health programs and assess their impact. The journal will bridge the gap between research and clinical medicine and encourage the practice of evidence based adolescent health care in office practice. Thereby the journal has an important role in nurturing adolescent health and promoting physical, emotional and psychological well being in adolescence. Please share a feedback regarding the journal on ijoamaha@gmail.com

"Never doubt that a small group of thoughtful, committed, citizens can change the world. Indeed, it is the only thing that ever has." – Margaret Mead

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PREETI M GALAGALI
Editor in Chief, Indian Journal of Adolescent Medicine, Bengaluru

Substance Use in Adolescents: Situational Analysis

CM KUMAR[1], OBEID SHAFI[1], SHWETA SINGH[1]

From [1]Hamdard Institute of Medical Sciences and Research, Jamia Hamdard, New Delhi
Correspondence to: Dr CM Kumar, D 1104, Aditya Celebrity Homes, Sector 76 Noida UP 20130, India
cmkumar1@rediffmail.com

Adolescence is a period of experimentation, exploration, identity formation, risk taking and automony bids. This leads to a higher incidence of drug abuse in adolescents compared to the general population. Adolescent substance use differs from that of adults in that progression from casual use to dependence occurs more quickly, more likely to use multiple substances and are at higher risk of presenting with psychiatric comorbidities. The prevalence of substance use by adolescents has increased substantially in recent times and is a major public health issue which has significant short and long term repercussions. There is a need for greater awareness and education regarding drug use in adolescence for prevention and treatment.

Key Words: *Drug use, Adolescents, Statistics*

Adolescence is a time of physical, emotional and psychological maturation as well as a period of searching for independence and experimentation. One area of experimentation associated with adolescence is substance use. Although many adolescents experiment with drugs and alcohol from time to time without enduring problems, those who develop the disorders of substance abuse and dependence make substance use a major public health concern.

Substance use among children and adolescents is a public health concern in several parts of the world [1]. Onset of substance abuse during the formative years interferes with academic, social and life skills development, and warrants both primary and secondary prevention. Globally, India has one of the highest proportions of children and adolescents (aged <18 years: 45% of the population; 5–19 years: 35.3% of the population) [2].

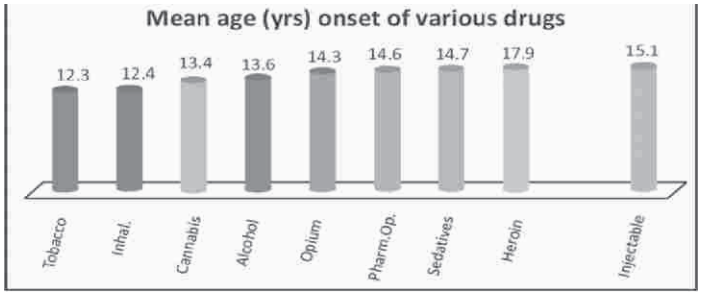
Substance use refers to the use of any psychoactive substance or drug, including licit and illicit drugs, other than when medically indicated [3,4]. According to the World Health Organization substance abuse is persistent or sporadic drug use inconsistent with or unrelated to acceptable medical practice. Today, there is no part of the world that is free from the curse of drug trafficking and drug addiction. All over the world, millions of people with drug addiction are leading miserable lives between life and death. India too is caught in this vicious circle of drug abuse and the numbers of drug addicts are increasing day by day [5].

The incidence of drug abuse among children and adolescents is higher than the general population. In developed countries drug abuse among youth is generally associated with particular youth subcultures and lifestyles, causing an acceptance of drugs and their use by members of the subcultures. In Asia, the figures for drug abuse are not exactly known but after cannabis, Amphetamine-type Stimulants (ATS) are the most commonly used amongst children and youth [6].

Over the last few decades, drug consumption has become one of the biggest problems affecting millions of children and youth in the country. The issue of substance abuse is especially rampant in a few states and cities in India and they have taken the lead in drug consumption. Punjab, in the Northern part of India has been facing a drug epidemic since a very long time, though it is considered to be one of the most developed states of the country. The national capital is also facing a significant problem with substance abuse. States like Mizoram, Manipur, Goa and Mumbai are other prominent states affected by the drug problem [7].

In India, an NGO survey revealed that 63.6 % of patients coming in for treatment were introduced to drugs at a young age below 15 years [6]. Another report showed that 13.1% of the people involved in drug and substance abuse are below 20 years (Figure 1).

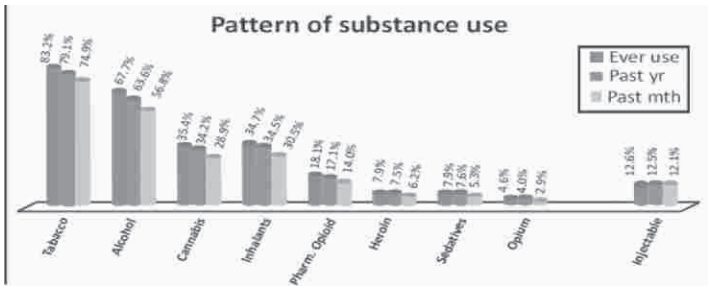
Figure 1



Mean age of initiation of various drugs/substances in India [8]

A survey shows that of all alcohol, cannabis and opium users 21%, 3% and 0.1% are below the age of eighteen [6]. A recent large scale multi-site survey, the first of its kind in India, included almost 4000 school-going, out-of-school as well as street children across over 100 cities and towns in various states. The survey revealed that the most common substances used were (Figure 2): Tobacco (83.2%) and alcohol (67.7%), followed by cannabis (35.4%), inhalants (34.7%), pharmaceutical opioids (18.1%), sedatives (7.9%) and heroin/smack (7.9%). Use of injectable substances was reported by a significant proportion (12.6%) [8]. In contrast, in US marijuana is the most common substance abused in adolescents [9].

Figure 2



Pattern of substance use in India [8]

The use of tobacco is another major concern amongst children. In India 20 million children a year and nearly 55,000 children a day are drawn into a tobacco addiction. The number is shocking when compared to the 3000 a day new child smokers in the US [6]. Inhalant abuse is unique in that it is the only category of substances for which the prevalence of current use among children and adolescents is higher (1.17%) than adults (0.58%) [10]. An emerging trend about child drug abusers is the use of a cocktail of drugs through injection, and often sharing the same needle, which increases their risk of HIV and other infections [6]. Interestingly, the preference or choice of substances abused showed some regional variations in a large national study. Majority of children and adolescents surveyed in Karnataka and Andhra Pradesh (85-89%) reported current use of alcohol. Highest proportion of cannabis users were present amongst the study population from Uttaranchal (70%) followed by Haryana (63.3%). Meghalaya had the highest proportion of heroin users (27.3%); while Tripura had highest proportion of inhalant users (68.3%). Mizoram had the highest proportion of sample with injectable substance use (88.6%) compared to rest of the states [8].

Unfortunately, in India, we do not have sensitization programs about drug abuse in schools or for children out of school, owing to the lack of a robust substance abuse policy. Children who at times do not have access to high quality drugs, will use volatile substances easily found in local stores such as cough syrups, pain relief ointments, glue, paint, gasoline and cleaning fluids. There are very few to almost no health centers that deal with child substance abuse problems, especially in the rural areas. The issue of substance abuse among adolescents has now been recognized as an emerging health problem in India and the situation is being studied and preventive strategies are evolving. Sensitization programs and drug de-addiction centers/ rehabilitation centers are need of the hour to deal with this menace.

CONCLUSION

Adolescence represents an important phase of life during which substance use behaviors can get established and thus become a public health issue. To prevent these behaviors from occurring, it is important to reduce the escalation to heavy drug use and intervene to address the established problematic substance use.

Pediatricians have a major role in preventing use of illicit substances and early identification of adolescents at risk. There is a need for increased education and awareness regarding this growing menace. Pediatricians should incorporate screening for substance use at all adolescent clinic visits, so that interventions and referral (if indicated) can be done at the earliest.

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Neurobiological Basis of Vulnerability in Adolescence to Drug Use

SUNITA MANCHANDA[1]

From [1]*Max Hospital Gurugram, Haryana*

Correspondence to: Dr Sunita Manchanda, Max Hospital, Gurugram,122001, Haryana, India

s_manchanda04@yahoo.co.in

In adolescence, there is heightened susceptibility to drugs. Neurobiology of addiction is based on the working of four neural networks: (a) reward (b) memory and learning (c) motivation/drive (d) control. Knowledge of neurobiological vulnerabilities is essential for prevention and treatment interventions.

Key words : *Substance abuse, Neurobiological basis, Drug addiction*

Adolescence is a critical period of life in which the developing brain is highly vulnerable to the impact of life experiences. It is also a time of heightened susceptibility to the effects of addictive drugs.Various factors have been associated with increased risk of substance use during this period. Epidemiological evidence suggests that substance use disorders (SUDs) are more likely to develop in people who begin experimenting with drugs early during their adolescence, but this correlation does not guarantee causation.The neurobiological mechanisms underlying vulnerability to drug addiction are poorly understood and are likely to involve a balance between factors that confer vulnerability and those that protect against it. Research involving genetics has shown that natural variations in proteins which are encoded by a person's genes can lead to individual differences in vulnerability to drug use. Based on the differences between the identical and non-identical twins, a study showed that 50-60 percent of addiction is due to genetic factors [1, 2]. 50 percent of addiction is said to be due to poor coping, emotional and stress management skills. If a parent has an addiction, the child has 8 times greater chance of developing the same [3]. Current research on genetic and epigenetic mechanisms, neural pathways, neurotransmitter systems, molecular mechanisms and immune mediators is enabling scientists to understand the neurobiological substrates that lead to addiction.

NEUROBIOLOGICAL BASIS OF ADDICTION

The mesolimbic pathway sometimes referred to as the **reward pathway** is identified as the key component in reward assessment [4]. The progression from initial drug use to addiction may involve repeated activation of the mesolimbic pathway which increases the motivational salience (a form of attention that motivates toward a behavior) of the drug. As contextual cues become associated and strengthened with repetitive drug administration, a process initially under the purview of the mesolimbic dopaminergic system progressively incorporates the neurocircuitory involved in emotional, memory, obsessive thoughts, stress response, decision making, and behavioral inhibition, into the drug experience [4]. Even in the absence of ongoing drug use these neuro-adaptive responses remain activated and are considered to be a primary factor in drug addiction and relapse.

A model involving a network of four circuits is fundamental to understand the neurobiological basis of drug abuse and addiction [5]. Anatomically they are represented as in Figure 1 and their description is as follows [6]: -

(a) **Reward**: located in the nucleus accumbens (NAc) and the ventral pallidum

(b) **Memory and Learning**: located in the amygdala and the hippocampus

(c) **Motivation/Drive**: located in the orbitofrontal cortex (OFC) and the subcallosal cortex

(d) **Control**: located in the prefrontal cortex and the anterior cingulate gyrus

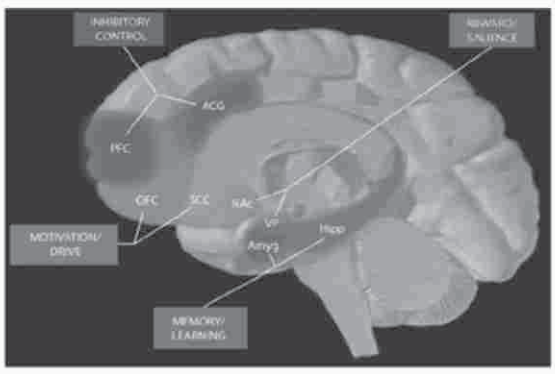

Figure 1: The anatomy of the human reward system (From National Institutes of Drug Abuse (NIDA))
PFC – prefrontal cortex; **ACG** – anterior cingulate gyrus; **OFC** – orbitofrontal cortex; **SCC** – subcallosal cortex; **NAc** – nucleus accumbens; **VP** – ventral pallidum; **Hipp** – hippocampus; **Amyg** – amygdala

(a) Reward: The mesolimbic pathway is a collection of dopaminergic (i.e., dopamine-releasing) neurons that project from the ventral tegmental area (VTA) in midbrain to the ventral striatum (nucleus accumbens and olfactory tubercle) of basal ganglia .The VTA consists of dopaminergic, GABAergic and glutamatergic neurons. The nucleus accumbens and olfactory tubercle are primarily composed of neurons. The nucleus accumbens is further divided into two regions known as the NAcc shell (limbic region) and NAcc core (motor region). Medium spiny neurons in the nucleus accumbens receive inputs from both the dopaminergic neurons of the VTA and the glutamatergic neurons of the hippocampus, amygdala, and medial prefrontal cortex. The medium spiny neurons' projections on activation release GABA onto the pallidum. These pathways from mesolimbic area release dopamine into the nucleus accumbens which regulates incentive salience (i.e., motivation and desire for rewarding stimuli) and facilitates reinforcement and reward-related motor function learning[7].At present dopamine is believed to have a minor role in pleasure perception though initially it was thought to be a primary mediator. One of the main factors in development and maintenance of addiction is dysregulation of the mesolimbic pathway.

(b) Memory and learning: Di Chiara posits that the repeated use of drugs strengthens both stimulus-response and stimulus-reward associations, thus sensitizing the mesolimbic pathway and seems to be linking the association between the drugs and its associated cues. The acquisition, storage and expression of emotional memories and assigning a reward and fear value to stimuli is executed by amygdala. The caudate putamen receives the densest innervation by dopamine afferents and based on study of drug-induced adaptive changes in particular is known to mediate habitual responses [8].

(c) Motivation/Drive and control: Chronic drug exposure induces long-lasting neural adaptations resulting in drug craving, compulsive drug seeking and a high propensity to relapse. Relapse in response to a priming dose of drug, drug cues, craving, and stress involves various brain regions: mesolimbic (priming), mesolimbic and amygdala (drug cues), striato-thalamo-orbitofrontal (obsessive thoughts), extra hypothalamic corticotropin-releasing factor (CRF) and hypothalamic-pituitary-adrenal (HPA) including the amygdala and bed nucleus of striaterminalis (BNST) (stress). Compulsive drug drive and inhibitory dyscontrol are two main mechanisms involved in relapse. The relationship of drug drive and inhibitory dyscontrol to dopaminergic dysregulation are observed in drug-addicted subjects [4].

The pathway involved in the compulsive drive for substances is the striato-thalamo-orbito frontal circuit [4]. This circuit is tightly interconnected with other prefrontal and limbic regions, including the anterior cingulate gyrus (ACG), insula, dorsolateral prefrontal cortex (DLPFC) and amygdala. Innervation includes both the mesocortical dopaminergic pathway, which projects to PFC regions that include the OFC (orbitofrontal cortex) and anterior cingulate gyrus and glutamate neurons that project reciprocally between the PFC and amygdala, as well as from the PFC to the NAc and VTA. The OFC and anterior cingulate also play a prominent role in the obsessive thoughts and craving .The slip-induced relapse, cue-induced cravings, obsessive thoughts, and return to drug use following traumatic events can be thwarted by a robust inhibitory control over the compulsive drive state [4].

(d) **Control**: The orbitofrontal cortex (OFC) is a prefrontal cortex region in the frontal lobes (also known as ventromedial prefrontal cortex) is involved in the cognitive thought process of decision-making[9]. Recent evidence suggests that the medial OFC is involved in making stimulus-reward associations with connections to the hippocampus and cingulate and with the reinforcement of behaviour, is involved in assessing the familiarity or "rightness" of a situation and in integrating outcome expectancies., while the lateral OFC, with connections to the amygdala and insula is associated with the suppression of previously rewarded responses and is required to change behaviour (i.e., to provide "stop" signals) involved in stimulus-outcome associations and the evaluation and possibly reversal of behaviour [4].The OFC is critically involved in assessing the salience of potential rewards and punishments (i.e., pleasurable or not , gain if any whether immediate or delayed) and is involved in both impulsivity as well as in decision making [4]. Even in the absence of a compulsive drug drive, the relative absence of inhibitory control may lead to spontaneous drug use. Brain regions involved in the inhibitory processes, particularly the OFC and the anterior cingulate, have therefore been the focus of several neuroimaging studies of subjects with substance use disorders. PET, fMRI and sMRI (functional and structural MRI) has been used in intoxication, cortical executive dys-control, craving, withdrawal and motivational salience paradigms [8].

These four circuits receive direct innervations from DA neurons and are also connected with one another through direct or indirect projections. The increased activation of connections in reward, memory, motivation circuit during addiction overcomes the inhibitory control of control circuit, hence leading to addiction after initiation and persistent consumption of drug as shown in figure 2.

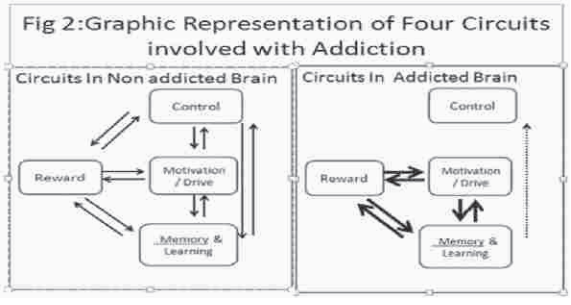

Figure 2: Graphic representation of Four Neurocircuits in the Brain

PET and fMRI neuroimaging studies of cocaine and nicotine-addicted subjects show that cue exposure to drug-associated stimuli induces an activation of the amygdala region. Dopamine changes in NAc were correlated with euphoria and high [8]. OFC is hypoactive during withdrawal with decreased DA (as assessed by decreased D2 receptor occupation) activity. OFC is hyper metabolic during craving- compulsivity[8].PFC hypo-activity in noted in addicted individuals during working memory tasks.The sections on priming and drug cues also describe intracellular mechanisms involved in addictive processes. Dopamine receptor stimulation in NA causes activation of transcription factors (c-fos, NAC-1, CREB), CREB protein, FosB, GluR2 and CDK5 [8]. Many nuclei which are involved in addiction pathway like ventral tegmental area, amygdala, and nucleus accumbens produce brain-derived neurotrophic factor (BDNF) on exposure to addictive drugs.BDNF has been shown to influence many cellular processes including long-term potentiation and spine morphology[8].BDNF is generally increased by acute drug administration and appears to undergo further elevation during drug abstinence [8].

VULNERABILITY IN ADOLESCENCE TO DRUG USE

Changes in neuronal structure and function in brain areas related to reward and habit formation during adolescence influence susceptibility to drug dependence, though studies favouring this are limited. Evidence suggests that many structural and functional changes that occur in the brain of adolescent humans and rodents as they progress to adulthood are very similar. Vulnerability of adolescent to drug addiction is being addressed by summarizing results from animal studies. The studies by Schramm-Sapyta NL et.al suggest that a different “balance” of rewarding and aversive effects of drugs of abuse experienced by adolescents could represent a potential vulnerability. Four conclusions drawn were : (i) The balance of rewarding versus aversive effects of drugs of abuse is tipped toward reward in adolescents may cause increase consumption of drugs of abuse by adolescents.(ii) Adolescents are consistently less sensitive to withdrawal effects. This could both promote drug use in early stages and protect against development of compulsive drug seeking after long-term use. (iii) Adolescents are not consistently more sensitive to reinforcing or locomotor effects of drugs of abuse as shown in self-administration and sensitization studies. (iv) changes in neuronal structure and function in brain areas related to reward and habit formation, although studies demonstrating causality are currently lacking [10].

According to current research, the following changes in neuronal structure may make adolescents vulnerable to drug abuse.

1. Ongoing Neurodevelopment (Developing neural network): Human brain is capable of making hundreds of trillions of connections between neurons. (neural network). These neural interconnections are in immature form to begin within a child and undergoes pruning which starts around 11years and gets mature (also known as hard wiring) during the adolescence. This ongoing neuro-development make them prone to risk-taking behaviour like drug use. Susceptibility for developing a drug abuse and addiction increases because early drug use may alter brain maturation and can cause long lasting cognitive impairment of certain functions [11].

2. Immaturity of the prefrontal cortex (Thinking brain which takes responsible decisions): Prefrontal cortex is less active during adolescence and young adulthood [12]. The neural connections are weak among the prefrontal cortex itself, and there are weak connections between the prefrontal cortex and nucleus accumbens, a component of the limbic system involved in the brain's reward system, which puts them at an increased risk for making poor decisions making them prone to drug addiction [13].

3. Heightened sensitivity of limbic reward system: Adolescence is a period of heightened susceptibility to the effects of addictive drugs. In adolescence, limbic system is sensitive to reward. Adolescent gets greater sense of pleasure by taking drugs as there is greater communication between dopamine-rich neurons. This hypersensitivity of limbic system encourages behaviours related to addiction [14]. In two studies with mice and humans the investigators from Baylor College of Medicine, US, have found that the adolescent's hypersensitivity to cocaine and nicotine is due to ability to produce (or synthesize) new proteins, regulated by the molecule eIF2 [14].

Various predictors of youth initiating drug abuse are poorer performance on tasks of inhibition and working memory, smaller brain volumes in reward and cognitive control regions, less brain activation during executive functioning tasks and heightened reward responsivity. Knowledge of role of these predictive and addictive factors can help us to identify at-risk youth and we can plan specific and targeted interventions for prevention and treatment.

CONCLUSION

Adolescence is a period of vulnerability for developing substance use disorder. Recent neuropsychological and neuroimaging studies have helped us to understand underlying neural vulnerabilities that contribute to initiation and continued use of substances during adolescence. The neuronal network maturation and reward system undergoes dramatic developmental changes during adolescence and further research is required to precisely explain causality and individual predisposition to SUD

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REVIEW ARTICLE

Socio Ecological Determinants of Drug Use

DEEPA PASSI[1]

From [1]*Apollo Hospitals, Noida, Haryana*

Correspondence to:Dr. Deepa Passi, Senior Consultant, Apollo Hospitals, Noida, Haryana, India

dr_passi@yahoo.co.in

Socioecological determinants influence drug use in adolescence. Multiple contextual risk and protective factors in the individual, family, peer and community domains predict use of substances.

Keywords: *Socioecological determinants, Risk factors, Protective factors*

The rising burden of substance abuse among adolescents is a major public health challenge worldwide. Substance use disorders (SUD) are due to a complex interplay between genetics, personality trait, environment and life events. The transition from initiation to intermittent or regular use is based on many factors including impulsivity, risk-taking tendencies, stress response and comorbidity in addition to environmental factors. Social determinants are defined as 'the conditions in which people are born, grow, work, live, age and wider set of forces and systems shaping the condition of life' [1].

The distribution of social determinants is determined by public policies that reflect prevailing political ideologies of the area. The complex, integrated and overlapping social structures and economic systems are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services and structural and societal factors. Social determinants of health are influenced by the distribution of money, power, and resources throughout local communities, nations and the world [2].

Drug abuse is a complex phenomenon, which has various social, ecological, cultural, biological and economic aspects. The disintegration of the old joint family system, the absence of parental care in modern families where both parents are working and the decline of religious/moral values is leading to a rise in the number of adolescents taking drugs to escape the harsh realities of life. The rapid urbanization, industrialization and people migrating from peripheries have led to the change in the traditional fabric of social control making the adolescents vulnerable to the stresses and strains of modern life. The fast-changing social milieu, the political policies, lax drug control and media policies, among many other factors, are mainly contributing to the proliferation of drug abuse. Indian society, which enjoys cultural diversity, has a history of use of plant products e.g. cannabis, opium and home-brewed alcohol beverages. The ecological systems theory of Urie Bronfenbrenner 1979 holds that an individual encounters different environments throughout the lifespan that may influence behavioural outcomes in varying degrees [3]. These systems include the following

1. Micro System is the smallest and most immediate or direct environment in which the child lives. It comprises of child's family, friends, classmates, teachers, neighbours and other people who have a direct contact with the child.

2. Mesosystem involves the relationships between the microsystems in one's life. It involves linkages between home and school, between peer group and family, or between families. For example, if a child is neglected by his parents, he may have a low chance of developing positive attitude towards his teachers and peers and may resort to withdrawal from peers or to substance use.

3. Exosystem pertains to the linkages that may exist between two or more settings. Suppose a child is more attached to his father than his mother. If the father goes abroad to work for several months, this may adversely affect mother and the child's social relationship, or on the other hand, this event may result to a tighter bond between the mother and the child.

4. The Macrosystem is the actual culture of an individual. The cultural contexts involve the socioeconomic status of individuals and/or their family, their ethnicity or race. For example, being born to a poor family makes a person work harder every day.

5. The Chronosystem includes the transitions and shifts in one's lifespan. This may also involve the socio-historical contexts that may influence a person. One classic example of this is how divorce, as a major life transition, may affect not only the couple's relationship but also their children's behaviour.

There are certain social groups which are more vulnerable to substance abuse. Caste, religion and local customs play a significant role in the initiation of substance use. Substance abuse in adolescents occurs as a spectrum from experimentation to dependence.

Risk factors can increase a person's chances for drug use, while protective factors can reduce the risks. Risk and protective factors can affect children at different stages of their lives. There is an extensive number of risk factors that may contribute to the onset of substance use among adolescents. These risk factors can be primarily divided into individual, family, peers, school and community factors.

INDIVIDUAL DOMAIN

Stress arising from academic pressure, conflicts at home, low self-esteem, social skill deficit, aggression, impulsivity, relationship issues, different sexual orientation and mental disorders like depression and anxiety can predispose adolescents

to drug use. Personal values and beliefs influence attitudes towards substance use. High self-esteem, problem solving and self-control skills, having positive future plans, positive interaction with people, sense of belonging and sharing emotional upheavals with parents and care-takers are protective factors.

FAMILIAL DOMAIN

Physical and sexual abuse, parental neglect and emotional deprivation, parental drug use, separated parents, unemployed parents with negative communication patterns (e.g. criticism, blaming and lack of praise), lack of family rituals, poor family values and ties, parental approval of substance use, sending children for procurement of alcohol, cigarettes or preparing a drink and easy access to money are risk factors in the familial domain [4].

Protective factors are positive and nurturing family relationships, parental competence (e.g. ability to listen, set reasonable expectations, monitor child's activities and model healthy attitudes and behaviours), strong family ties with reliance on family for emotional support and parental disapproval of substance use.

PEER DOMAIN

Association with peers who use drugs and feeling of autonomy by being associated with such gangs are risk factors for drug use. Peer acceptance is a potent reward for adolescents and hence, association with gangs to get a feeling of belonging, contribute to increased drug use [5,6,7]. Protective factors are association with friends who don't use drugs, and developing coping, assertive and drug-refusal life-skills.

SCHOOL DOMAIN

The key risk periods for drug abuse are during major transitions in children's lives. The first big transition occurs when they advance from elementary school to middle school and experience new academic and social challenges and situations. At the same time, they are exposed to increased availability of drugs and social activities involving drugs [8].

Risk factors are school failure, poor academic performance, poor attendance, involvement in fights and conflicts, disengagement with learning, learning disabilities and bullying. Protective factors are school connectedness, involvement in extra academic activities and sports, regular school attendance, good academic performance, providing leadership and decision-making opportunities for students, a school responsive to student's needs and a drug free school environment.

COMMUNITY DOMAIN

At the community level, the settings where we live and work can influence the decisions we make and our subsequent behaviours. Easy drug availability and acceptable social attitudes make experimentation easy [9].

A high rate of drug use is seen in areas of the city with poor parental functioning, higher crime and unemployment rates. Teenagers may use street drugs for recreational purposes. The vested interest of politicians, lax law enforcing policies and poor media regulation further aggravate the situation.

Protective factors are community cohesion, programs, projects and activities for the youth, early childhood and family support, community service opportunities and resources (housing, healthcare, jobs, recreation), welfare policies and enforcement of anti drug laws and use of mass media for promoting a healthy lifestyle and discouraging drug use.

CONCLUSION

Several biological, social, environmental, psychological and genetic factors are associated with substance abuse. Substance abuse is also strongly influenced by interpersonal, household and community dynamics. Adverse circumstances like traumatic experiences or comorbid mental disorders also play a crucial role. Ready access to substances lowers the barriers to acquiring, using and abusing substances. It is important to understand the socio ecological determinants of drug use to plan intervention and prevention strategies.

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REVIEW ARTICLE

Common Drugs of Abuse

SONIA BHATT[1]

From [1]*F H Medical College, Agra, Uttar Pradesh*
Correspondence to: Dr. Sonia Bhatt, Professor and Head, Department of Paediatrics, F H Medical College, Agra, Uttar Pradesh, India
soniabhatt19@gmail.com

Adolescents abuse drugs that are common and readily available like tobacco, ethanol, over-the-counter products, marijuana and inhalants. Adolescent health professionals should be familiar with routes of administration, street names and systemic effects of individual drugs.

Key words: *Common drugs, Street names*

INTRODUCTION

Adolescent drug abuse is a common problem associated with many comorbidities and complications. The initiation of drug abuse in adolescence usually tracks to the adulthood. According to a study conducted by the National Commission for Protection of Child Rights, the common drugs of abuse among children and adolescents are tobacco and alcohol, followed by inhalants and cannabis. The mean age of onset was lowest for tobacco (12.3 years), followed by onset of inhalants (12.4 years), cannabis (13.4 years), alcohol (13.6 years), proceeding then to the use of harder substances opium, pharmaceutical opioids, heroin (14.3–14.9 years) & then substances through injecting route (15.1 year) [1].

Chemical composition, Street names, route of administration, mechanism of action of common substances of abuse are given in Table 1

NICOTINE

Adolescents and children are the prime targets of the tobacco industry. According to WHO report adolescents in India start smoking early. The India Global Youth Tobacco Survey (GYTS) conducted on adolescents aged thirteen to fifteen years revealed that 14.6% of students used some form of tobacco and 4.4% smoked cigarettes [2]. Though the level of cigarette use has been dropping significantly as perceptions of risk increase, nicotine use continues to be a topic of concern for teens and adolescents. A factor is the rising trend of e-cigarette use among younger teens [3]. These are electronic nicotine delivery systems that are battery operated, which heat and then vaporize nicotine dissolved in propylene glycol, glycerine or other solvents. They come in tobacco, mint, cherry or chocolate flavours and are highly appealing to adolescents. Adverse effects include dry cough, throat irritation and lipoid pneumonia. Potentially toxic substances like diethylene glycol and carcinogens like nitrosamines have been detected in vapour [3].

ALCOHOL

Alcohol is commonly abused by teens. The social acceptance of drinking among people can lead many teens to view alcohol as relatively harmless. Research suggests teens are more likely to binge drink because their impulse control centre has not fully developed [4].

MARIJUANA (Cannabis)

Marijuana refers to the dried leaves, flowers, stems and seeds from the *Cannabis sativa* or *Cannabis indica* plant. The plant contains the mind-altering chemical tetrahydrocannabinol and other similar compounds [3]. An analysis of cannabis markets shows that low prices coincide with high levels of abuse, and vice versa[5].

OPIOIDS

Opium is a dark brown, resinous material obtained from poppy (papaver somniferum) capsule. Morphine is the principal alkaloid in opium. *A* wide range of painkillers are being abused by teens and adults. These include: morphine, fentanyl, codeine, tramadol. Teens abuse the tablet forms of these drugs by taking them orally or in some cases by crushing and snorting or injecting them [6].

TRANQUILIZERS

Tranquilizers include depressants or sedatives like benzodiazepines, barbiturates and sleep medications [6]. These substances are helpful in treating anxiety disorders, seizures and sleep problems when taken as prescribed in pill form but have a high potential for abuse and dependence [1].

AMPHETAMINES:

Amphetamines are medications prescribed primarily for attention-deficit/hyperactivity disorder (ADHD) that is comprised of two substances: amphetamine and dextroamphetamine [6]. It is a white odourless, bitter tasting powder that is particularly popular among adolescents and young adults because of its potency and ease of absorption [3].

When taken as prescribed, amphetamines and other stimulant medications can be safe and effective. When taken in ways other than prescribed, they can be dangerous and addictive. Abusers are generally teenagers seeking thrill or kick which is obtained on rapid intravenous injection [3].

COCAINE:

Cocaine, an alkaloid extracted from leaves of Erythroxylum Coca, is supplied as the hydrochloride salt in crystalline form.

Smoking the cocaine alkaloid involves inhaling the cocaine vapours in pipes or cigarettes mixed with tobacco or marijuana. To sustain the high, cocaine users repeatedly use cocaine in short period of time known as "binges"[3].

INHALANTS

Inhalants are abused by sniffing, snorting or huffing fumes: directly from a bottle, from a soaked cloth, from a balloon or sprayed from an aerosol container. A number of liquid or gas items are abused for their intoxicating effects, with most of these substances being legal and available in many homes and businesses [3]. The inhalants are one of the first substances that teens living on the streets experiment due to their availability, easy access, and ability to create a desirable "high" that is similar to alcohol intoxication.

DEXTROMETHORPHAN

Many over-the-counter medicines for coughs and colds contain the active ingredient dextromethorphan (DXM). When used as directed, the substance treats cold symptoms, but at higher doses, it can produce an intoxicating and dissociative effect [6]. DXM-containing cough medicine is an inexpensive, legal, and easy-to-obtain high drug, although certain states have begun to regulate its sale to minors. Teens can easily get it from their home or in pharmacies.

HALLUCINOGENS

Several naturally occurring and synthetic substances are used by adolescents for their hallucinogenic properties [6].This group of substances contains psychoactive drugs that distort reality by triggering hallucinations, delusional thinking, and/ or skewed experiences of time and space [3]. While hallucinogens may not be as easily available as other substances like alcohol and marijuana, their appeal lies in two main factors: their sought after ability to distort the environment of the user looking for novel recreational experiences and their lower perceived risk compared to other substances like cocaine or heroin.

TABLE 1**:** STREET NAMES, ROUTE OF ADMINISTRATION, MECHANISM OF ACTION OF COMMON SUBSTANCES OF ABUSE

Category	Common/Street name [5]	Route of administration	Mechanism of action [6]
Tobacco and tobacco products			
Regular tobacco cigarettes	Cigs, Darts, Rollies,Coffin Nails, Bidis	Inhaled, smoked	Nicotine, the primary active ingredient is addictive. Action mediated through nicotinic acetylcholine receptors in brain
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Chewing Tobacco	Gutka, Khaini, Pan, Snuff	Swallowed, Chewed	
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Hookah	Shisha, Goza, Hubble-bubble	Inhaled	
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E-cigarettes	Vapes, E-cigs Vape-pipe	Inhaled	

Category	Common/Street name [5]	Route of administration	Mechanism of action [6]
Alcohol Beer, whiskey, rum, vodka, country liquor	Todi, Juice, Hard stuff, Moonshine, Sauce, Draft, Oats Soda	Consumed orally	GABA receptor mediated synaptic inhibition, inhibition of NMDA excitatory amino acid receptors, $5HT_3$ (serotonin) receptor stimulation
Cannabis Marijuana --- Synthetic marijuana	Bhang, Ganja, Charas Hashish, Weed, Grass, Aunt Mary --- Spice, k2, Crazy Clown, Aroma, Black Mamba, Dream, Funky monkey	Smoked as a cigarette, consumed as brownies --- Smoked or mixed with marijuana or brewed as a tea for drinking.	Active ingredient-tetrahydrocannabinol. Synthetic marijuana are mixture of herbs or plant material that has been sprayed with artificial chemicals
OPIATES Codeine --- Morphine Roxanol,Duramorph --- Methadone --- Fentanyl and Derivatives --- Hydrcodone/Vicodine/Lorcet --- Heroin	Captain Cody, Schoolboy, Cody, Syrup, Pancakes, Doors and Fours --- Heroin, Dodda, Apheem, Smack Junk, White stuff, Miss Emma --- Methadose-fizzies,(with MDMA-choclate chip cookies) --- Apache, China girl, Friend, Jackpot --- Vike, Watson-387 --- Brown Sugar China white ,horse Junk, Nose Drops Smack, Cheese	Injected, Swallowed --- Injected, swallowed, smoked --- Swallowed, injected --- Injected smoked and snorted --- Oral intake --- Snorted, injected and suppository	Morphine is the principal alkaloid. Act on opioid receptors. Exercise inhibitory modulation by decreasing release of junctional transmitters..

Category	Common/Street name [5]	Route of administration	Mechanism of action [6]
INHALANTS Volatile solvents(paint thinners, glue, aerosols (spray paint, hair spray), gases (propane tanks, lighter fluid), nitrites(poppers or video head cleaners)	Dusters, Gulley Huff, Laughing Gas, Poppers, Rush, Snappers Whippets	Inhaled, sniffed, snorted	Disrupt signalling activity in the brain and rest of the body Leads to delayed reactions and inability to process information quickly.
SEDATIVES/ DEPRESSANTS Barbiturates Phenobarbital --- Benzodizapine Diazepam, Nitrazepam, Alprazolam, Flunitrazepam (date rape drug)	Barbs, Red Birds, Yellow Jacket, Pinks Reds and Blues --- Blue V, Candy Downers, Sleeping Pills	Injected Swallowed --- Injected Swallowed	Increase the effects of GABA in the brain.
STIMULANTS Cocaine --- Amphetamine Adderall --- Methylphenidate *Ritalin, Concerta*	Coke, Speedball Sniff --- Bennies, Black beauty Crosses, Heart Speed, Truck Driver --- The smart drug Skippy, R-ball, Vitamin R, Poor man's cocaine, Diet Coke, Kiddy Coke	Injected, swallowed, smoked, snort --- Injected, swallowed, smoked, snorted --- Injected, swallowed, smoked, snorted	Increase the levels of dopamine and norepinephrine

Category	Common/Street name [5]	Route of administration	Mechanism of action [6]
HALLUCINOGENS LSD *(d lysergic acid diethylamide)* --- PCP (*Phencyclidine*) --- MDMA *(methylenedioxymethamphetamine)* preferred drug at rave party --- Ketamine	Acid, Blue Heaven, Cubs Dots --- Angel Dust Love Boat --- Peace Pill Adam Beans, Disco Biscuits, Molly Peace --- Cat, Jet K, Kit Kat, Purple, Vitamin K	Applied to absorbent paper, taken as liquid or tablet. --- Consumed orally as liquid or tablet --- Consumed orally as liquid or tablet --- Injected	Act primarily upon 5HT receptors, partly upon the dopamine receptors D_1 and D_2 and the adrenergic α_2 receptors.
DEXTRO-METHORPHAN	Robo, Skitties, Triple C,	chewable tablets, lozenges, syrups, capsules, dissolvable strips	Synthetic central NMDA(N-methyl D-aspartate) receptor antagonist

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Flag Signs of Drug Abuse

SWATI BHAVE[1], DONALD E. GREYDANUS[2]

From [1]Dr. D.Y. Patil Medical College, Pimpri and Dr. D.Y. Patil Vidyapeeth, Pune, Maharastra,

[2]Homer Stryker M.D. School of Medicine, Western Michigan University ,Kalamazoo, Michigan, United States of America

Correspondence to:Dr Swati Y Bhave Dr. D.Y. Patil Medical College, Pimpri and Dr. D.Y. Patil Vidyapeeth, Pune, Maharastra, India

sybhave@gmail.com

Parents and teachers have to be made aware about flag signs of drug use for early interventions. Adolescents with psychiatric issues or those coming from dysfunctional families and living in unsafe communities and schools are at higher risk. Clinicians should also be cautious when prescribing medicines that can lead to addiction and monitor them carefully. Parents should be aware of the problems of sports doping and caution and monitor teens wanting to bulk up body.

Key words: *Flag signs*, *Drug use*

Adolescents are particularly susceptible to involvement in substance use due to *the still developing* state of the adolescent brain, which can lead to reduced decision-making ability and increased long-term effects of drugs and alcohol. Understanding the causes of adolescent substance abuse is vital for successful prevention and intervention programs.

The developing adolescent brain has a preponderance of the hypothalamic limbic system and a very strongly developed dopamine pathway and a less developed prefrontal cortical control. This leads to impulsive high risk taking behaviour and susceptibility to negative peer pressure in adolescents [1]. Adolescents due to above reasons are very vulnerable to substance abuse which begins with experimentation with peers.

There are many risk factors that make some adolescents more vulnerable than others. Adolescent with various psychiatric disorders have a high risk of turning to substance abuse. Feelings of sadness and pain experienced during depression may lead adolescents to seek relief in the form of substance use [2]. Other factors are : 1) familial-childhood maltreatment (neglect and any type of abuse physical, mental, emotional, sexual). 2) Familial substance abuse, 3) dysfunctional parent-child relationships. Social risk factors include a) association with deviant peers, b) popularity, c) bullying, d) gang affiliation e) Unsafe and drug promoting environment in school and community. Individual risk factors include problems like ADHD and depression. Substance use among adolescents can lead to increased risk of transmission of sexually transmitted infections, vehicular fatalities, juvenile delinquency, and other problems associated with physical and mental health[3].

INVOLVEMENT OF PARENTS AND TEACHERS IN DRUG ABUSE PREVENTION

It is very important to have parent and teacher awareness programs in the community and in school and colleges to spread awareness of substance abuse. Learning flag signs will help to intervene early before addiction sets in. One important aspect of parenting is to make children and teens resilient- empowering them to learn coping skills for all adversities. Positive mental health is as important as good physical health [4]. Parents should encourage teens to undergo life skill training programs to reduce risk of drug addiction. [5]

The security given by unconditional love of parents - leads to good communication between parents and teens and ensures that teens come to parents for help when in trouble.

But very often teens may not clearly articulate what they are going through or may not feel like confiding in parents specially when they know they are doing something which will not be approved by parents. Fortunately, there are many signs and symptoms which are exhibited by adolescents when there is something going wrong in their life – these are called flag signs [6].There are some flag signs that should alert parents to observe their teen more carefully and try to communicate and get to the root of the problems – these may be termed as *Universal flag signs*. (Table 1)

TABLE 1 UNIVERSAL FLAG SIGNS

Domain	**Flag signs : these can alert parents that something is going wrong in their adolescent and needs professional assessment**
Sleep disturbances	excess sleep, reduced sleep, trouble falling asleep, getting up at midnight and not able to go back to sleep again, insomnia, nightmares
Appetite changes	eating too much, loss of appetite, binge eating, emotional eating, signs of eating disorders
Weight changes	weight gain, weight loss
Academic performance	losing interest in school work, falling back on home work, worsening academic performance, fights in schools, bullying or victim of bullying, reduced memory and attention span
Change in behaviour	withdrawal, signs of depression, not communicating, irritability, anger, fighting, emotional out bursts, mood swings, excess anxiety
Change in peer group	loss of friends, a new circle of friends, new friends with undesirable behaviours, unknown persons phone calls
Frequent physical symptoms	Various aches and pains – abdominal ,headache, chest pain
Regression	Thumb sucking , bed wetting , childish temper tantrums
Missing school	Frequently wanting to miss schools
Mobile phone behaviour	Need for extreme privacy, extreme anger, if phone taken away
Bathroom	Being closeted in the bathroom for prolonged hours

source : made by authors by compiling from references cited in the article

A single flag sign should not lead to panic but should alert parents.If there are many flag signs in adolescent, parents must – take professional help to assess what is wrong. Parents and teachers need to be educated and made aware of specific flag signs for various teenage issues like depression, risk of suicide, alcohol or tobacco consumption, substance abuse, emotional disturbance etc.

Parents also need to learn what to do and how to approach the situation when they discover flag signs in their children (Table2)

A UK consortium, including the Royal College of Paediatrics and Child Health, the Royal College of Psychiatrists, the Royal College of General Practitioners, and others, launched a new website, MindEd, funded by the Department of Health and aimed at any adult who is working with children, young people, and families[7]. It consists of free online information and education modules that support anyone interested in recognising what healthy behaviour and development is, how wellbeing can be supported, and which signs and symptoms need closer attention. In conjunction with the MindEd launch, a survey of 2105 adults in the UK revealed that 38% did not know which signs and symptoms they should look out for to assess children's mental health, and the majority of those who did were concerned to raise the issue in case they were mistaken. 39% of men surveyed believed that many children diagnosed with a mental illness were just showing bad behaviour. An educational website such as MindEd describes red flag signs in detail and should be read by every parent, teacher and health professional.

TABLE 2 GUIDANCE TO PARENTS

Indicators	Details	Common actions by parents	What should be done
Unexplained behaviour regarding finances	Not able to give an account of money given to them Continuously asking for more money without giving reasons The gifts given to them like i phone , tablet are not seen They are not able to explain where and how they misplaced or lost them	Give in and give more and more money because teen goes into tantrums or sulking or abusive behaviour Do not take the loss of items seriously and replace them	Sit with the teen and firmly tell that unless they are told what the money is needed for – money cannot be given Valuables lost should not be easily replaced
Missing articles and cash from home	Many times cash, valuable articles, electronic items, gadgets and jewellery may go missing from home.	Cannot believe that their teen can do such a thing. Will blame servants. Often removing them from work.	Don't be in denial As a family keep a close watch Try to catch the teen in the act Open a channel of communication and explain consequences of stealing like legal action. Keep a watch on credit card transactions
Excess ordering of stationary items like 1) eraser liquids 2) cough syrups 3) common pain massage ointments	Empty bottles or solutions used for erasing ink or paint will be found in the room of the teen	Parents are not aware of addiction to inhalants by sniffing or addiction to common cough medicines or OTC pain killers	Have a frank talk with the teen . Explain the adverse effects of addiction and take professional help
Lying about their activities	When leaving home not informing where they are going. On checking their whereabouts they are not at that friends home or location	Get angry and let it pass. Repeated shouting at them but no positive discipline of making them face consequences of negative behaviour by withdrawal of privileges	Open channels of communication and do active listening. Take professional help
Extreme mood swings	Parents need to educate themselves about normal teenage blues and pathological mood swings	Try to pacify when a negative mood and be nice when they are in a positive behaviour	Can be a indicator of psychiatric disorder like bipolar or Borderline personality disorder or psychosis or drug abuse. Professional assessment is a must
Truancy /missing school/cutting tuition classes / activity classes	Repeated complaints about absence from school or classes. No satisfactory answer about where they were and why they are missing out	Get angry and then let it pass. Repeated shouting and not practicing positive discipline	Take this very seriously contact peers , teachers etc Find out what is going on in the teens life Professional help and assessment is a must
New questionable peers	New friends. Not wanting to tell their names or introduce them	Let it go feeling .new interests new friend	Discuss the reasons for dropping old friends ask details of new friends

Source : made by authors by compiling from references cited in the article

SCHOOL AND COLLEGE BASED INTERVENTION PROGRAMS

School programs are a good way to deal with substance abuse in children and young people [8,9,10]. In countries like USA much is lost when a favourite sports or movie star promotes drugs-cannabis, alcohol, etc. Fortunately, in India advertisements promoting alcohol and tobacco in media and print media is banned but surrogate marketing with the alcohol brand marketing mineral water or soda continues

PARENTING PROGRAMS

It is important for parents to be attentive to signals and always make the adolescent feel that they have their unconditional love and will support and guide them through their turbulent times [11,12]. When parents notice general and specific flag signs (Table 3), they should try to talk it over with the adolescents. Sometimes only listening to them is all that is needed to bring them back on track. Parents need not react to everything. They should ask the teens if help is needed and do the needful. Overreacting and interference will make teens go away from parents making them afraid of confiding in them.

ADDICTION TO PRESCRIPTION DRUGS

After an operation, accident or severe chronic pain strong pain killer specially opoid group may be prescribed to adolescents. Clinicians should also be cautious when prescribing medicines that can lead to addiction and have monitoring systems in place for adolescents who have been prescribed such medicines. Table 4 details specific flag signs of drugs. Parents should also be made aware of the signs and monitor. A lot of adolescents may be prescribed drugs for medical conditions like ADHD, anxiety or depression and pain killers after surgery or accidents. Adolescents can also get addicted to cough medicines [13]. They may start abusing prescription drugs and hence parents should be on high alert when teen has been given prescription drugs.

Transition from nonmedical use of prescription drugs (NMUPD) to high risk behaviours including drug addiction is a tragic issue in youth of the 21st century[14,15].Management of acute and chronic pain is a challenging prospect for health care providers [16]. Addiction in adolescent as well as adult populations is on the rise. Opioids-related overdoses with many deaths have occurred in USA [17]. Details of commonly abused opiods are given in table 5.

TABLE 3 SIGNS AND SYMPOMS OF DRUG ABUSE

Specific signs of drug abuse	Finding the following: cigarette rolling papers, pipes, roach clips, small glass vials, plastic baggies, remnants of drugs, seeds, etc. needles, vials or pill packs in teen's trash Smell of marijuana on breath or body, Smell of tobacco or alcohol Unkempt look sloppiness in appearance, not wanting to take daily bath , wearing same dirty clothes, sniffing , runny nose, Bloodshot eyes, pupils larger or smaller than usual Thefts in house from parental wallets or purses, costly items missing from home, cheats, steals in school or community, always needs money, or has excessive amounts of money Negative, argumentative, paranoid or confused, fearful, destructive, anxious, verbal or physical abuse to family members and others Having memory lapses, having poor concentration Tremors, slurred speech, or impaired coordination, lack of motivation; appears lethargic or "spaced out", periods of unusual hyperactivity, agitation, giddiness Conflict with law : driving accidents under influence , fights and violent behaviour in public places or friends homes, relationships problems
Excess ordering of stationary items like eraser liquids or OTC medicines, cough syrups, common pain massage ointments	Teen will have having in his or her room- or thrown in trash too many empty bottles or solutions used for erasing ink or paint it is suspicious as the teen may have got addicted to sniffing Cough medicine missing from medicine cabinets Internet history on personal computer, laptop or smartphone showing visits to sites talking about cough medicine abuse or purchasing

TABLE 4 SPECIFIC SIGNS OF PRESCRIPTION AND OTHER DRUG ABUSE	
Type of drugs	**Signs and Symptoms**
Use of study drugs /stimulants E.g. Ritalin , Dexedrine	dilated pupils, dry mouth and nose, reduced appetite ,weight loss insomnia, excessive sleeping at odd times, may go for long time without eating or sleeping , agitation, anxiety, increased alertness, increased hear rate, increased body temperature , increased energy, hyperactivity, changes in mood, behaviour changes or aggression irritability, euphoria, paranoia, rapid speech, excessive talking followed by depression
Sedatives , anti anxiety agents, hypnotics E.g. Diazepam	contracted pupils, slurred speech, can appear drunk, clumsiness difficulties concentrating, poor judgement, drowsiness, slow breathing
Opoid pain killers E.g. Vicodin Oxycontin	drooping eyes, constricted pupils even in dim light,blurred vision light headedness, confusion , fear , headache, ringing in ears, nausea, vomiting, constipation, sudden itching or flushing ' slurred speech, drowsiness, seizures, difficulties concentrating, lack of energy and motivation, disinterested and neglecting social activities and friends, decline in school and home performance
Cough medicines E.g. Dextromethorphan , codeine	drunkenness, hallucinations and a sense of being separated from one's body and identity.
Marijuana	glassy red eyes, load talking, inappropriate laughter followed by sleepiness, loss of interest and motivation, weight gain or loss
Hallucinogens LSD, PCP	dilated pupils, bizarre and irrational behaviour including paranoia aggression , hallucinations ,mood swings, detachment from people absorption with self and other objects, slurred speech confusion
Cocaine, Crystal meth Inhalants – glue aerosol vapours	watery eyes, impaired vision, runny nose , rashes around nose and mouth, headache, nausea, impaired memory and thought , appearance of intoxication, poor muscle control, anxiety, irritability
Heroin	contracted pupils, needle marks , sleeping at unusual times sweating, vomiting, coughing, sniffling, twitching, loss of appetite
Ecstasy MDMA	dilated pupils, blurred or disturbed vision, heightened body temp that can prove lethal, heightened sensory perception and the tactile sense may be exaggerated, heightened level of physical energy sensations, nausea, dry mouth, sweating or chills, involuntary teeth clenching, muscles may cramp or are tense excited and energetic but confused, may seem overly alert for the circumstances.

TABLE 5 OPOID DRUGS		
Natural	***Semi-synthetic***	***Fully synthetic* opioids**
Morphine, codeine, thebaine	Include heroin, hydrocodone, hydromorphone, oxymorphone, oxycodone	Methadone, propoxyphene fentanyl(100 times more potent than morphine)

SPORTS DOPING

Parents should be aware of the problems of sports doping and caution and monitor teens that are into sports or wanting to bulk up body.(Table 6)

TABLE 6 WHEN TO SUSPECT SPORTS DOPING		
Type Of Drug	**Changes Seen**	**Side Effects**
androgenic anabolic steroids (AAS; nandrolone, stanozolol, danazol, others)	May gain considerable weight and strength.	Heightened aggressiveness, irritability, moodiness (mood swings; depression), violent tendencies, and suicidality A wide variety of medical effects: cardiovascular, hepatic, neuroendocrine
creatine that is an essential amino acid found in various foods It is popular with swimmers and other athletes	Phosphocreatine or creatine phosphate is found in the body, as for example in skeletal muscle and brain phosphates that are utilized for rapid expenditure of energy with potential reduced feeling of fatigue with exercise. The result can be up to 15% augmentation of high-intensity exercise (short-term, repetitive).	Weight gain, muscle strains, muscle cramps, dehydration (in hot/humid conditions), and gastrointestinal symptomatology (6-9). *serious problems* potential renal function degradation and hypertrophy of cardiac muscle

Being successful at sports may be the teenager's only or main way of getting out of poverty, finding peer acceptance and living a better life as an adult. Adolescent athletes will be told about various chemicals to enhance their sports prowess by coaches, peers, and even parents. Thus, parents and teachers should be educated by clinicians to warn young people to avoid such chemicals[18,19].Youth should understand that the best success in sports comes from proper nutrition and training along with genetics in which hopefully, they have inherited some sports skills from some of their parents or other family members[20].

Clinicians and teachers should become suspicious if there are sudden, unexplained sports success in a youth accompanied by unexplained changes in their personality or physique. Androgenic anabolic Steroids (AAS) are banned from International sports and youth should be taught to avoid them (Cabral). The side effects are many (Table6).

If an athlete shows recent weight gain and some sports improvement without clear explanation, one can suspect creatine supplementation. Unfortunately, its actual effect on sports performance for most athletes is unclear. In addition to the cost of creatine supplementation, the athlete also faces a number of adverse side effects (Table 6). Teen athletes should be discouraged from using sports doping agents and rely on nutrition and training to help them compete in the world of sports.

CONCLUSION

The developing adolescent brain has a preponderance of the hypothalamic limbic system and a very strongly developed dopamine pathway and a less developed prefrontal cortical control. This leads to impulsive high risk taking behaviour and susceptibility to drugs. It is very important to have parent and teacher awareness programs in the community and in school and colleges. Clinicians should also be cautious when prescribing medicines that can lead to addiction and have monitoring systems in place for adolescents who have been prescribed such medicines. Parents should be aware of the problems of sports doping and caution and monitor teens that are into sports or wanting to bulk up body.

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REVIEW ARTICLE

Office Management of Substance Use in Adolescents

NEEMA SITAPARA[1]

From[1]*Maa Sharda Child Care, Rajkot*

Correspondence to: Dr Neema Sitapara, Maa Sharda Child Care, Rajkot, Gujarat, India

sitapara.neema@gmail.com

Drug abuse is a social and medical problem. Only 20% of drug addicts seek help from professionals. Pediatricians play a key role in early detection and intervention. They should collaborate with deaddiction experts to ensure quality care for adolescents with substance use disorders. Prevention is the most effective intervention.

Key words : *Office management, Screening*

Managing an adolescent with drug abuse is challenging for a clinician. It requires high level of professional expertise and clinical skills. Pediatricians have a role in screening, giving anticipatory guidance, in parental counseling, management and rehabilitation of adolescents with substance use disorders (SUD).

While making a plan of treatment, following factors need to be considered:

Cultural and family background of the adolescent

Gender and relationship within family, school, community and with peer

Level of psychological maturity, strengths and weaknesses

Other medical and physical issues

KEY ISSUES IN MANAGEMENT

The cardinal points of management of adolescents with SUD are [1]:

Early detection and intervention ensures better outcome

Management demands a holistic approach of helping the whole person and not just the symptom.

Co morbidities like anxiety, depression and conduct problems should be adequately assessed and managed.

Domestic violence and child abuse makes adolescent vulnerable to drug use and should be screened for

Adolescents with SUD are prone to other high risk behaviors like unprotected sex, body piercing, tattooing, sharing needles, all being the leading causes of blood borne infections like HIV, Hepatitis B and C. Education, prevention, screening and treatment of these becomes a major part of treatment.

It is necessary for the treating agency to be aware about the legal interventions

Family influences the adolescent's compliance and completion of the treatment

Adverse social circumstances can trigger drug use and relapse

Compliance and long term follow up are the determinants of a positive outcome.

A strong support by family, school counselors, mentors and community members along with an empathetic attitude of the treating physician ensure success in management of SUD

The American Society of Addiction Medicine (ASAM) considers the duration of treatment and its intensity based on six cardinal areas that takes into account the level of intoxication, associated medical conditions, and concurrent emotional and behavioral issues, level of motivation, relapse risk and nurturing environment as factors that promote recovery.

NON PHARMACOLOGICAL APPROACHES

Non pharmacological approaches are usually practiced by psychologists, psychiatrists, counselors and support groups. The basic principle is to kindle a motivational insight, learn constructive ways to handle craving, strengthen assertive skills to resist peer pressure, improve interpersonal and intrapersonal communications [2]. A few of these approaches are enumerated below:

Adolescent Community Reinforcement Approach (A-CRA) emphasizes on establishing and maintaining abstinence by healthy family and social relationships. Educational and extracurricular activities are conducted to reinforce drug free behavior.

Cognitive-Behavioral Therapy (CBT) focuses on recognizing the unhealthy associations between thoughts, feelings, behaviors, identifying the maladaptive thoughts and enabling a healthy response pattern by developing emotionally mature and self-controlled thinking, feeling and acting pattern.

Contingency Management (CM) in which the client is helped by substituting reinforcement gained from the drug use by healthy options

Motivational Enhancement Therapy (MET) is motivational interviewing that resolves the ambivalent attitude of the participant. It helps the client develop a wish and willingness for abstinence.

Twelve-Step Facilitation Therapy is adopted by self-help groups like Alcoholics Anonymous (AA) or Narcotics Anonymous (NA). This therapy details the consequences of the

disease, its uncontrollable aspect and the unmanageable effects on life. It convinces adolescents to give up drugs with the support of recovering addicts.

FAMILY-BASED APPROACHES

The family based approach aims at resolving family conflicts and dysfunctional behavior patterns. It also aims at improving behavior and connections at work and school. These are Brief Strategic Family Therapy, Family Behavior Therapy, Functional Family Therapy and Multidimensional Family Therapy[3].

MEDICATIONS

FDA has not approved most medications for adolescents that are used in treating adults with SUD. They are however sometimes used 'off-label'. The basis of action of these drugs can be to either by rendering certain drugs harmless to user by chemically binding with the illicit drug, by preventing transmission to the central nervous system or by the antigen -antibody mechanism. Buprenorphine and methadone are used as replacement medicines. Disulfiram and naltrexone are used as antagonists. However, for adolescents, the mainstay of treatment is non pharmacological therapies, until approved newer and safer drugs become available [4].

THE ROLE OF THE PEDIATRICIAN

Pediatricians have a role to play in primary prevention of SUD in office practice, in diagnosis, management and rehabilitation and taking a lead in community programs to prevent and treat drug abuse. Pediatricians should partner with parents and guide them regarding prevention amd management of SUD by nurturing strong connections with their teens.

In 2016, Screening Brief Intervention Referral to Treatment (SBIRT) model was endorsed by American Academy of Pediatricians. This is simple to replicate in Indian context too, while managing substance use in adolescence[5]

Screening and severity of drug use (SUD): All teenagers approaching health care services for any reason are screened with a simple question:[5]

"In the past year, how many times have you used tobacco? Alcohol? Marijuana?"

If the answer is Never' it indicates *no substance use*

If the answer is 'Once or twice', it indicates *no substance use disorder(NO SUD)*

If the answer is 'Monthly', it indicates *mild/ moderate SUD*

If the answer is 'Weekly' indicates *severe SUD*

Management

Management of SUD depends on the staging and is outlined below [6]:

1. No substance use: Pediatricians should give positive reinforcement, encourage being 'drug free' and discuss the risks of drug use and skills to withstand negative peer pressure.

2. No SUD: Pediatrician should give brief advice regarding consequences of drug use. Discuss and deal with 'stressors' that trigger drug usage and reduce other risky behavior.

3. Mild / moderate SUD: Here the pediatrician should give motivational intervention. This is based on the principles of expressing empathy, developing discrepancy between life goals and the need to use drugs which could be stumbling blocks towards reaching the goals, enhancing self-efficacy to resist drug use and rolling with resistance; if the adolescent refuses to get motivated to decrease/ stop drug use. A request to sign a contract of life is made.CRAFFT questionnaire is used to identify adolescents with a serious problem of substance use, who need an in depth assessment of staging and motivation level.

4. Severe SUD: Pediatrician should refer such cases to an adolescent friendly psychiatrist for cognitive behavior therapy, motivational intervention, family therapy and pharmacotherapy.

CRAFFT Screening Tool for Adolescent Substance Abuse [7, 8, 9]:

It consists of answering simple questions given below as yes or no.

Part A

During the PAST 12 MONTHS, did you: 1. Drink any alcohol (more than a few sips)? (Do not count sips of alcohol taken during family or religious events.) 2. Smoke any marijuana or hashish? 3. Use anything else to get high? ("anything else" includes illegal drugs, over the counter and prescription drugs, and things that you sniff or "huff")

Part B: CRAFFT

1. Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?

2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?

3. Do you ever use alcohol or drugs while you are by yourself, or ALONE?

4. Do you ever FORGET things you did while using alcohol or drugs?

5. Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?

6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?

CRAFFT Scoring and Interpretation:

Part A: If "yes" to any questions in Part A, ask all 6 CRAFFT questions. If "no" ask CAR question, then stop.

Part B: Score 1 point for each "YES" answer.

CRAFFT Score gives the degree of problem related to alcohol or other substance abuse and suggested Action :

0-1 No problems reported. None at this time.

2+ Potential of a significant problem. Consultation Required.

ALLIED THERAPIES

Clinical hypnosis helps in holistic mind –body healing. It addresses deeper emotional issues and traumas causing and maintaining the addiction. It raises the self-confidence and self-esteem thereby improving the treatment compliance and

outcome. Relapses are also reduced by this therapy.

Meditation and spiritual therapies raise the consciousness to higher level with re awakening of purpose of human life. Soul consciousness and spiritual repletion helps to deal with pain and sorrows in a constructive way with eternal bliss and joy independent of outer sources or circumstances.

CONCLUSION

Pediatricians should screen adolescents for drug use in routine primary care visits. Non pharmacological therapies and family based approaches form the cornerstone of therapy for adolescents with mild and moderate SUD. Those with severe SUD require management by a multidisciplinary team led by a deaddiction expert. Early intervention in cases of adolescent SUD improves outcome.

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REVIEW ARTICLE

Prevention of Substance Abuse- Role of Paediatricians

DEEPA C PATEL[1]

From [1]Mrudul children and adolescent clinic, Surat, Gujarat

Correspondence to: Dr. Deepa C. Patel, Mrudul children and adolescent clinic, Surat, Gujarat, India

drdcpatel70@gmail.com

Primary care paediatrician plays an important role in identifying substance abuse in adolescents and in its primary prevention. Adolescents should be screened for substance use during routine and acute care visits. Paediatricians have a vital role in prevention of substance use at the school, family and community level.

Keywords : *prevention, screening*

Substance use disorder is a 'medico-socio-economic disease' with a high mortality and morbidity. Substance abuse in most cases has its onset in adolescence. It is known that 70% adults addicted to substances start drug use during teenage. It is the most commonly missed paediatric diagnosis. Substance use among adolescents ranges from experimentation to severe substance use disorders. All substance use including experimental use puts adolescents at risk of short-term problems such as accidents, fights, unsafe sexual activity and drug overdose. Adolescents are vulnerable to the effects of substance use and are at increased risk of developing long-term consequences such as HIV, hepatitis, endocarditis, mental health disorders, underachievement in school and substance use disorder [1,2]. Indian literature reveals that 63.6% of patients of substance abuse get initiated into drug use at less than15 years of age. Tobacco and alcohol are the most commonly abused drugs by Indian children and adolescents. Both are considered as the gateway substances. Preadolescents or adolescents who are casually involved in smoking tobacco or drinking alcohol are 65 times more likely to use marijuana than someone who abstains [3].Earlier the age of initiation, the greater the risk of serious health problems and addiction in the future. Few adolescents use “cocktail” or “combination” of drugs that are taken simultaneously through injection or taken one after another. Indian statistics on the substance use reveal that every year 20 million adolescents start using tobacco. Nearly 55,000 children and adolescents start drug use everyday [4, 5].

ROLE OF PAEDIATRICIAN

Primary care paediatrician may be the only health care professional to recognize the substance abuse problem in adolescents as it evolves. They can assist them as well as their families in treatment and prevention. Screening for substance use should be included in routine health care visits. Teenagers may receive considerable information about substance use from their peers and media. Research shows teenagers feel paediatricians are knowledgeable about substance use and they are open to having conversations about it when confidentiality is ensured [6]. In spite of rapid advances in field of treatment, the most cost effective solutions to the problem are still primary prevention and early intervention [7].

In office practice

Adolescents who come to health care facility either for routine check-up, vaccination or for an acute illness should be screened for substance use. Paediatrician can screen the patient for substance use, plan for further treatment, arrange referral when necessary and help the parents in rehabilitation. Universal screening helps in identifying substance use early.[2, 6]. Those who screen positive need further assessment determine level of risk [8, 9]. Screening Brief Intervention Referral to Treatment model has been discussed in the previous article by Sitpara N in this Journal. Figure 1 summarises this model.

If the adolescent is not using any drugs he/she should receive positive reinforcement for making this smart decision and related healthy choices for the future endeavours [10]. It was observed that even a few positive words from a physician may delay the initiation of alcohol use by adolescents. As drugs are neurotoxins, a delay in substance use initiation enables normal brain maturation. Choosing to abstain from substance use can be framed as an active decision and the adolescent is given credit for making a healthy decision and acting on it. Although screening has never been shown to increase rates of substance use, the National Institute on Alcoholism and Alcohol Abuse recommends including a 'normative correction' statement whenever screening children or younger adolescents such as, 'I am glad to hear that you, just like most others of your age, have never tried alcohol'. Normative correction statements may help to avoid the potential for patient misinterpretation that being screened for alcohol use implies that alcohol use at his or her age is expected and the age norm [5].

At school and community level

A school based programme for prevention of drug use reaches out simultaneously to a large number of students, parents and teachers. Current approaches to school based prevention of substance use can be categorized into three types: (a) social resistance skills training, (b) normative education and (c) competence enhancement skills training [5, 9].The main goal of social resistance skill is to increase awareness of adolescents regarding various social influences that support substance use and teaching them specific skills for effectively resisting both peer and media pressures to smoke, drink or use drugs. Normative education approaches include content and activities to correct erroneous perceptions regarding the high prevalence of substance use. Educating youth about actual rates of substance use, which

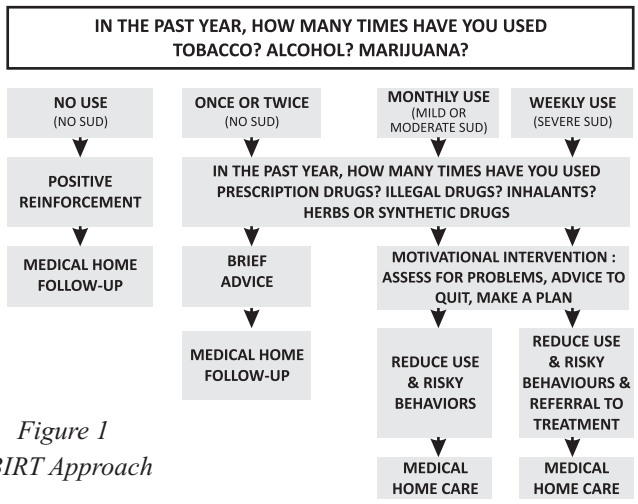

Figure 1
SBIRT Approach

The S2BI-based approach to clinical SBIRT. S Levy, L Shrier. 2014. Boston, MA: Boston Children's Hospital. Copyright 2014, Boston Children's Hospital.

are almost always lower than the perceived rates of use, can reduce perceptions regarding the social acceptability of drug use [5]. It also attempts to undermine inaccurate beliefs related to the social acceptability of drug use behaviour. Competence enhancement programs recognize that social learning processes are important in the development of drug use in adolescents. It focuses on teaching generic life skills. Some of them are (a) problem solving and decision making skills, (b) cognitive skills for resisting interpersonal or media influences, (c) skills for increasing self control and self esteem, and (d) adaptive coping strategies for relieving stress and anxiety [9, 10].

Health professional should sensitise teachers and school authorities about various risk factors of drug use in children and adolescents like aggressive behaviour, poor academic performance, learning difficulties, mental health problems and school dropouts. Teachers should be trained to increase academic and social competence of students for their all-round development as well to teach life skills to cope with stress and resist peer pressure. It is important to educate parents regarding early red flag sign of substance use, importance of loving and caring environment at home, healthy life style, sleep and media hygiene. It is very well documented that parental history of alcoholism and drug abuse, high levels of family conflict, lack of and/or inconsistent parental discipline put the adolescent at higher risk of substance abuse [11, 12].Sometimes advising the substance-using parent to seek assistance from a health professional may improve the success rate of a adolescent deaddiction program .

Community based prevention programs

Community based prevention programmes have been found to be beneficial in substance abuse prevention. Paediatricians can participate in community based prevention programs at different levels including family or parenting awareness programme, media campaigning and public policy initiatives. These interventions require a significant amount of resources and collaboration with stakeholders from all sectors of the community [5, 13-15].

CONCLUSION

Pediatricians have a major role in preventing drug use in adolescence. They should screen for drug use and give anticipatory guidance to parents and adolescents. Life skill training programs at school and community levels prevent drug use. Pediatricians should advocate for a drug free environment at all levels of care.

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Stress and Adolescence

Adolescent's viewpoint

"Most men lead lives of quiet desperation"
– Henry David Thoreau

This statement applies even today (probably now more than ever). In a world constantly driven by competition, people are being introduced to the rat race from a very young age. This causes a lot of pressure on us to excel in whatever we are made to do.

They say that pressure makes a diamond, but too much pressure can also cause the gem to turn to dust. In the same way, a bit of stress on us to get good grades, or to win the house cup or take part in the school elections may help us to do better, but too much stress can lead to depression and can have effects on our general health. The following anecdote is an example.

Rahul (name changed) was a bright boy. He was a class topper and was also the captain of his middle school football team. He had many friends and, in general, was an ideal student. But when he entered high school, all this changed. 8th grade began very well, with Rahul being elected class president and 8th grade representative to school cabinet, emerging as topper in their 1st quarterly examinations. On the field, he led his team to the state level and if they won the next match, scheduled in late August, he and his team would represent their state in nationals. His representative meetings were scheduled to begin in early September. However, due to unforeseen reasons, the match was rescheduled to mid-September (12 days before his midterms and 2 days before his 8th grade status report to the school cabinet was due). Due to this, he spent most of his time either researching old report formats or on the field, discussing and practicing tactics. This gave him very little time to revise for his midterms or just relax with his friends. The very game he loved was putting pressure on him and this pressure was taking its toll on him. He began to argue with his friends for petty reasons, lose most of his sleep and, in the few hours that he slept, have various nightmares weave through his brain. By the end of September, he had managed to mess up all his exams, lose the state championship by a small margin of one goal and instead of a statistic report; he had sent a long list of football tactics to the school cabinet by mistake. He lost most of his friends and the once cheerful, bright eyed boy grew lonely, unattached and depressed. As seen in Rahul's case, one of the main effects of poor coping with stress is –Depression.

Poor coping with stress may also lead to physical and emotional harm. For example: If a person is under a lot of stress and pressure, he/she may spend a lot of time on doing the thing which they believe will relieve them of this burden. During exams, a few of my friends get stressed to score cent-percent that they skip meals and even stay awake for long hours (almost up to 2 or 3 am) and get up early to revise again, even if they know that if they hadn't spent the past night reading while sacrificing food and sleep, they would have scored a solid 80-85%. As a result, on the day of the exam, they lose focus and are unable to write well. By the end of the exams they are dead tired and the average percentage comes down to 60-65%. This takes a toll on their physical health and also causes a negative effect on their academic performance.

Coming to emotional aspect, people who are stressed may be irritable, short- tempered, depressed or generally burnt out. If we take the above listed example into consideration, students tend to have more arguments, get into more fights and even burst into tears at the smallest mention of the most random things nearing exams.

However, stress need not always be related to academics. Different people have different stressors depending on what is important to them. As seen in the example of Rahul, sports, representing a class, school, district or even a state, or sometimes, the mere prospect of the fact that what you do impacts a large number of people, can cause a lot of stress.

Studies show that suicide among people aged 13-21 years has increased drastically over the last 10 years and has reached alarming rates. The main cause for suicide has been listed as stress. This being said, it can be derived that stress has reached shocking rates and measures need to be taken for the same. Some common ways to manage stress are:

Channel the stress into doing something creative or helpful.

Create a diversion.

Plan what the next step will be without stress.

Take 3 deep breaths, close your eyes and count to 10.

Write down what stresses you and look at it from a different perspective.

Close your eyes and think of the best possible solution in your situation.

Take a break and relax

In conclusion, "master stress, but never let it master you".

THANEESHA KARANTH
13 years old student

Adolescent Health Expert's Viewpoint

'Stress' is often used to mention aches and agonies of life. In fact, optimum amount of stress is essential for our existence, growth, frustration tolerance and ability to take new challenges. Imagine a student having no stress at all. Such a teenager will not put any efforts to excel and learn new skills. Naturally his / her natural energy and talents will be wasted and this dormant energy will be diverted towards leisure activities and erratic high risk behaviors.

In contrast to this, a student with extremely high levels of pressure is likely to get confused, mentally blocked and uncomfortable during stressful situations. Thus optimum stress is essential for the best outcome in a challenging situation (See Figure 1). It further enhances the ability to find newer solutions and possibilities. The net result gives the proud feeling of accomplishment. The art is in regularly assessing the current stress level and maintaining optimum stress (eustress).

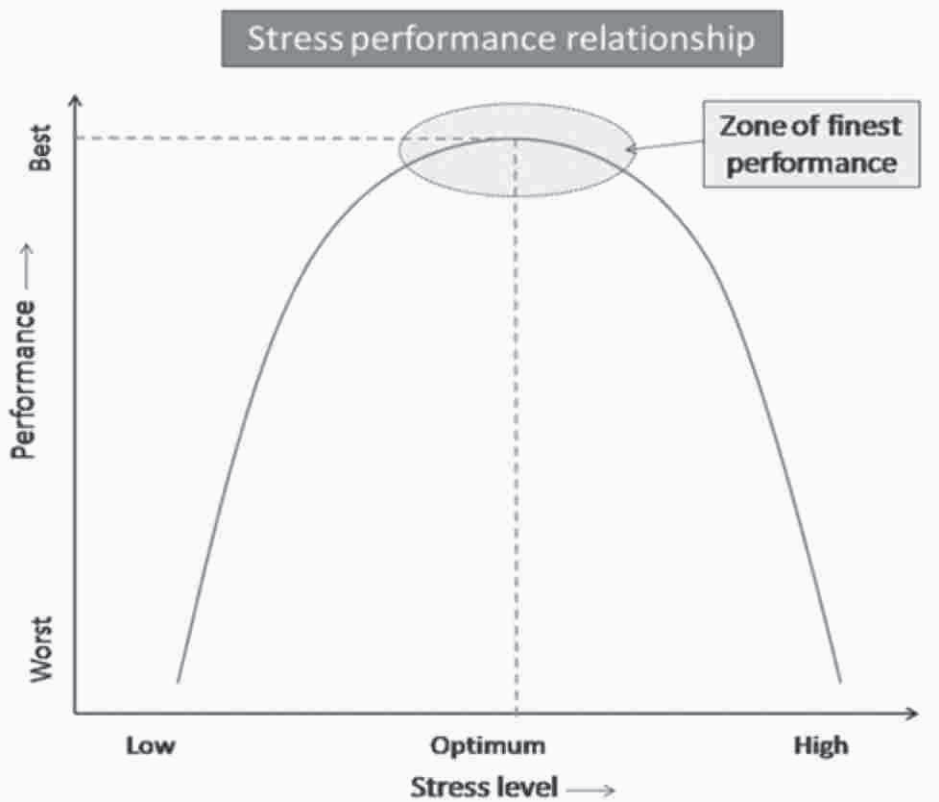

Figure 1: Yerkes Dodson Curve

TABLE 1: FACTORS CAUSING STRESS IN ADOLESCENCE

Individual factors	Family and school related factors	Miscellaneous factors
• Poor self esteem. • Lack of life skills. • Innate ego of a teenager delaying disclosure of the problem. • Mental health disorders. • Drug abuse. • Sexual identity confusion. • Ambitions disproportionate to one's capacities. • Sexual abuse and violence.	• Disrupted family environment. • Alcoholism and domestic violence. • Financial restrains. • Major illnesses. • Bullying in school. • Favoritism and humiliation by teachers. • Peer rejection. • Poor connectedness with home and school.	• Social stigma for mental health problems. • Tendency to hide initially. • Inadequate number of mental health professionals. • Lethrgy amongst policy makers and lack of political will. • Unbearable societal adversities like corruption, pollution etc. • Cyber harassment.

At times, an adversity like mishap in the family, humiliation by teachers or bullying by peers can adversely affect a normally performing student. In another situation, multiple impending tasks with emotional chaos raises the stress level beyond a critical level affecting peace and performance. Stress has multiple and many times interweaved causes. These causes could be inadequate life skills, diminished resilience or a mental health disorder like anxiety or depression. Stress could also affect the teenager owing to external factors like financial burden, academic overload (backlog) or peer rejection.

Various factors which commonly worsen mental wellbeing of a teenager are displayed in Table 1. Symptoms and signs of distress in adolescents are shown in figure 2.

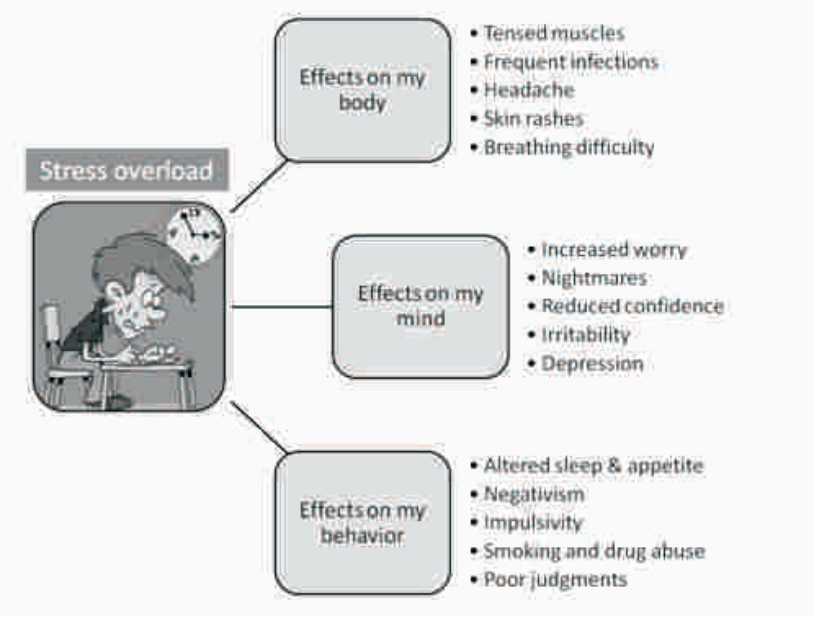

Figure 2: Symptoms and Signs of Distress in Adolescents

Many times it is not stress but irrational thinking and feeling (triggered by an adversity), that results in inappropriate behaviors.

For example, if Neha is being harassed by a "predator" on her mobile, she can have following triads.

Healthy triad: She thinks, "This is a difficult situation and I **wish** to be out of this because my safety is my prime responsibility". She feels **annoyed** at the predator since she has been victimized for no fault of hers. She is also **concerned** about her safety. The consequent behavior is likely to be **sharing** her problem with parents, **taking help** from cyber crime authorities and **being careful** not to share personal information on social media in future.

Unhealthy triad: She thinks, "This is **terrible** and I can't take it." She feels **pitiful, irritable and blames herself** for all her misdeeds. She becomes **lonely** and gets **depressed**. The consequent behavior could be **yield to** the predator's demands, **drug abuse, truancy** or **suicidal attempt**.

Ways to tackle adolescent stress

The most effective strategies for managing stress are similar to those for enhancing resilience. Resilience is the ability to bounce back from adverse situations. Various mechanisms that enhance resilience in children and teenagers are as follows.

Social and emotional learning**:** The five components of this theory are,

a) Self-awareness (identifying emotions, knowing personal preferences. Being aware of one's weaknesses and strengths and maintaining self-confidence and self-esteem).

b) Self management (handling stress by regulating emotions, impulse control, setting and monitoring progress towards goal attainment and appropriate expression of emotions).

c) Social awareness (ability to empathize and accept individual differences).

d) Relationship skills (cooperating with group or individual activities, resolving conflicts in a mutually agreeable way, seeking help if needed).

e) Decision making (making appropriate decisions using critical thinking and problem solving skills with ethics and socioeconomic norms).

Many researchers have concluded that this theory enhances academic performance, improves behavioral problems and emotional distress in teenagers.

Cognitive behavioral approach**:** This is based on ways to change the triad of thinking, feeling and behaving so that adolescents are not affected out of proportion by adversities. It is the belief system that decides one's reaction to such adversities. E.g. two teenagers may receive similar grades but may have totally different reactions. An emotionally disturbed teenager is likely to get accentuated reactions due to self downing, self sabotaging, illogical beliefs that lead to a defective triad of thinking, feeling and behaving. Through this approach which is mainly based on 'disputation' of irrational beliefs,the counselor can make a teenager understand the faulty link, identify the self talk of the teenager, dispute the irrational beliefs and bring out an effective new thinking process which gives optimum reaction to adversities. This approach works well for anxiety and depression.

Positive psychology**:** This approach emphasizes the development of positive mental wellbeing with less emphasis on mental abnormalities. Thus it focuses on the study of conditions and processes which contribute to optimum functioning.

Mindfulness approaches**:** These approaches comprise of paying attention in a particular way: on purpose, in the present moment and non-judgmentally. By connecting with the present moment and calmly observing thoughts, feelings and sensations, one can increase self-awareness and improve the capacity to manage thoughts and emotions. This can be achieved through meditation, contemplation exercises or through paying attention to one's everyday activities such as eating, gardening, walking, listening and class work.

Figure 3: Stress Management Techniques

TABLE 2: MALADAPTIVE WAYS OF COPING WITH STRESS

Avoidance	Remaining detached	Smoking, drugs or alcohol
Wishful thinking	Bargaining with 'Superpower'	Blaming others
Procrastination	Harm to others	Harm to self

Following stress management techniques can be taught to adolescents as shown in Figure 3:

1. Identify the stressor/s**:** An adversity could be internal i.e. arising from within (e.g. lack of skills, tendency to procrastinate, short cuts to pleasure, negative self talk, being inconsistent or even a drug habit) or external (disturbed family milieu, peer pressure, media overuse, break up in relationships, going away from home, bullying, academic burden etc). At times there can be multiple stressors working hand in hand.

2. Time management**:** This should be taught to a growing child through proper discipline methods. A difficult task can be broken down into manageable small segments and over a period the task may not appear so difficult. Consistency and family cooperation is a must.

3. Positive thinking**:** Rational coping statements and positive visualization can help a teenager feel confident. Saying," I have to do it, I can do it, so I will do it and I may succeed" makes one feel good. Putting up motivational posters in teenager's study room may be helpful. These are useful for managing any adversity like drug habit, sexual experimentation, academic backlog, academic under achievement, tendency to procrastinate and break up.

4. Behavior modification**:** Working on irrational beliefs, being realistic, disputing the self- downing thoughts, avoiding temptations and making persistent efforts are likely to take the teenager towards desired goal. Each step achieved, leads to reduction in stress level and enhanced confidence.

5. Relaxation techniques**:** Proper diet, adequate sleep, deep breathing exercises, yoga, mindfulness and meditation have been proven to be useful in stress reduction. A trained teacher should be approached for training and initial supervision. Again, consistency is the key. In extreme cases, medication after consulting a pediatrician or psychiatrist may be needed.

Adolescents and even adults choose faulty ways of handling stressful situations. Instead of applying life skills and facing the issues many engage in following inappropriate and many times harmful shortcuts for stress relief. The faulty ways are enumerated in Table 2:

Stress is omnipresent and affects each one of us. The frequency, severity and individual methods for handling it may vary. It is not the stress but one's capacities and skills to handle stressful situation that decide the consequences. Some factors which can ease out adolescent stress are family, school and peer support, life skills education, encouragement to open up, individual belief in religious and cultural norms, rational and realistic goal setting and availability of help and counselling.

ATUL KANIKAR
Nasik, Maharashtra
akanikar@gmail.com

Anorexia Nervosa: A Missed Diagnosis

JAINY NELLICKAL JOSE[1], CHITRA DINAKAR[1], RANJINI SRINIVASAN[1], SUSHMA KRISHNA[1], AMITH AHMED[1] AND JINCY JOSEPH[1]

From [1]Department of Paediatrics, St Johns Medical College Hospital, Karnataka
Correspondence: Dr Chitra Dinakar, Professor, Department of Paediatrics, St Johns Medical College Hospital, Bangalore-560034, Karnataka.
chitra_dinakar@hotmail.com

Background : Eating disorders in adolescence can present as thinness and food refusal. **Case characteristics:** 14 year old girl presented with low mood, decreased eating and weight loss for 6 months. On examination she was underweight (wt. 23.7kg <3rd centile) and had severe thinness(BMI 10 kg/m^2 <3rd centile). She fulfilled criteria for anorexia nervosa (AN), major depression and obsessive compulsive disorder (OCD). She was admitted and mixed method counselling with pharmacotherapy was used with a favourable outcome. **Message:** Late presentation and delay in diagnosis of anorexia nervosa increases the risk of complications and results in a poor prognosis. Adolescents with food refusal should be screened for eating disorders.

Key words : *Anorexia nervosa, food refusal*

Eating disorders continue to be under diagnosed in India [1].The lifetime prevalence of anorexia nervosa (AN) is between 0.5% to 2% [2], with a peak age of onset of 13 to 18 years [3]. Anorexia nervosa has a mortality rate of at least 5% to 6%,the highest mortality rate of any psychiatric illness [4, 5].The DSM 5 criteria for AN include refusal to maintain body weight at a minimally normal weight for age and height, fear of gaining weight even though underweight and disturbed perception of body weight [6]. The diagnosis of AN can be missed due to confounding co-morbidities like depression and anxiety which also pose management challenges [7,8,9].

CASE DESCRIPTION

A14-year-old girl studying in the 8th standard, presented with a history of decreased food intake,weight loss of 15 kg (38Kg to 23Kg) over the past 6 months and amenorrhoea for 4 months. Though severely emaciated, she felt that she was fat. She had not eaten solid food for 2 months. Her diet consisted of mainly fruit juice/coca cola around 100-200ml per day.She was passing urine once in 2 to 3 days and hard stools once in 10 to 12 days.

She showed irritability when forced to take food. There was history of 2 episodes of attempted deliberate self-harm when she used a knife to slash her wrists on being cajoled to eat. She had persistent low mood and ritualistic behaviour like spitting and hand washing.

Patient is the third child born to her father from his second marriage.The first wife had a pregnancy loss following which she had to undergo hysterectomy. The teen's father then married his first wife's sister and has 3 children. Her primary caretaker since early childhood is her stepmother, who was extremely anxious and over bearing towards her.

The adolescent was a perfectionist with a good academic performance (80-90% marks).She stayed in a boarding school from the 3rd standard. She was sent back home since the last 5 months in view of reduced eating and poor interaction with peers and teachers.

She was evaluated in multiple hospitals. All investigations including complete blood count, liver function tests, renal function tests, multiple ultrasound scans of abdomen, CTscan and upper GI endoscopy were normal. There was no suspicion of a possible eating disorder like AN. She was given IV fluids, antibiotics and advice to improve food intake.

On examination, she was extremely emaciated with facial appearance of an old woman. Her weight was 23.7 kg (<3rd centile), Height 153.3cm (50th centile) and BMI 10kg/m2 (<3rd centile.). Her pulse rate was 96/min, Blood pressure100/70mmHg, Respiratory rate 20/min and temperature 98^{0}F. Her skin was dry and wrinkled.There was no pallor, lymphadenopathy or edema. Systemic examination was normal.

Her initial investigations showed haemoglobin 13.2gm/dl, WBC count 4680cells/mm^3 and platelet count1.86lakh/mm^3, creatinine 0.6mg/dL, S.urea 36.5mg/dL, serum sodium 149mEq/L(135-147mEq/L), serum potassium 4.4mEq/L(3.4-4.7mEq/L), calcium 9.9mg/dl(8.4-10.2mg/dL), phosphorous 4.07mg/dl(3.3-5.4mg/dL), S.TSH, liver enzymes and blood sugars were within normal limits. Urine examination showed ketonuria. Chest X-ray revealed a small tubular cardiac shadow. ECG was within normal limits.

The patient was diagnosed as anorexia nervosa, restrictive type with severe thinness,depression and OCD.She was advised admission but refused the same though her parents were willing. She had to be cajoled for admission over 3 hrs.

On day one of admission she consumed 225ml of milk and her urine output was 100ml/day. She required 30 to 40 minutes of daily counselling for negotiating increase in intake with incentive in the form of early discharge. Threats of IV fluid and Ryle's tube feeding were also effective.

Calorie increase was planned as 10-15% daily (100-200 calories), with target weight gain 1- 1.5 kg/week. Initially she preferred only green tea, milk and juice. She refused all solids till day 6

when she opted to eat biscuit and noodles.The dietary interventions with improvement in her clinical and mental parameters are tabulated in table1.

To prevent refeeding syndrome she received high dose thiamine at 100 mg/day initially for 2 weeks, then 10mg/day for 1 month, along with phosphorous (9 mg/kg/day), calcium, iron and multivitamins.

The adolescent underwent multiple sessions of counselling by mixed methods to bring about behavioural change and enhance eating. With increasing insight, she was counselled regarding the importance of healthy diet and optimum weight.She was started on risperidone (1 mg OD) on day 3 and escitalopram (2.5 mg OD) on day 8.

In Week 3, she developed minimal pedal edema with exertional dyspnoea due to refeeding syndrome with cardiac compromise. She had gained 4kg in the preceding week. ECG showed low voltage complexes and ECHO mild pericardial effusion. Electrolytes and phosphorous were normal. She improved with bed rest and gradual mobilization.

TABLE1: IMPROVEMENT IN PATIENT'S PHYSICAL AND PSYCHIATRIC CHARACTERISTICS DURING THE ADMISSION PERIOD

Characteristics	**Week1**	**Week2**	**Week3**	**Week 4**
Calorie intake per day	150-200 Kcal/day	420-550 Kcal/day	750-1300 Kcal/day	870-950 Kcal/day
Weight at the end of each week	24.5 Kg	26Kg	30.6Kg	31.2Kg
Urine Output	100-125 ml/day	190-240 ml/day	250-390 ml/day	430-590 ml/day
OCD*				
- frequent washing of hands	++	+	-	-
- continuous spitting	++	+	-	-
- repeated bathing	++	-	-	-
Thought				
- repetitive thoughts	++	+	+	-
Insight	Grade 1	Grade 1	Grade 3	Grade 5
Affect	Dull	Reactive	Reactive	Reactive
Psychomotor activity - Increased agitation / increased walking	++	+	+	absent

* Obsessive compulsive disorder

At discharge after 30 days her weight was 31.2kg (at 3rdcentile) and BMI was 13.24kg/m^2(3rdcentile). At 4 month followup her weight was 38kg and BMI 16.2kg/m2.

DISCUSSION

Our patient presented with classical symptoms but a missed diagnosis.There is a need for a high index of suspicion for any situation of food refusal.A screening questionnaire to assess attitudes to eating and eliciting history of fear of being overweight or perception of being fat will aid early diagnosis.

The patient's family structure and dynamics were dysfunctional. However, her parents were supportive and cooperative. Families are critical change agents in the recovery process in all forms of eating disorders.

Close attention to calorie intake, weight gain and laboratory parameters detect refeeding syndrome. The recommended weight gain is 1-1.3kg/week [7]. Refeeding syndrome can be defined as the potentially fatal shifts in fluids and electrolytes that may occur in malnourished patients receiving artificial refeeding. Hypophasphatemia is common. Early recognition reduces mortality.

Co-morbid psychiatric conditions are common in eating disorders [8,9]. Pharmacotherapy can cause prolonged QT. Treatment is started after initiating feeding with very low doses and gradual escalations.

Multiple mixed method counselling sessions of the patient and family by a multidisciplinary team including paediatrician, psychiatrist, psychologist and a dietician were effective.

Long term follow-up is necessary. In a 21 year follow up study by Stephen et al 50·6% had achieved a full recovery, 10·4% still met full diagnostic criteria for anorexia nervosa, 21% had partial recovery and 15·6% had died from causes related to anorexia nervosa [10].

We reiterate the need for a high index of suspicion for AN in any situation of food refusal. A multidisciplinary team approach helps reduce morbidity and mortality.

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Emergency Contraceptives

CHANDRIKA RAO[1] AND NIMRAT SANDHU[1]

From [1]Department of Paediatrics, MS Ramaiah Medical College, Bangalore, Karnataka
Correspondence: Dr Chandrika Rao, Professor, Department of Paediatrics,
MS Ramaiah Medical College, Bangalore, Karnataka, India.
chandrikadoc@gmail.com

Emergency contraceptives are indicated in adolescents as an 'emergency' birth control method after sexual assault or an unprotected intercourse or failure of 'routine' method of contraception. It does not protect against sexually transmitted infections or future pregnancies, when usual birth control methods are not used. It has few side effects and follow up visits are indicated in specific circumstances.

Key words: *emergency contraceptives, pregnancy*

Contraception is the deliberate use of artificial methods or other techniques to prevent pregnancy as a consequence of sexual intercourse. The major forms of artificial contraception are the barrier methods, the contraceptive pill and intrauterine devices and sterilisation.

EMERGENCY CONTRACEPTION

Emergency contraception (EC) refers to methods that can be used to prevent pregnancy after sexual intercourse. These are recommended for use within 5 days of the intercourse. They are more effective, if they are used soon after intercourse. EC can prevent up to over 95% of pregnancies when taken within 5 days after intercourse.

Intra Uterine device (IUD)s are considered the most effective form of EC. Oral regimens include Ulipristal acetate as the most effective oral regimen (ACOG 2017), levonorgestrel or combined oral contraceptives (COCs) consisting of ethinylestradiol plus levonorgestrel

INDICATIONS FOR EMERGENCY CONTRACEPTION

These include:

When no contraceptive has been used.

Sexual assault

When there is concern of possible contraceptive failure, from improper or incorrect use, such as [1]

- condom breakage, slippage, or incorrect use;
- 3 or more consecutively missed combined oral contraceptive pills;
- more than 3 hours late from the usual time of intake of the progestogen-only pill (minipill), or more than 27 hours after the previous pill;
- Dislodgment, breakage, tearing, or early removal of a diaphragm or cervical cap;
- Failed withdrawal
- Failure of a spermicide tablet or film to melt before intercourse;
- Miscalculation of the abstinence period, or
- Expulsion of an IUD or hormonal contraceptive implant.

MECHANISM OF ACTION

Oral emergency contraceptives work primarily by delaying ovulation. Copper intrauterine contraception inhibits fertilization by affecting sperm viability and function [2,3]. The copper device also has post fertilization contraceptive effects. The various postulated mechanisms depending on the phase of cycle are inhibition or delay of ovulation when used prior to ovulation, thickening of cervical mucus resulting in trapping of sperms, direct inhibition of fertilization, histological and biochemical alterations in the endometrium leading to impaired inhibition or delay of ovulation, alteration in the transport of egg, sperm, or embryo, interference with corpus luteum function and luteolysis [4,5].

Both oral and intrauterine emergency contraceptives are only effective before implantation. They are ineffective once implantation has occurred.

ORAL EMERGENCY CONTRACEPTION

The various oral emergency contraceptives are listed in Table 1

TABLE1: ORAL EMERGENCY CONTRACEPTIVES

Method	Dose	Timing of use after unprotected intercourse	Reported efficacy
Levonorgestrel	0.75 mg given twice, 12 hours apart or 1.5 mg given as a single dose	Up to 3 days (72 hours)	59 to 94 percent of pregnancies prevented
Estrogen plus progesterone (Yuzpe regimen)	100 to 120 micrograms ethinylestradiol plus 500 to 600 micrograms levonorgestrel in each dose, given twice, 12 hours apart	Up to 5 days (120 hours)	47 to 89 percent of pregnancies prevented
Mifepristone	Single 600 mg dose	Up to 5 days (120 hours)	99 to 100 percent
Copper intrauterine device	Inserted within 120 hours after intercourse	Up to 5 days (120 hours)	At least 99 percent
Ulipristal	Single oral dose of 30 mg	Up to 5 days (120 hours)	98 to 99 percent

Levonorgestrel (LNG) was associated with a lower rate of side effects, including nausea, vomiting, headache, and breast tenderness [4].

Antiprogestins namely ulipristal(UPA) and mifepristone act as antiprogestins are highly effective for emergency contraception [6]. Their primary mechanism of action is delay of ovulation. [7] A disadvantage of antiprogestins is that the delay in ovulation results in a delay in subsequent menses, which may provoke anxiety about possible pregnancy.

Mifepristone is as or more effective than other oral emergency contraceptives. The optimum dose has not been determined, but is probably 25 to 50 mg. In most series, mifepristone was associated with a low incidence of side effects. Gestrinone, a synthetic steroid with mixed progestogen and antiprogestogen effects, appears to be as effective as mifepristone.

COPPER INTRAUTERINE CONTRACEPTION

Copper intrauterine contraception (IUD) [2,3] is the most effective method of emergency contraception. Advantages of this method are that it provides continuing contraception after initial IUD placement, is more effective than oral regimens, especially in overweight/obese women, and is well tolerated, with one-year continuation rates of 60 percent. Copper IUDs are also highly cost effective when used for emergency contraception.

There is evidence in the professional literature that would support insertion of the Cu-IUD for EC in adolescents. A retrospective case review of emergency Cu-IUD use in 103 women aged 13–19 years found that the vast majority of insertions were straightforward; 96 insertions were rated as 'easy' or 'average' and only one insertion failed. Twenty-seven (26%) women had their device removed after their next menstrual period due to pain and bleeding and two because of partial expulsion.

Intrauterine contraception should be avoided in adolescents known to have current gonorrhea or chlamydial infection or found to have acute cervicitis during examination, because of the increased risk of pelvic inflammatory disease. In the absence of other medical contraindications, there is no contraindication to inserting the IUD on the same day that the patient presents for emergency contraception.

INVESTIGATIONAL DRUGS

Prostaglandin inhibitors (COX-1 and COX-2 inhibitors) appear to interfere with several essential steps in female reproduction, including oocyte maturation and ovulation. [8,9]. Use of these drugs for emergency contraception is investigational. Safety and efficacy data is awaited.

Meloxicam (15 mg) plus levonorgestrel (1.5 mg) resulted in a significantly higher proportion of cycles with no follicular rupture within five days than treatment with placebo plus levonorgestrel [10] .

SIDE EFFECTS

Side effects from the use of oral EC are nausea and vomiting, slight irregular vaginal bleeding and fatigue. Side effects are usually mild, and normally resolve without further medications.

If vomiting occurs within 2 hours of taking a dose, the dose should be repeated. ECPs with LNG or with UPA are preferable to combined oral contraceptives because they cause less nausea and vomiting. It is not recommended to take an antiemetic before taking EC.

Drugs used for emergency contraception and IUDs do not affect future fertility. [11,12].

EMERGENCY CONTRACEPTIVE PILLS IN INDIA

Below are the most common and highly selling emergency contraceptive pill brands in India.

1. I pill Emergency Contraceptive Pill: It contains the hormone levonorgestrol. The success rate of I pill is about 80-90%. It is priced at Rs.75/-

2. Unwanted 72: It is devoid of estrogen which generally makes it free from gastrointestinal upsets and nausea. It is priced Rs. 80/- for a single pill.

3. Preventol: This contraceptive pill is manufactured by Hill Life Care Ltd. and consists of two pills containing 0.75 mg of hormone levonorgestrol. First pill should be consumed as early as possible after unprotected sex and second pill should be taken 12hours after taking the first pill. It is priced Rs. 50/-

4. Truston 2: It is a pack of two tablets manufactured by V Care Pharma Ltd. First pill should be consumed soon after the unprotected sex, preferably within 24 hours and the second pill should be consumed after 12 hours. Price: These tablets cost Rs. 60/-.

5. Nextime pill: It should be consumed within 72 hours of unprotected sex and contains 1.5mg of levonorgestrol. Price: Rs. 49/-

6.Clr-72: It is a single pill oral contraceptive which should be consumed within 72 hrs of unprotected intercourse.Is manufactured by Vardhman Life care pvt.Ltd. It is priced for Rs.78/-

7. Tpill-72: It contains 1.5mg of levonorgestrol. Tpill 72 should be consumed in single dose within 72 hours of unprotected sex. The pill is priced for Rs. 69/-

8. No-will pill: The pill should be consumed within 24 hours of unprotected sex in a single dose. It is priced for Rs.75

PRESCRIBING EMERGENCY CONTRACEPTIVES IN CLINICAL PRACTICE

At the time of prescribing EC, the provider should follow the GATHER approach for counselling. Ensuring confidentiality and privacy is crucial for all counselling sessions.

G - Greet - Greet the client. Build a rapport with client by greeting the client and making her feel comfortable.

A - Ask - Ask questions effectively in a friendly manner using words that client understands and listen patiently, without being judgmental. Identify client needs by asking relevant questions about personal, social, family, medical and reproductive health including reproductive tract infections, sexually-transmitted diseases, family planning goals and past/ current use of family planning methods.

T - Tell - Tell the relevant information to help her make an

informed choice regarding method of EC and ongoing contraception method.

H - Help - Help the client to reach a decision and give other related information e.g. how to protect herself from STIs.

E - Explain - Explain about the method in detail including information that it protects against a 'single act', its efficacy, potential side-effects and the need for follow-up in case period is delayed by more than 7 days.

R - Return - Return for ongoing contraceptive method is advised and need for follow-up is emphasized if the period is delayed beyond 7 days.

The following protocol is carried out before prescription:

During history - taking, the focus is on the following points:

date of last menstrual period

average length of menstrual cycle

timing of all acts of unprotected intercourse in relation to the current cycle to calculate the risk of pregnancy

number of hours since the first episode of unprotected intercourse

current or recent use of contraception for planning future ongoing contraception

medical history relevant to EC use and to decide the chosen method of ongoing contraception including history of recent STI.

During examination, blood pressure check-up and assessment for anaemia is done. Pelvic examination is not mandatory except in cases of sexual assault.

Urine pregnancy test must be done if pregnancy is suspected.

Screening for sexually transmitted infections should be done in high risk cases.

FOLLOW-UP

Indications for immediate follow up include the following:

1. If the menstruation has been delayed for more than one week from the expected date
2. If there is lower abdominal pain and heavy bleeding
3. If the subsequent period is unusually light, heavy, short or absent.

Figure 1 summarises the clinical practice points for prescribing EC

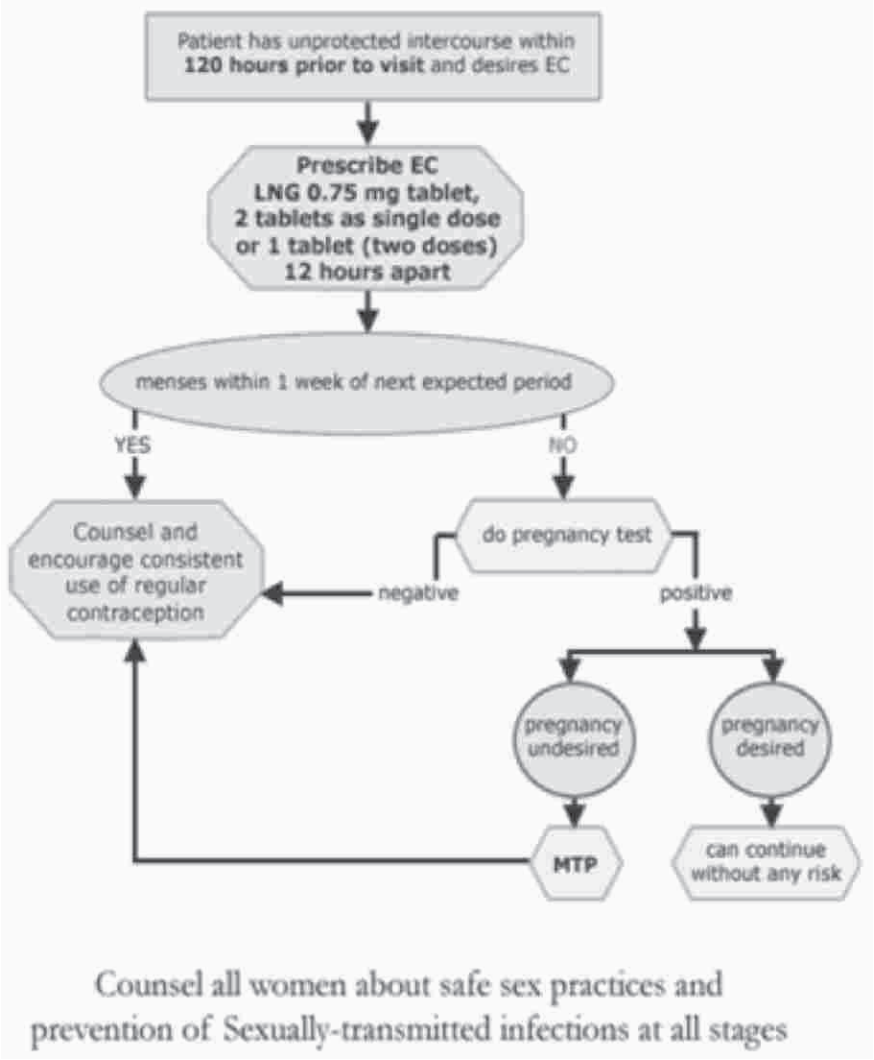

Figure1: Oral emergency contraceptives in practice
Source: India Specific website-ecindia.org

CONCLUSION

Emergency contraception is indicated for adolescents who have had recent unprotected intercourse (including sexual assault), or in those who have had a failure of another method of contraception (eg, broken condoms, or have been late for their depot-medroxyprogesterone injections). There are no medical contraindications to use of oral EC. It should be administered as soon as possible, but up to 120 hours, after an episode of unprotected intercourse.For women who choose hormonal emergency contraception, levonorgestrel is more effective and has fewer side effects than estrogen-progestin therapy. Women using emergency contraception pills should be advised that a risk of pregnancy still exists if they have unprotected sexual intercourse after emergency contraception pills have been taken. Adolescents in need of birth control, should begin regular use of nonemergency contraception, the day after emergency contraception administration.

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Predictors of future suicide attempt among adolescents with suicidal thoughts or non-suicidal self-harm: a population-based birth cohort study (*Lancet Psychiatry2019; 6: 327-337)*

Adolescent suicidal behaviour is a major public health concern. Suicidal thoughts and non- suicidal self- harm are predictors of suicidal attempts. Several associated factors determine future attempts in this high risk group. This was a longitudinal study on population based birth cohort from UK, including 456 adolescents with suicidal thoughts and 549 adolescents with non -suicidal self -harm at 16 years. Association between a wide range of prospective risk factors (sex, intelligence quotient, executive function, impulsivity, sensation seeking, personality traits, exposure to self-harm in others, life events, early adversity, body dissatisfaction, sleep problems, psychiatric disorders, hopelessness, symptoms of depression, substance use, suicidal plans, and non-suicidal self-harm characteristics) and future suicide attempts assessed at 21 years, using logistic regression analysis. Of 107 who reported suicidal thoughts and non-suicidal self- harm at 16 years, 22 (21%) attempted suicide by 21 years, while it was <1% in the participants who did not report suicidal thought or self- harm. 12% of participants with suicidal thoughts and 12 % with non-suicidal self-harm, reported attempt by 21 years of age. While most adolescents with suicidal thoughts or non -suicidal self -harm never made any attempt in future, the strongest predictors of attempt were, cannabis use, other illicit drug use, exposure to self-harm, personality traits and sleep problems indicating that screening for these factors will help clinicians to identify adolescent with potential risk for future attempts.

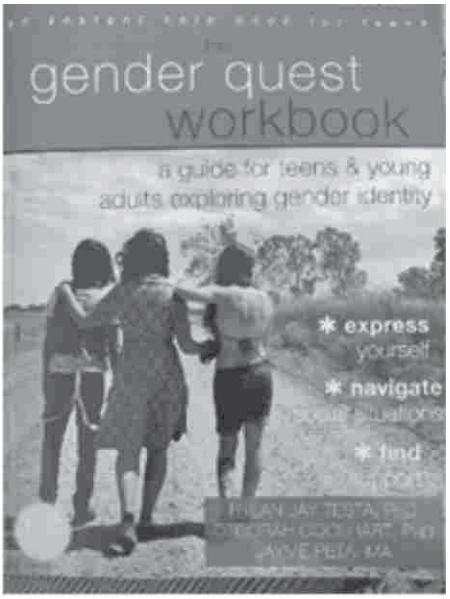
Mechanisms and Frequency of Violent Injuries among Victims and Perpetrators of Bullying (*J Adolesc Health. 2019;64: 664-670)*

Bullying is known to occur in amongst adolescent girls who are 'early bloomers'. The study examined whether early onset of menarche was associated with bullying victimisation and perpetration. The study was conducted in 35 European and North American countries. School bullying in the past 2 months was assessed using Revised Olweus Bully/Victim Questionnaire. Early menarche was defined as before 11 yrs of age and examined for association with bullying victimisation and perpetration using logistic regression. It was found that out of 227443 adolescent girls with mean age of 13, 4.45 % (10172) had early menarche. It was found that there was a positive association of early menarche with victimisation, adjusted odds ratio [aOR] [95% confidence interval [CI]=1.21 [1.12–1.31]; frequently: aOR [95% CI]=1.35 [1.22–1.50]) and perpetration, occasionally (aOR [95% CI]=1.19 [1.11–1.27]); frequently (aOR [95% CI]=1.46 [1.31–1.63]).). Hence need for including the early maturing girls in anti-bullying programs.

The Profundity of the Everyday: Family Routines in Adolescence Predict Development in Young Adulthood (J *Adol Health 2019; 64:340-346)*

This study was a prospective, longitudinal 6 year study on 504 Afro- American Adolescents and parents who were examined for long-term effects of family routine defined as predictable, repeated consistent patterns that characterise day to day home life on 4 predictable outcomes during adolescence namely alcohol use, emotional self- regulation, epinephrine and nor- epinephrine levels (biological markers of stress) and a 4 year university enrolment, representing , behavioural, psychological, physical and educational domains of adolescent development respectively. The present study is from a subsample of a longitudinal study of Afro-American families that began when their children were 11 years. These families were from communities in rural Georgia where poverty and unemployment was high. Out of 504 subjects 46 % income were below 100% and another 21 % between 100-150 % poverty level. Six waves of data obtained annually three at 16, 17, 18 years and three during young adulthood 19, 20, 21. It was found out that youth whose primary care givers reported family routines during adolescence (regularly eating together as family, consistent bedtime) reported less alcohol use, better emotional self -regulation, lower epinephrine and nor epinephrine levels and greater university enrolment. This was evident for all outcomes controlling for socioeconomic risk, sex and baseline measures at 16 years. For a subset of outcome family routines persisted even after taking into account factors like supportive parenting, harsh parenting and house hold chaos. Hence family routine is an important factor for long term adolescent development.

LATHA RAVINDRAN
larabha@gmail.com



THE GENDER QUEST WORKBOOK
A guide for teens and young adults exploring gender identity
Rylan Jay Testa PhD, Deborah Coolhart PhD, Jayme Peta MA
[Instant help books, an imprint of New Harbinger Publications, also available as an e- book] www.newharbinger.com

Here is a book that is put together so well, that the young person is taken through steps in the quest logically and empathetically. Each chapter introduces the next step through questions, exercises, experiments, chronicling, observation and inferences. It is an invaluable resource for teachers, clinicians and parents too. It is a road map in the wilderness for young persons of any gender to examine their own experiences and understanding of this core aspect of self.

There are 8 chapters on gender identity, gender expression, family, school and work, friends and peers, dating and sex, balancing multiple identities, dealing with the hard stuff. The cover says 'express yourself, navigate social situations, find support' and at the end of the 169 pages, the Quest workbook achieves all of the possibilities. A must-acquire book for all who want to address and 'undo gender brainwashing'.

SHUBHA BADAMI
sbadami@gmail.com

1. ADOLESCENT WITH HYPOGONADISM : NOT SO RARE IN A PEDIATRIC OPD

Nagashruthi M B

smile.shruthi93@gmail.com

INTRODUCTION : Testicular hypofunction during fetal life can be a component of some types of disorders of sexual development which can present as ambiguous genitalia at birth. As children do not produce significant testosterone, there are no discernible effects of hypofunction in them. In the pubertal age group, testicular hypofunction may lead to testosterone deficiency, infertility or both. Though the etiology may not be defined, the level of the lesion can be defined in a case of hypogonadism. Hypergonadotropic hypogonadism is one of the components of hypogonadism which can present with failure of development of secondary sexual characters like high pitched voice, low testicular volume or penile length, or long extremities.

CASE REPORT : A 12-year-old boy, second order child born to a non-consanguineous married couple at term gestation with uneventful perinatal period came with complaints of underdevelopment of the external genitalia which was noted since birth, and history of not gaining weight adequately. He was a known case of bilateral undescended testes, and underwent left orchidopexy at 6 years of age. He had no history of polyuria, polydipsia or headache, or history suggestive of hypothyroidism. No history of mumps, torsion or trauma to the genital area or exposure to radiation. On examination his height was 139.4 cm(<3rd centile),his weight was 25 kgs (3rd-10th centile) and BMI was 13.9 kg/m^2 (3rd- 10th centile). Vitals were normal, with no hyper/hypotension. Examination revealed absent axillary hair, stretched penile length of 4cm, and testicular volume of 2cc. He also had hypopigmented scrotum. Findings were suggestive of Tanner stage 1. A diagnosis of hypogonadism was made. Klinefelter and Noonan syndrome were considered;however clinical features were not suggestive of the above two. He was found to have normal hemoglobin and total counts, normal karyotype of 46 XY, bone age was normal. He had Serum TSH of 4.63 micro IU/ml (normal), free T4 of 13.38 pmol/L (normal), high FSH (109.8mIU/ml) and LH (44.06 mIU/ml) and low serum testosterone levels (<0.025ng/ml). Hence he was diagnosed as hypergonadotropic hypogonadism. Medical treatment of hypergonadotropic hypogonadism is based on the specific hormone abnormalities and their supplementation, in this case supplementation of testosterone. Work up for other endocrine abnormalities like diabetes and metabolic syndrome should be done. The issues of body image and sexuality should also be addressed and the adolescent should be counselled.

LEARNING POINTS : Any child with short/tall stature, overweight or underweight presenting to the Pediatric OPD, apart from the routine nutritional assessment and counseling, should also undergo assessment of secondary sexual characters. This is to ensure that cases like this are diagnosed on time to ensure appropriate management to prevent consequences on sexual health in the future.

2. ANOREXIA NERVOSA IN A 14-YEAR-OLD CHILDWITH REFEEDING SYNDROME

Ashby Joseph

ashjoazad@gmail.com

INTRODUCTION : We report the case of an adolescent girl with anorexia nervosa, who developed refeeding syndrome which was recognized and managed appropriately. There is a need for early recognition and timely appropriate management in order to prevent complications that may occur due to refeeding syndrome per se.

CASE REPORT : A14-year-old girl child was brought to our hospital for complaints of dieting that caused her to lose weight excessively. Her weight had come down from 70 kg to 39 kg in the last 6 months. Her diet consisted of ¼ cup of milk with oats in the morning with ½ chapatti and dhal for lunch and dinner. She denied vomiting/purging after food intake. She was also doing exercise for 2 hours daily for the past 6 months. She perceived herself as fat. Prior to this her friends used to tease her that she was fat and this caused her to start dieting. She had attained menarche at the age of 11 years with regular 25-day cycles with 5 days menstruation, but now she had amenorrhea for the past 6 months. She denied having any boyfriend or involvement in sexual activity. She was an only child of a non-consanguineous marriage, and was good in studies. She denied any symptoms of depression. There was no family history of eating disorder. Clinical examination revealed that her weight was 35 kg, height was 168 cm and BMI was 12.4 kg/m^2. She had bradycardia (heart rate45-48/min), and hypothermia (temperature 95-98^{o}F). Other systems were unremarkable. Initial blood investigations revealed her blood sugar levels were low. She also had low serum phosphate levels which fell further after initiation of re-feeding [1.5 1.3]. Her serum magnesium level which was low normal also fell below the normal value after initiation of feeding [2 1.5].Her ECG showed sinus bradycardia and echocardiogram revealed a structurally normal heart with ejection fraction of 35%.She was admitted in the PICU in view of her bradycardia, hypothermia, asymptomatic hypoglycemia and dyselectrolytemia. She was referred to the dietician for dietary advice and the child psychologist for counseling. During the course of gradual refeeding she developed refeeding syndrome with hypophosphatemia and hypomagnesaemia which was corrected by giving supplements. She was also given thiamine and other vitamin supplements. She gained 4.5 kg during her 2 weeks in the hospital. Post discharge she was on regular follow up with a general pediatrician and child psychologist. She was motivated and insightful and showed willingness to return to good eating habits following the counseling sessions.

LEARNING POINTS : DSM 5 eliminates the criterion requiring amenorrhea for the diagnosis of anorexia nervosa. Cautious reintroduction of feeding should be done in patients with anorexia nervosa, to minimize the risk of refeeding syndrome. Psychological intervention also plays a pivotal role in addressing anorexia nervosa.Serum electrolytes should be

monitored frequently and any abnormalities if detected should be treated promptly.

3. HIV AND THE ADOLESCENT : THE STORM BEFORE THE CALM

Dr. Nikith Austin D'Souza

nikith.souza@gmail.com

INTRODUCTION: This write-up is about adolescent HIV and the intricacies involved in the breaking of bad news.

CASE REPORT : A 17-year-old boy of a lower income family, whose mother died in infancy, spent his childhood and adolescence in boarding school. He presented with prolonged fever and general malaise for 2 months. There was headache, vomiting, blurring of vision and 2 episodes of melaena. No h/o significant weight loss, abdominal pain,other bleeding manifestations. There was no history of sexual activity, abuse, IV drug use. His father had remarried and lived with his second wife and daughter.His father and stepmother were negative for HIV. On examination he was thin (weight 35kgs, height 165cm, BMI 12.9 kg/m^2), had pallor, generalized lymphadenopathy, mild hepatomegaly, right eye papilledema, brisk DTRs, Babinski positive and terminal neck stiffness. Routine blood tests were normal except for persistently low sodium levels. There was no growth on Blood culture. Chest X-ray and Mantoux test were normal. HIV test was Positive and CD4 count was 114.5. MRI Brain revealed well-defined thin-walled ring-enhancing irregular lesions in the left lentiform nucleus, left parieto-occipital region and splenium of the corpus callosum, suggestive of abscesses. Toxoplasma IgG was Positive. He was diagnosed to have Stage 4 HIV infection with CNS Toxoplasmosis and raised ICP, Severe Immunodeficiency (CD4 count 114), and Hyponatremia secondary to SIADH. He was treated with mannitol and steroids, followed by HAART therapy for HIV, Pyrimethamine-Sulphadiazine for Toxoplasmosis, and oral salt supplements for SIADH. Disclosure of HIV Status had to be expedited as he was a reluctant patient demanding that his parents discontinue care and discharge from hospital. He refused IV fluids and oral tablets that worsened vomiting, and continuously complained about the pill count (16 pills a day). The CNS disease added to the poor coping as he had headache, raised ICP and hyponatremia. He threw temper tantrums and had sleep loss for 48 hours, adding to parents and physician's difficulties. He needed multiple one-on-one counselling sessions to reassure him about treatment options for HIV and need for adherence to ART.

LEARNING POINTS : 1. Be prepared for the storm*:* On breaking the news of the diagnosis, he went stormily through the Kubler Ross Model for grief – Denial, Anger, Bargaining, Depression and finally Acceptance over 2 weeks' time. 2. Ideally bad news is broken in stages, due to limited coping abilities*:* Example could be first disclosing about Toxoplasmosis, then about pill count and prolonged treatment and then only about HIV and implications with sexuality. In our situation a rapid sequence disclosure was done to avoid discharge against medical advice and loss of a precious life. 3. Adolescents require individualistic care and counseling to address their own understanding and attitudes towards disease*:* Intense counselling for the adolescent and family on a daily basis was essential to success in this case.

1. ASSESSMENT OF BONE HEALTH BY ULTRASO NOGRAPHY IN PERIPUBERTAL CHILDREN- STUDY FROM A TERTIARY CARE CENTRE, INDIA

Harshini T Reddy, Deepa C M, Jagdish Chinnappa

hachutr.n@gmail.com

BACKGROUND : The foundation for healthy bones is laid at a very young age. Studies estimate that bone quality is established in first two decades of life. Failure to achieve peak bone mass in associated with increased risk of osteoporosis and fractures in later stages of life. Bone health estimation in children can be performed using dual energy x-ray absorptiometry(DEXA), quantitative computed tomography(QCT) and quantitative ultrasound(QUS).QCT AND DEXA expose children to ionizing radiation which can be avoided by the emerging new technique QUS.

AIMS : Primary Objectives**:** To establish an age-dependent reference range for SOS(speed of sound) at the radius in children between 10 and 18 years old using ultrasound.To establish correlation of SOS at the radius with age, weight, height, and BMI.Secondary Objectives: To establish correlation of SOS at the radius before and after attaining puberty.

METHODS : Study Design: Cross sectional study (SAMPLE SIZE: 340: estimated using PASS software) Duration: 1 Year Methodology: Participants were selected from schools in the city of Bangalore aged between 10-18 years. All participants completed a questionnaire that evaluated lifestyle factors, diseases, and medications that affected skeletal development. The scan was performed on distal third of radius bone of dominant and non-dominant hand.5 minutes per child is the estimated total scan time including 2 minutes for scanning and 3 minutes for preparation. Paediatric software was used to analyze the resulting image which is provided by the manufacturer. Exclusion Criteria: children with chronic illness, skeletal and bone problems, long term medications (steroids, anticonvulsants), dietary supplements (calcium and vitamin D), fracture history. DEVICE: SUNLIGHT OMNISCENCE 7000P QUS DEVICE

RESULTS : Bone Density was measured for 340 children.4 children among them were excluded due to difficulty in locating bone by ultrasound probe because of soft tissue increase. Study population consisted of 336 children, 180 males and 156 females with an age range between 10-18 years. The speed of sound measurement data collected was analyzed and evaluated with respect to reference curves generated for various ethnicities. The data collected showed an increase in speed of sound with increase in age and the rate of increase is higher during puberty. The increase in SOS (speed of sound) values is similar to previous studies conducted to establish reference curves for pediatric population. Mean age of the population in this study was 13.75$\pm$2.364 years and mean SOS values are 3728.70 m/s for males and 3767.95m/s.

CONCLUSION: The data collected suggests a correlation between speed of sound and age group of subjects. Rate of increase in speed of sound is higher during ages of attaining puberty. QUS (quantitative ultrasound) can provide an easier and cheaper alternative to estimate bone mass in pediatric population.

2. SEXUAL ABUSE IN ADOLESCENTS

Chandrika Rao, Nimrat Sandhu

nimratsandhu@yahoo.com

INTRODUCTION : According to WHO, Sexual abuse is defined as any sexual behaviour or action toward a child that is unwanted or exploitative.Legal definitions distinguish between sexual abuse and assault by stating that former is committed by a caregiver or a household member and latter being committed with a non custodial relationship.According to study (GOI-2007)about one in 10 children will be sexually abused before their 18th birthday out of which one in seven are girls and one in 25 are boys. Bengaluru, Karnataka accounted for 26.76% of the total child rapes reported in the year 2012.

AIMS AND OBJECTIVES : To study the sociodemographic factors that influence sexual abuse and morbidity in adolescents. To analyse the working pattern of multidisciplinary approach in cases of child sexual abuse.

METHODOLOGY : This was a retrospective study done in Cases referred to M.S.Ramaiah Hospital, Bangalore. between November 2016- August 2018All cases were made Medico legal cases. Written and informed consent taken for history, examination and relevant investigations from parents and children more than 12 years. History and examination was done by female doctor in all female children, genital examination also conducted by Gynaecologist Documentation was kept confidential. Sampling was done as per convenience .Inclusion Criteria was all cases presenting with history of sexual abuse. Exclusion criteria were cases which did not open a file.

RESULTS : 70 adolescent cases with sexual abuse were enrolled (68 females ,2 males).62%were aged between 14-16 years, in classes 9th and 10th standard.88% were brought by the police, 20 % by parents and 2 % by relatives .84% of the children were residents of Bangalore, 7% from construction sites, mining sites and 8% from rural backgrounds.12% did not given consent for the examination hence 78% were examined. 26% of the perpetrators were unknown, 24% were friends of the victim and 14% were construction site workers ,electrician and daily wage workers . 6% were abused by family members like father, brother and uncle.14% faced abuse in the form being made to fondle private parts ,40% were forcefully kissed. 96% were abused by a single person, 4% by multiple people.65% were abused forcefully ,15% sustained injuries as scar marks over the breasts and 2% received injury over the eye.Following genital examination, all children were subjected to blood test– HIV, HbSAg, HCV Urine pregnancy test. 4 adolescent girls were pregnant .10 adolescents were admitted for management.78% were examined by obstetricians. Allthe cases were counselled by Paediatrician ,Gynaecologist and 17% by psychiatrist . The

average time taken for the team to complete management was 45-60mins. Limitations faced by the CCRU were Inconsistent follow up by the adolescents and time management.

CONCLUSION : In our study, urban and poor socioeconomic background,mid and late adolescence were high risk factors. Morbidities observed were pregnancy, physical and genital injuries. Consensual relationship was in 24% only. There were no acute behavioural problem .Management by multi disciplinary team (CCRU) works efficiently and addresses all the issues of sexual abuse in adolescents.

3. ELECTRONIC MEDIA USE AT NIGHT AND SLEEP DISTURBANCE IN ADOLESCENTS

Shradha Poojary, Amitha Rao Aroor

shradhapoojary17@gmail.com

INTRODUCTION : The most recent lifestyle adaptation in an adolescent is use of electronic media. Although television continues to be a primary source of adolescent entertainment, adolescents are increasingly turning to other sources for their media consumption. Smartphone is perhaps the most rapidly advancing form of media. Excessive electronic media use at night is a risk factor for adolescents' sleep disturbance. To better understand the interplay between electronic media use at night and sleep disturbance in adolescents, this study was conducted.

AIMS AND OBJECTIVES : The aim of the study is to examine whether the use of electronic media at night is associated with sleep disturbances in adolescents.

MATERIALS AND METHODS : This study assessed the association of electronic media use at night andsleep disturbance in adolescents. 450 adolescentsof age group 12-16 years (mean age=13.82 years, SD=1.365, M=54.9%, F=45.1%) studying in class 8, 9 and 10 were included in the study. They completed questionnaires assessing the possession of electronic media use, number of hours spent on using the electronic media at night and sleep disturbance. Further severity of insomnia was assessed using Insomnia Severity Index (ISI). The statistical analysis was done by chi-square test and Pearson's correlation coefficient.

RESULT : Out of 450 adolescents 324 possessed Smartphone (72%), 241 possessed laptop (53.6%), 11 possessed tablet (2.4%), 17 possessed kindle (3.8%) and 443 possessed television (98.4%). The average number of hours spent by the adolescents on electronic media use is 1-3hours. Bedtime use of media was found to be 5-7/week. The switch off time of media was 3-4hours prior to sleep. 53.1% of adolescents went to bed at 8-9PM and the wakening time was 6-7AM (99.6%) 105 adolescents were found to have disturbed sleep (23.3%) and severe insomnia (23.3%). Disturbed sleep associated was seen in 102 adolescents using Smartphone(a.x2=42.946 p<0.001 vhs OR=18.833 CI=5.852-60.638 p), 70 adolescents using laptop (a.x2=9.465 p=.002hs OR=2.035 CI= 1.288-3.215), 4 adolescents using tablet (a.x2=1.07 p=0.301 ns OR=1.912 CI= 0.549-6.664) 4 adolescents using kindle (a. x2=0 p=0.984 ns OR=1.011 CI=0.323-3.171) and 105 adolescents using TV (a. p=0.208nsFishers exact test). Disturbed sleep was noted in 97 adolescents using internet at night (a. x2=14.96 p<0.001 vhs OR=4.089 CI= 1.911-8.75). Smartphone use and severe insomnia relationship was noted in 31.5% (a. x2=46.712 p<0.001 vhs). Poor academic performance associated with disturbed sleep was seen in 28.6% adolescents (a. x2=100.381 p<0.001 vhs). Overall the age group most affected is 16years (36.5%).

CONCLUSION : The study showed that use of electronic media at night is associated with disturbed sleep. It also had an effect on academic performance of the adolescents. Further, the findings of this study confirm earlier reports that electronic media use at night is related to sleep disturbance. Adolescents may benefit from education regarding sleep hygiene and risk of electronic media use at night.

4. SMARTPHONE ADDICTION AND ITS RELATION TO DEPRESSIVE SYMPTOMS IN 15 TO 18 YEAR OLD URBAN ADOLESCENTS

Smitha K, Ashwin A M, Ravish S R

smithark88@gmail.com

INTRODUCTION : Smartphone addiction is on the rise with the dominance of information technology (IT) since the early 20th century. In particular, adolescents have been identified as a major risk group for Smartphone addiction. In India 21% of the population are adolescents, and nearly 20% of adolescents exhibit mental health problems as a consequence of Smartphone over usage. There are limited studies in India relating Smartphone addiction with depression. Hence the present study was conducted.

AIM : To determine the prevalence of depressive symptoms among 15 to 18 year-old urban adolescents with Smartphone addiction

OBJECTIVES : 1.To determine the prevalence of Smartphone addiction in 15 to 18 year-old urban adolescents using Smartphone Addiction Scale (SAS)

2.To compare the prevalence of depressive symptoms among 15 to 18 year-old adolescents with and without Smartphone addiction.

MATERIALS AND METHODS : A questionnaire-based cross sectional study was conducted in Mysore city, among 10th, 11th and 12th standard school children from March-December 2018. With prior permission from the principal of the school, informed consent was obtained from each participant and their parents and children were instructed to fill up the questionnaire. The investigator was present at the time of answering the questionnaire and their doubts were addressed. The questionnaires used were Smartphone Addiction Scale (SAS) and Patient Health Questionnaire 9 (PHQ-9).Descriptive analysis was carried out by the mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. The prevalence and severity of depression was compared between the two groups using chi square test. The mean PHQ-9 score was compared between the groups using unpaired t-test.

RESULTS : A total of 1120 subjects were studied. The mean age was 16.55±0.99 (range: 15-18 years). The mean of total SAS score was 99.41±24. 86.70% of participants had Smartphone addiction (SAS score > the median value of 72). The mean of PHQ-9 total score was 5.55±4.29. Among the subjects with Smartphone addiction, 348(35.83%) participants had mild depression, 107(11.01%) had moderate, 17(1.750%) had moderately severe and 6(0.62%) had severe depression. Among those without Smartphone addiction, 11(7.38%) participants had mild depression, 1(0.67%) had moderate, 2(1.34%) had moderately severe and severe depression each. The difference in the proportion of PHQ-9 total score category between the groups was statistically significant (<0.001).The mean of PHQ-9 total score in High smartphone use group (6.01±4.14) was higher than those in low Smartphone use group (2.56±4.01). Among those with Smartphone addiction, 49.22% had depression while only 10.73% of Smartphone non-addicted had depression. The difference in the proportion of PHQ-9 total score category between Smartphone addiction groups was statistically significant (<0.001).

CONCLUSION : Most of the adolescents had Smartphone addiction. The adolescents with Smartphone addiction had higher prevalence of depression in comparison to those without Smartphone addiction. Of those with Smartphone addiction higher proportion of the subjects had moderate and severe depression.With the increasing popularity of Smartphones, one can always appreciate the advantages it offers however adolescents need to be cautious about its addictive potential that is adversely affecting their mental health.

5. CLINICAL PROFILE OF TUBERCULOSIS IN ADOLESCENTS FROM CHENNAI, TAMIL NADU

Prem Kumar, Latha Ravichandran, Sarala Premkumar

prem17shr@gmail.com

INTRODUCTION : Tuberculosis (TB) is a single major infectious disease-causing significant morbidity and mortality amongst all humans, including adolescents. Tuberculosis amongst adolescents is different from both childhood and adult tuberculosis in terms of incidence and disease manifestations. Also it produces more anxiety and stress in adolescents. The risk of tuberculosis increases during adolescence due to hormonal changes and altered metabolism. The immune response against Mycobacterium tuberculosis is less effective among adolescents.

AIMS AND OBJECTIVES : The objective of the study was to find the clinical profile of tuberculosis in adolescents in the age group of 10 to 18 years in a tertiary care hospital in Chennai, Tamil Nadu.

MATERIAL AND METHODS : This retrospective study was done in SRIHER, Porur, Chennai with approval of Institutional Ethics Committee. Adolescents with tuberculosis in the age group of 10 to 18 years registered in TB clinic were analyzed. The study period was from Jan 2018 to Jan 2019. All of them belonged to lower middle socioeconomic status as per modified Kuppusamy scale classification .Adolescents were further divided into early (10-13 yrs), mid (14-15 yrs) and late (16-19yrs) adolescents. The data was analyzed with Chi-square test using SPSS version 16.

RESULTS : Overall 26 adolescents with tuberculosis were analyzed(42.3%- male) with early adolescents (26.9%), mid adolescents (34.6%) and late adolescents (38.5%). The most common presenting complaint was fever (61.5%) followed by cough (53.8%) and loss of weight (50%). Loss of weight was more significant in females (66.7%) than males (27.3%) with P value 0.047. Cough (80%) and sputum positivity (75%) was more significant in late adolescents (p value 0.028). History of contact with tuberculosis was seen in only 19.2% of adolescents. We had GeneXpert positivity in 42.3% cases with Mantoux positivity in 57.7%. ESR was elevated in 65.4% of adolescents. Out of total 26 adolescents with tuberculosis 13 (50%) had pulmonary Tuberculosis (61.5% sputum positive and 38.5% sputum negative). Majority of pulmonary Tuberculosis patients (92.3%) were mid and late adolescents with chest X-ray abnormality. The extra pulmonary manifestation was present in 50% of cases with predominance in early adolescents (53.8%). We had one case of MDR (multi drug resistant) TB (3.8%) in a late adolescent with pulmonary Tuberculosis. HIV (Human Immunodeficiency Virus) positivity was seen in one late adolescent (3.8%) with abdominal TB with mother being HIV positive. Following high rates of disease progression in infants and young children < 5 years, it increases again during adolescence. Adolescent tuberculosis presents with challenges in case detection and management and they need adherence support. Adolescents with TB-HIV co-infection have the risk of premature discontinuation of treatment.

CONCLUSIONS : Extrapulmonary tuberculosis is seen predominantly in early adolescence. Two important factors that we must consider during adolescence are TB-HIV co-infection and MDR TB. Contact history is found in only 19.2% of adolescents. Adolescents should be routinely screened for tuberculosis for early case detection and management, so that disease transmission can be prevented.

6. PEER -LED LIFE-SKILLS BASED INTERVENTIONS FOR HIV INFECTED ADOLESCENTS:TRENDS IN CHANGE ON EMOTIONS, BEHAVIOR AND COPING SELF -EFFICACY

Uttara Chari, Chitra Dinakar, Nancy Angeline

uchari@gmail.com

INTRODUCTION : HIV-Infected adolescents go through mental health issues as they battle physical, personal, and social ramifications of their condition. This is especially pertinent in India, where the stigma associated with being HIV positive is significant. Interventions have prominently been adult-driven, with adolescents receiving inputs on physical health issues. This paper presents findings of a peer-led life-skills based intervention on emotions, behavior, and coping self-efficacy of adolescents affected with HIV.

AIMS AND OBJECTIVES : The aim of this paper is to examine trends in change on emotions, behavior, and coping self-efficacy among HIV-infected adolescents post a peer-led life-skills based intervention. The specific objectives are 1.To examine trends in

change in emotions, problem behaviors, and pro-social behaviors among HIV-infected adolescents post a peer-led life-skills based intervention.2.To examine trends in change in coping self-efficacy among HIV-infected adolescents post a peer-led life-skills based intervention.

MATERIALS AND METHODS : A purposive sample comprising of 15 HIV-infected adolescents comprising 6 boys and 9 girls were drawn from a community in semi-urban Tamil Nadu, with support from an NGO working in the area. The median age of the sample was 15 years(range: 12 to 18years). Peers to lead these interventions were selected from amongst the HIV-infected adolescents by the NGO staff, based on competencies, demonstrated on leadership and self-management. The selected adolescents were trained by research staff to be peer-leaders for delivery of a life-skills based intervention for HIV-infected adolescents. The trained peer-leaders delivered the intervention to their peers covering aspects related to biological, psychological, and social aspects of the infection. Targeted life-skills included self-awareness, empathy, problem solving, and interpersonal relationship; all specific to the domain of HIV infection and management. The intervention was delivered using a combination of didactics, discussions, and experiential activities. Assessment was carried out pre and post intervention via self-report on the Strengths and Difficulties Questionnaire (SDQ) and Coping Self-Efficacy Scale (CSES).Median, range, percentages, and non-parametric statistical procedures were employed for examining trends in change post intervention.

RESULTS : On SDQ and CSES, there were significant differences noted from pre to post intervention. On SDQ, there was a significant decrease in emotional problems (Z=-2.14, p=.03),and pro-social behaviors (Z=-1.96, p=.05), and increase in peer problems (Z=-2.29, p=.02), at post-intervention assessment. On CSES, there was a significant decrease in coping self-efficacy (Z=-2.25, p=.02) at post-intervention assessment.

CONCLUSION : The peer-led life-skills based intervention decreased self-perceived emotional problems for HIV-infected adolescents.

1.SLEEP HYGIENE AND DAY TIME SLEEPINESS IN LATE ADOLESCENT STUDYING IN A HEALTH SCIENCES UNIVERSITY

Aparna Krishnakumar, Latha Ravichandran

aparnakrishnakumar5@gmail.com

INTRODUCTION : Sleep hygiene is the most important predictor of sleep quality and it is important for growth, development and good health of children and adolescents. Research has shown diminishing hours of sleep among adolescents in both developing and developed countries. Sleep problems are related to well being fatigue, sleepiness, day time dysfunction at individual levels.

AIMS AND OBJECTIVES : To analyse the factors that affect sleep hygiene and day time sleepiness among late adolescents.

MATERIALS AND METHODS : This cross sectional study was done after IEC approval in which late adolescent students (17 to 19 years) studying at SRIHER were taken as study subjects. The sample size was 560. Students who had chronic medical problems such as asthma , seizures were excluded from the study. A predesigned questionnaire which is based on the adolescent sleep hygiene scale will be handed out to late adolescents.T hose who do not give complete questionnaire or those who do not return the questionnaire will not be included. Data will be collected and analysed using SSPS Software 20.

RESULTS : Out of the 560 individuals, 364 students (65%) felt sleepy during the day while 196 (35%) did not. They were further subdivided as per age as 17 (10.4%), 18 (29.8%), 19 (59.8%).Out of the various factors analysed those who kept the mobile near the pillow 268 (72.2%), those who used the mobile phone for watching TV and playing games before bedtime 307 (68.47%) had day time sleepiness. While those who followed a bed time routine before sleep 267 (47.7%) did not feel sleepy through the day

CONCLUSION : It can be concluded that usage of mobile phones prior to sleep has a detrimental effect on day time alertness, expressing the concern that these are problems due to changing habits and practices in modern society.

2. CLINICAL STUDY OF PREVALENCE OF OBESITY AND OVERWEIGHT AMONG SCHOOL GOING ADOLESCENTS IN THE AGE GROUP OF 11-17 YEARS OF KANGRA DISTRICT

Jamunashree B., Kumar G. V

drjamuna11@gmail.com

INTRODUCTION : According to the World Health Organization (WHO), obesity can be defined as the accumulation of body fat in an abnormal and/or excessive manner which can cause a serious health problem. The disruption of the normal satiety feedback mechanisms, hyperinsulinism, insulin resistance and genetics are some of the biophysiological causes of obesity and overweight.

AIMS AND OBJECTIVES : To study the prevalence of obesity and overweight in school going adolescents in the age group from 11-17 years.

METHOD : The present cross sectional school based study was carried out in the department of Pediatrics, Dr Rajendra Prasad Government Medical College, Kangra Tanda, Himachal Pradesh. All high schools present in Block Kangra, Himachal Pradesh (HP) were enlisted and 10 schools were selected by using random method.

RESULTS: Out of 1300 children included in the study, 669 (51.5%) children were males and 631 (48.5%) children were females with male to female Ratio 1.1:1. Out of 1300 children 37(2.8%) were overweight and 10(0.8%) were obese, prevalence of both overweight and obesity combined was 3.6%. The number of overweight children ranged from 2 to 10 with percentage ranging from 1.1% to 5.4%. and the number of obese children ranged from 0 to 4 with percentage ranging from 0% to 2.2% respectively. In the present study 3% (20) and 1.5% (10) of males were over-weight and obese respectively. Out of 631 females 2.7% (17) and 0% (0) of females were over-weight and obese respectively. Out of 47 (3.6%) children identified either overweight or obese, 4.5% being males (30 out of 669) and 2.7% being females (17 out of 631),.The study showed slight preponderance of males over females.

CONCLUSION : Overweight and obesity among school going adolescents is a major problem even in the smaller cities in India. Behaviour modification and proper communication with the adolescents, especially of the affluent section is necessary to restrict fast food intake, and television viewing.

3. STATUS OF NUTRITIONAL WELL-BEING OF ADOLESCENT GIRLS IN URBAN SLUMS.

Palak Jain, S.R. Agarkhedkar, Shailaja Mane

palakjain812@gmail.com

INTRODUCTION : India is home to 253 million adolescents , of which 47.3% are girls . Adolescence is the second period of rapid growth which serves as a window of opportunity for compensating for early childhood growth failure. Anemia is a major public health problem in India, particularly among adolescent girls contributing not only to high maternal mortality but also to increased perinatal mortality and fetal wastage.

AIMS AND OBJECTIVES : To assess the status of nutritional well being of adolescent girls in urban slums.

MATERIALS AND METHODS : This community based cross-sectional study was carried out among 40 adolescent girls (10-19 years) in a slum area of Pimpri-Chinchwad, Pune, Maharashtra. Anthropometric measurements were taken. Hemoglobin estimation was done using automatic blood analyzer. Statistical analysis was done by mean, standard deviation and chi-square test.

RESULT: 69.2% of adolescent girls were found to be underweight (BMI < 18.5kg/m^2) while surprisingly 10.2% of

girls had BMI >25 i.e. overweight or obese.The prevalence of anemia among adolescent girls was found to be 55.8%, of which 58.3% had mild, 37.5% had moderate and 4.2% had severe anemia.

CONCLUSION : The prevalence of malnutrition and anemia is alarmingly high among adolescent girls of urban slums. Special attention needs to be given on implementation of nutrition programmes, health education, dietary modifications, and deworming to decrease the prevalence of malnutrition among adolescent girls.

4. USAGE AND IMPACT OF DIGITAL MEDIA ON ADOLESCENTS IN URBAN BANGALORE

Julian Joseph, Shalini Agasthi, Kishore Baindur

julianjoseph14@gmail.com

INTRODUCTION : Although effects of internet usage is being studied since 1996 but off late parents and care givers have started worrying more because excessive usage of internet and social mediais leading to addiction.The rapid and exponential growth of media has helped in free exchange of idea and information within no time across nation. Internet has not only helped in expanding social circle of adolescents but also in maintaining existing relationships. Excessive use of internet has been linked to development of several psychiatric illnesses like depression, low self-esteem and anxiety issues.

AIMS AND OBJECTIVES : To understand the usage and impact of digital media on adolescents in urban Bangalore.

METHOD : A cross sectional study, with a convenient sample of children between 11-18 years attending schools in central Bangalore was done. Social media disorder scale and PUMP scale were the tools that were used during study.

RESULT : Out of 710 students that were surveyed, 13 and 15-year-old formed the largest group. 77% of students had direct access to internet. 33% of students satisfied the criteria for having social media disorder (SMD). Statistically significant correlation between exposure to media and SMD, mild to severe effects on IP relations, lifestyle and behavior($P<0.001$) was identified. Various other behavioral issues like Social media disorder vs time of going to bed, SMD vs dietary habits and SMD vs self-reported medical problems. ($P<0.001$)of statistical significance were also noted.

CONCLUSION : Schools, Parents and Pediatricians should recognize that Social Media Disorder and Internet Addiction are no longer a fad today. Early identification of those at risk, strategies to manage such risks, curating the content available online and on TV, addition of safety features on internet and social media are few ways to reduce the negative effects of media on developing brains.

5. NUTRITIONAL STATUS OF ADOLESCENTS IN POONAMALLE, TAMIL NADU

Rishab Bhurat, Sarala Premkumar, Padmasani L.N, Dhivyalakshmi. J

rishab.bhurat@gmail.com

INTRODUCTION : The worldwide increase in the prevalence of overweight and obesity among adolescents has made it one of the most common disorder in the adolescent age group also.

AIMS AND OBJECTIVES: The objective of this study is to describe the nutrition status o f adolescents in Poonamalle, Tamil Nadu.

MATERIAL AND METHODS : This observational study was done after IEC approval using the school health records of 15 schools from the Poonamalle area. The evaluation had been done during routine school health check up between June 2018 and August 2018. The anthropometric measurements were done by a single trained nurse using digital weighing scale and stadiometer as per standard guidelines. Records of adolescents in the age group of 10-19 yrs were included for study Those children with chronic medical disease were excluded. BMI was calculated by Wt in Kg divided by Ht in m^2 and they were plotted on the Revised IAP 2015 growth charts for boys and girls. The percentiles were converted to Z scores using a template and further analysis was done.The nutrition status was classified as Normal (N), Overweight (OW), Obesity (Ob), Thinness (T) according to BMI for age Z score.As per the Revised IAP growth chart 2015 BMI for age between 0.55 SD and 1.33 SD in male and 0.67 SD to 1.63 SD in female is overweight. BMI for age >1.34 SD in male and >1.64 SD in female is obesity. BMI for age <-1.88 SDis Thinness in both sexes. Statistical analysis was done with Chi-square test using SPSS version 16.

RESULTS : Out of 1750 adolescents 915 (52.3%) were male and 835 (47.7%) were female. They were further divided into three age groups, early adolescents 81.8%, (10-13 yrs), mid adolescents 12% (14-15 yrs) and late adolescents 6.2% (16-19 yrs). (Table.1)

Table.1 Age and sex distribution of nutritional status of adolescents

	Thin n %	Normal n %	Overweight n %	Obese n %	Total n %	P value
Male	99 (10.8)	664 (72.6)	94 (10.3)	58 (6.3)	915 (52.3)	0.228
Female	83 (9.9)	591 (70.8)	112 (13.4)	49 (5.9)	835 (47.7)	
Age groups						
10-13 yrs	153 (10.7)	1040 (72.7)	158 (11)	80 (5.6)	1431 (81.8)	0.039
14-15 yrs	16 (7.6)	144 (68.6)	35 (16.7)	15 (7.1)	210 (12)	
16 – 19 yrs	13 (11.9)	71 (65.1)	13(11.9)	12 (11)	109 (6.2)	
Total	182 (10.4)	1255 (71.7)	206 (11.8)	107 (6.1)	1750	

Overall the prevalence of overweight and obesity was 11.8% and 6.1% respectively. This was much higher than the prevalence of thinness (10%). The prevalence of overweight/obesity in female adolescents (19.3%) was higher than in males (16.6%), but the difference was not statistically significant (p 0.228).The prevalence of overweight was highest in mid adolescents (16.7%) and the prevalence of obesity was highest in the late adolescents (11%). This was statistically significant (p <0.039).

CONCLUSION: Overweight and obesity are more common in the adolescents than thinness. The prevalence obesity increases steadily from early adolescence to late adolescents.

6. A STUDY ON EFFECTS OF USING ELECTRONIC MEDIA ON EMOTIONAL WELL-BEING AND BODY IMAGE IN ADOLESCENTS.

Shubhangi Agarwal, Shailaja Mane, Siddhi Bora, S.R. Agarkhedkar

shubhangiagrawal@hotmail.com

INTRODUCTION : there is spurt of growth of internet users worldwide. There are 7billion internet users till June 2016, India was 2nd in Asia with 462 million internet users. Thus internet penetration in India is 36.5% of total India's population. Improper use of media affects mental status and emotional well-being of adolescents. This study will evaluate emotional intelligence with perception and attitude towards body weight, shape and body image among adolescents. With the help of this study further steps like screening and management can be taken.

AIMS AND OBJECTIVES : 1. To assess the Effect of using electronic media on emotional well-being in adolescents. 2. To assess the Effect of use of electronic media on body image

MATERIAL AND METHODOLOGY : A cross-sectional, prospective, cohort study was conducted in Coed School, Pune. Institutional ethics committee approval was taken.

The period of study was from June 2018 to August 2018. Sample size-Total 200 students were included in this study. Among which 100 were 13 years students and 100 were 14 years students.

RESULT : Multidimensional body self-relation questionnaire showed significant effect on concerns about body appearance, body areas satisfaction and overweight preoccupation in both boys and girls. But boys were concerned about fitness and girls about health in addition.

Boys spent more time using electronic media than girls (p<.001). significant difference was noted for total media use and television viewing (p<.001) for a mean difference in time between boys and girls.

CONCLUSION : Use of electronic media by adolescents is on an average 5 to 6 hours per day with maximum use of television and computer which is having negative impact on their health and body image as well which can have impact on their emotional well-being in long run. It can lead to psychological stress and depression in them.

This study highlights the immediate need of mass efforts for awareness sessions in the schools to reduce use of media which is having negative impact on their body image and physical health. Such awareness sessions for parents and teachers will be helpful as well.

7. WRIST CIRCUMFERENCE AND OBESITY: COMMUNITY-BASED ADOLESCENT STUDY AT MUMBAI

Anita Patil, Priti Patil, Prashant Bhandarkar

dranitap@rediffmail.com

INTRODUCTION : Childhood obesity and its consequences have reached alarming proportions worldwide and in India. Wrist circumference is emerging as an easily measurable reproducible parameter for screening children at risk of obesity and related morbidities such as hypertension and insulin resistance. Anthropometric growth of human body is proportionate across various organs. Overall growth is of crucial interest hence, there are several ways to identify overweight /obesity in the initial two decades of life. Studies have discussed the application of wrist circumference as an easy to use predictor of general obesity.Wrist circumference is easyto measure than BMI calculation for finding overweight/obese status among adolescent.

AIMS AND OBJECTIVES : The primary objective of this study is to evaluate the association of wrist circumference with obesity in adolescents. While a secondary objective is to determine the age sex-specific optimal cut off points of the measures in association with obesity in adolescents.

MATERIAL AND METHODS : A cross-sectional community-based multicenter study was performed in Mumbai. Adolescents from the age group of nine to fifteen years were interviewed at Atomic Energy Central School. Anthropometric parameters weight, height,wrist circumference were taken. Based on IAP growth chart individual obesity status were evaluated. Age-sex-specific cut-off of wrist circumference were referred from Khadilkar 2018 study. Further association of wrist circumference with obesity/overweight was checked using the Area Underthe Curve(AUC).

RESULTS : 1138 adolescents (586 boys and 552 girls) 9 to 15 years were selected from five schools. Overweight and Obese children were 34% in the study population(Overweight 20%,obese 14%), with significance difference across gender (p-value 0.653).Based on wrist circumference percentile 29% were found to have more than high wrist circumference values, with no gender wise difference(p-value 0.001). The average wrist circumference of boys and girls was 13.04 cm and 13.08 cm at 9 years and increased to 15.1 cm and 14.33 cm, respectively, at 18 years. BMI and Wrist circumference values found to have marginal correlation (correlation coefficient 0.781).Area under curve (AUC) in obese adolescent using wrist circumference is 0.89.AUC in overweight /obese adolescent using wrist circumference is 0.88.

CONCLUSIONS : A Significant association was documented between wrist circumference and overweight and obesity

8. OBESITY IN ADOLESCENTS AND LIFESTYLE

Alpana Shukla

alpanashukla50@gmail.com

AIM-_ To study the factors of lifestyle resulting overweight and obesity in adolescents.

INTRODUCTION : The incidence of overweight and obesity is increasing day by day among adolescents of today. Not only in our country, obesity among adolescents is an increasing public health issue in the global scenario. Obesity in adolescents is a high risk factor for cardiovascular diseases, dyslipidaemias, diabetes, social and emotional issues etc.High rates of morbidity and mortality are also reported with obesity initiating in adolescence age. Unless this outbreak is controlled at its grassroot level, it's implications on future generations will be perilous.

MATERIAL AND METHODS : 300 adolescents, from my regular OPD, within 12 to 15 yrs were included in the study, who were either overweight or obese according to BMI standards. This study was conducted from 1st January 2016 to 30th March 2017. A questionnaire was given to them and duly filled up in the presence of the mother while talking to the parents and the child. Height was taken with proper standards and weight was taken in kgs. Factors taken into consideration-1) Consumption of food in front of TV2)Physically active (Cycling to school or Outdoor games for at-least an hour).3)Both parents working.4)Occupation of parents.BMI was calculated and height, weight were plotted on standard graph also.

RESULTS : It was found that overweight or obesity was significantly higher in children who ate food in front of TV. 83.3 % of the Sample were found to eat food in front of TV Overweight or obesity was found more in children who played less outdoor games or went to school by bus or some vehicle. 86.7 % of the sample were physically inactive. Overweight or obesity was found more in those children whose both parents were working. 87.3% of the sample had both the parents working in the family. Overweight or obesity was found to be significantly more in business families followed by parents in private job and then in education department. 59% of the sample were from business families, 20.7 % of the sample had their parents in private jobs while the left 20.3% had their parents working in Education department.Adolescence related overweight and obesity is an important perspective to be thought of and dealt with as on today.

DISCUSSION : If it is dealt with at this point of time of adolescence, obesity later on can be controlled and a number of health issues can be solved and prevented. This is the age and time when with proper counselling and regular screening and advice, adult obesity can be prevented. Factors considered can be easily modified by regular counselling of child and parents. Nowadays eating food in front of TV is found in almost every house. Explanations like the child does not have time for recreation at all due to burden of tuition and coaching is almost universal with all these children. Due to the burden of studies and tuitions, as expressed by parents, children of today do not have time for games at all. Also, due to shortage of time, they either go to school in their personal vehicle or bus. Cycling is never on their cards. When both the parents are working, both of them hardly has any time for child's general counselling and care. Most of them always have an excuse of being tired by the end of the day and relaxing the lifestyle of the child according to his choice. Business class families are very relax about the lifestyle of their children. Probably due to their odd working hours. Parents who are in private jobs are also engrossed in their jobs for more than normal hours. They again have a pretext for their child's wrong lifestyle factors. Parents in the teaching job are involved in time to time manoeuvres of health related educational tips to children. Probably this is the reason that they have knowledge of dietary patterns and lifestyle which are good for their child.To summarise, food on the dining table with parents, cycling to school or outdoor games at least for an hour daily and regular counselling on diet and lifestyle can go a long way in decreasing the load of obesity among our adolescents. This will surely lead to a healthy and hearty future of our country.

9. HEADACHE IN TEENS : A COMPARATIVE STUDY ON REAL ISSUE ,CLINICAL PROFILE, SUBTYPES AND TRIGGERS

V. Nivetha, Sajijames, Ranjith Kumar, P.Anitha

drnive4@gmail.com

INTRODUCTION : Adolescent headaches are highly disregarded as a symptom while it can have deleterious effects on the adolescent's well-being. Early identification, appropriate investigations and definitive diagnosis are the need of the hour. Data on primary headaches in adolescents in India as per the updated International Classification of Headache Disorders (ICHD 3 are limited.

AIM : To study the clinical characteristics, triggers and subtypes of primary headaches in adolescent age group as per updated ICHD 3

MATERIALS AND METHODS : Prospective observational study between July 2016 and July 2018 in adolescents in the age group of 10-18 years.

RESULTS AND DISCUSSION : Out of 299 children enrolled, 251 were diagnosed with primary headache. Primary headache was more common in children between 13-18 years with migraine (54.2%) being more common than TTH (45.8%). Most common subtype of migraine was migraine without aura(58.8%) followed by chronic migraine and probable migraine(17.6% each). Predominant age of presentation was 10-12 years for Migraine and 13-18 years for TTH. Migraine episodes lasted longer (>2hours) compared to TTH. 78% of migraine and 21% of TTH subjects experienced an episode on monthly basis(p value=0.000).Dietary pattern (36.8%) was found to be the most common trigger for migraine , whereas stress(61.7%) triggered TTH in most cases. According to Visual Analog Scale(VAS), severity of migraine was moderate to severe, whereas in TTH it was mild to moderate.

CONCLUSION : Among primary headaches, Migraine is most common between 10-12 years and TTH between 13-18

years. Dietary pattern is the most commonly associated trigger for migraine whereas TTH had multiple triggers with stress being the commonest. Children with migraine mostly had significant family history. Primary headaches need to be identified and treated early. This study gives an insight into the common triggers, subtypes and clinical profile of adolescent headaches and will pave way for better understanding of the real issue.

10. BODY IMAGE ISSUES AMONG ADOLESCENTS

Joewin Monteiro

joewinmont@gmail.com

INTRODUCTION : Influences such as media, puberty, peers etc. exist in adolescent years that affect ones body image perception. There may be over emphasis on appearance which may lead to negative body perceptions and dissatisfaction. This perception is believed to affect gender identity and roles in the society. Hence we felt the need to study the body image perception in adolescents. The hypothesis was negative body image perceptions are present in adolescents

AIMS AND OBJECTIVES : The aims were to enquire about perception of body image in adolescents and correlate with their gender roles.

METHODOLOGY : This study was conducted among 192 adolescents(11-15 years). Each student was administered a questionnaire after consent from the school authorities, parents and assent from the students. Students were asked questions regarding their body image and their perception of ideal body image. Calculated Sample size-190 adolescents.

RESULTS : There were 138 males and 52 females.106 boys considered fathers as their role model for height.45 felt that increase in height would improve their body image. Average weight was 36.9 kg. 7 boys felt that they were underweight, 7 felt extremely thin and 6 felt they were overweight. 68 boys felt that acne and 9 boys felt that bad breathspoils their image. 10 boys were aware of their pubertal changes, 2 have discussed with father and 1 with mother and the rest with teacher. 47 boys had axillary hair, 18 felt it was bad. 12 had growth of facial hairs and felt it was good. 58 experienced changes in voice,45 felt it was good. 17 boys were educated regarding the changes in the body during puberty. 47 boys were aware about pregnancy, 4 about contraception and 66 about STD. Most received the information through teachers. Among the girls, average height was 152.2 cm.22 considered fathers as role model for height. 13 felt increase in height would improve body image. 5 felt they were underweight and 11 felt they were overweight for age. 43 girls felt that acne and 2 girls felt that bad breath spoils their image. 11 felt that hair changes would improve body image. 52 girls were aware of pubertal changes and had received information from teacher. 36 girls had attained menarche, 16 had positive attitude. 49 girls developed axillary hair, 47 felt it was unwanted. 47 had perception about body image and 23 felt it was good .All girls had been educated regarding the changes in the body during puberty and most from the mother.29 girls were aware about pregnancy, 36 about menstruation, 3 about contraception, 31 about STD. Most received information through teachers. Shopping was commonly allotted to boys and cleaning to girls. They expressed satisfaction with their allotted roles. 31 boys and 20 girls wanted more roles usually allotted to other gender. Statistically, none of the perceptions had significant p value.

CONCLUSION : 96% adolescents were happy with their body image. 24%felt that an increase in their height would improve their body image. 44% students would like to learn about body changes from parents and teachers, and were happy with the roles allotted to them.

11. ADOLESCENTS AND MENSTRUATION: ARE THEY INFORMED ENOUGH?

Sameeta M Prabhu, S M Prasad, M Govindraj

sameetamp@gmail.com

INTRODUCTION : Menstruation is a natural and necessary change experienced by adolescent girls. Many girls still remain uninformed and do not have the comfortable experience. The culture and social norms have many restrictions on them. The girls and women need guidance to ensure their basic health and well-being. To achieve this, they require awareness and education about menstruation and menstrual hygiene, access to safe products, water and sanitary facilities. This study focuses on the awareness, and perceptions of girls towards menstruation and to ascertain whether the prevailing norms and practices are hygienic.

AIMS AND OBJECTIVES : 1)To assess the awareness and perceptions of adolescent girls regarding menstruation 2) Ascertain whether prevailing norms are hygienic.

MATERIALS AND METHODS : This institution based cross-sectional study was carried out among the school going adolescent girls of schools within 5 km radius from Dr.B.R. Ambedkar Medical College from June 2019 to July 2019.Data was collected using a predesigned, pretested, structured questionnaire method after taking informed written consent. Consent from head of each school was taken before conducting the study. Sample size: 250

ELIGIBILITY CRITERIA : Inclusion criteria: Adolescent girls between 13 to 15 years of age and those who had attained menarche. Exclusion criteria**:** Students not willing to take part in the study and girls who have not attained menarche

METHOD OF COLLECTION OF DATA

The questionnaire was prepared so that it complied with the objectives of the study. The questionnaire had three sections: Section A:Knowledge and awarenessSection B: Practices and Norms Section C: Attitude and Perceptions

STATISTICAL ANALYSIS : Data obtained was compiled and analyzed using Microsoft excel.The awareness on menstruation is poor and menstrual hygiene was satisfactory. However, most of the adolescent girls had unfavourable and preconceived ideas on menstruation.

CONCLUSION : Although the adolescent girls are fairly informed on menstruation and menstrual hygiene, the

perceptions and methods followed need further improvement. This can be achieved by rigorous educational programs and enforcing a well made plan for adequate hygiene practices in schools.

12. POISONING IN ADOLESCENTS

Bhanuprakash, Sarala Sabapathy, Lakshmi

bhanuprakashmr1993@gmail.com

INTRODUCTION : Poisoning is an important public health problem causing significant morbidity and mortality throughout the world. Adolescent suicide has become increasingly more prevalent in recent years,with self -poisoning being a frequent means of suicide attempt.

AIMS AND OBJECTIVES : To assess the causes and common methods of attempted adolescent poisoning.

MATERIALS: All children aged 11-17 years with h/o poisoning, attending paediatric emergency department of BMCRI college Bangalore from January 2019 to July 2019 were the subjects of our study.

METHODS : Cases were evaluated retrospectively; data was obtained from the hospital medical records. Following factors: socio demographic data, educational status , agent and route of intake ,motivation for over dose, and the intention of suicidal attempts were analysed.

RESULTS: 40 cases of adolescentS aged 11-18years(mean age 17 year)who attempted suicide were evaluated. The male: female ratio was 1:2(13:27).Most of the patients were attending high school. Oral ingestion was the only route of intake, 65% of the patients ingested non-medicinal compounds and 32.5% ingested drugs & 2.5 % ingested seed. 87.5% cases improved, 10% LAMA, 2.5% patients could not be saved. Pesticides like Rat poison was the most commonly used non medicinal agent while commonly used household materials like Phenyl & Harpic were also consumed by many.It was also observed that pills were not consumed alone mostly they were used in combination with some other chemical substances (1 patient consumed multiple drugs with glass piece).Suicide attempts were mostly associated with anger outburst (impulsive act) after fighting with family members.

CONCLUSIONS : We found that self-poisoning attempts occur more frequently in females at high school, usually in context of family dysfunction. Most of our patients were symptomatic and required hospitalisation because of the inherent toxicity of the substances implicated.

13.ASSOCIATION OF STRESS WITH SLEEP AND FATIGUE IN SCHOOL GOING ADOLESCENTS STUDYING IN CLASSES 9TH TO 12TH IN CHENNAI

Ruchi R.Mittal,.Latha Ravichandran

mittalruchi94@gmail.com

INTRODUCTION : Stress is inevitable in today's world. The period of adolescence is well recognised as a period of 'stress and storm' as an adolescent has to undergo a lot of physical and mental changes during this stage. Studies have shown that the levels of perceived stress among adolescents is around 30-70%.Adolescents are unable to meet the required 8 to 10 hours of sleep every night required for optimal functioning. This leads to poor cognitive functioning, poor academic performance and increases stress levels. Also, adolescents with higher stress levels have found to have reduced sleep and increased daytime sleepiness. Fatigue is the sensation of tiredness that does not seem to be alleviated by rest with or without other physical symptoms present. Many empirical studies demonstrate that fatigue is negatively influenced by stress and vice versa. It has been suggested that fatigue is most associated with perceived stress and perceived health status. Thus, with increased stress there is an increased risk for chronic fatigue.

AIMS AND OBJECTIVES : To determine the degree of stress among participants,.To determine the association between stress and sleep.To determine the association between stress and fatigue

MATERIALS AND METHOD : This is a cross-sectional study. Schools were selected and permission was obtained. Informed consent was then obtained from the parents and assent was obtained from the students. Questionnaires (Perceived stress scale, Epworth's sleepiness scale and Fatigue Pictogram) were given to the students. Questionnaires were scored as per the scoring system suggested by the author of the respective questionnaires. Results were then analysed using the SPSS statistics 17.0 software.

RESULTS : Total of 295 students filled the questionnaires out of which 92 were found to have low stress, 106 were found to have moderate stress and 97 were found to have high stress. Amongst the demographic data, age and class were found to be highly significant ($p<0.001$). Association of stress with sleep and fatigue was found to be highly significant ($p<0.001$).

CONCLUSIONS : Stress, sleep and fatigue seem to be in a vicious cycle. It is important to intervene at schools and educate adolescents about stress management and help them become more resilient.

14.A STUDY OF HEALTH PROFILE AMONG ADOLESCENT SCHOOL STUDENTS OF BAGALKOT

Umesh Ramadurg, Anjali, B.S. Mannapur, A.S. Dorle

anjali.tanwar21@gmail.com

INTRODUCTION : Adolescence and young adulthood are periods of critical development and transition. Adolescent constitutes over 23% of the population in India. Nutrition and health needs of the adolescent are more because of more requirements for growth spurt and increase in physical activity. Student health and academic achievement are interdependent. Healthy students are more effective learners. Academic success and achievement strongly predict overall adult health outcomes. Worldwide, obesity trends are causing serious public health concern and in many countries threatening the viability of basic health care delivery. Obesity and overweight are the major reasons of preventable deaths in India. Sedentary lifestyle and junk food is to be blamed for more than three hundred thousand deaths per annum.Childhood obesity can also lead to poor self -

esteem and depression .The obesity is a genuine health issue that starts to shape and develop in adolescence, yet whose inconveniences cannot be seen until adulthood. So there is remarkable need for awareness for safe weight reduction and healthy behavioral change adaptation.

AIMS AND OBJECTIVES : To assess the health profile and its associated risks among school going adolescents in Bagalkot district.

MATERIALS AND METHODS : A school-based cross-sectional study was conducted during the scholastic year 2018–2019 on 145 adolescent students of secondary schools in Bagalkot. A structured questionnaire was used to assess the socio-demographic characteristics and adolescent health and illness profile issues.

RESULTS : Out of 145, 91(62.75 %) were boys and 54(37.24%) were girls. Majority of them were Hindus 139(95.86%).About 107(11.72%) were from nuclear families. The mean calories calculated was 1042.17 kcal. The prevalence of overweight is 4.82% and obesity is 3.44%. The study revealed that 9.6% girls were suffering from anemia. 14 (9.65 %) adolescents had defective vision. 12% adolescents were having dental caries. 4.0% adolescents had skin diseases.

CONCLUSION : Our study addresses various health profiles, lifestyles determinants which are needed to build sustainable and healthy foundation pillars among the adolescents. So, the preventive and promotive measures focus should be on awareness of nutritional education and active physical lifestyle and healthy behavior which should be developed in early childhood.

15. STUDY OF PREVALENCE AND DISTRIBUTION OF SEXUAL ABUSE AMONG ADOLESCENTS IN LUCKNOW

Nirupama Mishra, Utkarsh Bansal, Nirmala Joshi

email :

INTRODUCTION : Child Sexual Abuse (CSA) is a universal problem with grave lifelong outcomes. The WHO defines CSA as “The involvement of a child in sexual activity that he or she doesn't fully comprehend and is unable to give informed consent to or for which the child is not developmentally fully prepared or else that violate the laws or social taboos of society". CSA is associated with both physical and psychological abuse but still the society lacks awareness to prevent it. CSA being a taboo in India even now, mostly cases go unreported.

AIMS AND OBJECTIVES : To study the distribution and prevalence of sexual abuse among adolescents in Lucknow.

MATERIAL AND METHODS : A cross sectional study was conducted by randomly selecting 04 schools of urban Lucknow out of total and 2 rural schools out of total school in rural area of Lucknow. We selected 200 students from urban area and 100 students from rural area of 10-19 years age group, A total of 300 adolescents were studied using Finkelhor's questionnaire in CSA along with a set of questionnaire for the family background and socio economic status. Only those students whose parents gave informed consent to participate in the study were chosen, with an undertaking of keeping their identity confidential. **Statistical Analysis :** The data was analyzed using SPSS version 21.0. In data analysis, for categorical variables non-parametric test and for continuous variables parametric test were used. p value < 0.05 was taken as statistically significant.

RESULT : Mean age of males was 12.48 years, and for females, it was 14.45 years. Our study showed boys faced CSA at a younger age and most perpetrators were known to victims, most common method being cyber related (pornography). More girls from urban areas reported abuse, indicating poor reporting in the rural areas. There is a significant difference in prevalence of CSA in rural and urban girls while not so in case of boys. Overall prevalence of CSA was 35% in the present study.

CONCLUSION : Childline Lucknow has reported 16 rape cases in the year 2018(as compared to 38 in Bangalore) among the 242 total reported CSA cases. Survey by the United Nations showed 42% prevalence of CSA in girls, which is at par with our study (prevalence in urban girls 55% and in rural girls 40%). Hence the study reveals an alarming prevalence of CSA in our community which requires immediate attention by the parents and the authorities. CSA related to cyber cases are also on high, need to check the use of internet in children(which is equally high in rural as well as urban).Adolescents should be given appropriate awareness and structured education about CSA. Parents role is pivotal in the bringing the CSA rates down by being compassionate and friendly to their children, so that the children may be able to report the offences immediately to them.

16. SERUM MAGNESIUM CONCENTRATION IN CHILDREN WITH ASTHMA

A. Preethi, P.N.Vinodh

apreethi1993@gmail.com

INTRODUCTION : Asthma is one of the most common chronic diseases worldwide and has been increasing in prevalence over the last few decades. Magnesium is one of the most frequently found minerals in the human body. Magnesium ion has an inhibitory action on smooth muscle contraction, histamine release from mast cells and acetylcholine release from cholinergic nerve terminals. Magnesium has been shown to relax bronchial smooth muscle and influence the function of respiratory muscles. Hypomagnesemia have been associated with diminished respiratory muscle power.

AIMS AND OBJECTIVE : To compare the serum magnesium level in children with stable asthma and acute exacerbations.

METHODOLOGY : Study design :Cross sectional study Study setting :Paediatric asthma clinic,ward ,ER in SRIHER.Age group -5 -18 years.Children with stable asthma and exacerbation were identified. Detailed history and examination was done.After getting consent,blood samples were taken and will be sent to biochemistry laboratory. Samples were centrifuged and measured by Xycidyl blue method. 45 children were enrolled ,during the period from July 2018 –July 2020 .Among them 40 were diagnosed as bronchial asthma

The asthmatic patients were divided into groups (1)Children with stable asthma.(2)Children with acute exacerbations.

RESULTS : Mean serum magnesium levels were 2.058+/- 0.2021 in children with acute exacerbations and 2.32 +/- 0.174 in children with stable asthma

CONCLUSIONS : Hypomagnesemia was found in children with acute exacerbations when compared to children with stable asthma

17. EFFECTIVENESS OF HEALTH EDUCATION INTERVENTION ON KNOWLEDGE ABOUT HIV/STI AMONG LATE ADOLESCENT GIRLS OF B.V.V.S POLYTECHNIC COLLEGE BAGALKOT

Simmy Gavel, B.S Mannapur, Dr A.S Dorle, Kalpana Kulkarni

drsimmygavel@gmail.com

INTRODUCTION : Adolescent is a period of transition from childhood to adulthood . WHO has defined adolescent as the age group between 10 to 19years. It is classified into early adolescent (10-13yrs), mid adolescent (14-16 yrs), and late adolescents 17-19yrs). India has the 3rd largest epidemic for AIDS in world. There were 88,000 new HIV infections and 69,000 AIDS related deaths in 2017 . Sexually transmitted infections are becoming a major public health problem in India. Lack of knowledge about HIV and STIs makes adolescents vulnerable for the disease.

OBJECTIVE : 1.To study the baseline knowledge of college going adolescent girls regarding STI and HIV. 2.To know the impact of health education with regards to STI and HIV among adolescent girls.

METHODOLOGY Study design : Before and after comparison study without control. This study was an educational interventional study conducted in B.V.V.S Polytechnic college Bagalkot for 3 months duration(July-September 2018). College going late adolescent girls of 17-19 years of age. Sample size: Sample size of 90 was calculated at 95% confidence level, 80% power of the study, according to the study conducted by Parwej S. A pre designed pre structured questionnaire on knowledge about socio demographic profile, mode of transmission , tests for detection, preventive measures about HIV and STI and misconceptions related to HIV was administered. Later health education session was conducted and after three months again same questionnaire was administered to the students. Chi square test was applied to see whether health education intervention has significant improvement in the level of knowledge about STI and AIDS. p value of <0.05 was taken as significant

RESULTS : Out of 90, majority (40%) were Hindus, mothers of participants were educated till secondary school, and majorities were of lower middle socio economic status. In pretest 27.7% and 37.7% had correct knowledge about the mode of transmission of STI (unprotected sexual contact) and HIV (high risk sexual behaviour, infected needles, infected blood transfusion, through mother to child, tattooing) which improved to 95.5% and 96.66% in posttest. Similarly knowledge about blood test to detect HIV and preventive measures (condom, single sex partner, safe blood/sterile needles) improved from 67.77% and 7.77% to 93.33% and 96.66%.

CONCLUSION : This study clearly showed that educational intervention programme is helpful in improving the knowledge about STI/HIV among college adolescent girls.

1.A RARE CASE OF RECURRENT ABDOMINAL PAIN

Subramanya

subbu01506@gmail.com

INTRODUCTION : Evaluation of abdominal pain in adolescents can prove a diagnostic challenge as they may have limited ability to give an accurate history. Parents or guardians may also have difficulty interpreting the complaints in this age group. In many cases the causes are benign, with few long-term sequelae. However, some require rapid diagnosis and treatment in order to prevent significant morbidity or mortality. Consideration of the age helps to narrow the differential diagnoses to include adolescent-specific conditions.

CASE REPORT : A12-year-old female firstborn of a non-consanguineous marriage was brought by her parents with complaints of recurrent abdominal pain and vomiting since the last 3 months.In the first episode she had severe abdominal pain that was diffuse, sharp and stabbing in nature, with no radiation, no postural variation, no aggravating or relieving factors. There was associated acute onset of high fever, with no chills or rigors and no diurnal variation. She also had dyspnoea. She responded to symptomatic treatment. A month later she had a second episode of severe abdominal pain and high-grade fever, which necessitated 10 days of IV medication for relief of symptoms. The third episode occurred two months later: there was diffuse abdominal pain, sharp and stabbing in nature, non-radiating, with no postural variation. There was vomiting too, which was not projectile and non-bilious. On examination she was a febrile, her vitals were normal, and there was diffuse abdominal tenderness. Bowel sounds were heard normally. Many possibilities were initially considered in the differential diagnosis. Investigations revealed high levels of serum amylase and lipase.USG abdomen was suggestive of Acute Pancreatitis.CT Abdomen showed acute oedematous pancreatitis with mild CBD/pancreatitic duct dilatation, but no calculi or calcification. ERCP revealed Pancreas divisum i.e. the dorsal pancreatitic duct was anterior to the CBD and drained into the minor papilla, the ventral pancreatitic duct communicated with the dorsal pancreatitic duct, and the whole pancreas drained into the minor papilla, while the CBD drained separately into the major papilla. Management required surgically restructuring the anatomy.

LEARNING POINTS : Pancreas divisum is the most common congenital anatomic abnormality of the pancreas. Incidence is 4-14% with 30-35% presenting with recurrent abdomen pain and episodes of pancreatitis. There is failure of fusion of the dorsal and ventral pancreatic duct. This results in a relative obstructive pancreatopathy caused by a stenotic minor papilla. Most cases are diagnosed during autopsy.

2. ANOREXIA NERVOSA: A MISSED DIAGNOSIS

Jincy Joseph

srjincycaritas@gmail.com

INTRODUCTION : Anorexia Nervosa may be missed when masked by depressive and obsessive symptoms.

CASE REPORT : A 14-year-old girl presented to our hospital with decreased eating for 6 months associated with weight loss of 15 kg and amenorrhoea for 4 months. She was withdrawn, and had persistent low mood. She was extremely emaciated. She admitted to fear of becoming overweight and perceived herself as fat. Her diet for the last 2 months was only around 100-200ml per day of fruit juice or Coca Cola. She was passing urine once in 2 days and hard stools once in 10 days. She also had features of OCD (Obsessive Compulsive Disorder) like not swallowing saliva with constant spitting, frequent handwashing, taking multiple daily baths, and repetitive thoughts. She was the third child born to her father from his second marriage. The first wife had a pregnancy loss following which she had to undergo hysterectomy. Her father then married his wife's sister. Her primary caretaker since early childhood was her stepmother. The patient was an above average student academically (80-90% marks) and a perfectionist. She stayed in a hostel from the 3rd standard. She was sent home from the hostel and school 5 months ago due to reduced eating and poor interaction with peers and teachers. She was evaluated in multiple hospitals. All her investigations including complete blood counts, liver function tests, renal function tests, multiple ultrasound scans of the abdomen, CT scan of the abdomen, and an endoscopy, were normal. On examination, her weight was 23.7 kg (<3rdcentile), height 153.3cm (50thcentile) and BMI 10kg/m^2(<3rdcentile). Her pulse rate was 96/min, blood pressure100/70mmHg, respiratory rate 20/min and temperature 98^{o}F. Her skin was dry and wrinkled. Her face had the appearance of an old woman. There was no pallor, lymphadenopathy or edema. Systemic examination was normal.On investigation,her blood counts, sugar, electrolytes, renal and liver functions and TSH were normal. Urine examination showed ketonuria. Chest X-ray showed a small tubular cardiac shadow. ECG was within normal limits.She was admitted with a diagnosis of anorexia nervosa, major depression, and OCD. She underwent gradual re-feeding, which was supplemented with vitamins and minerals to prevent electrolyte imbalance and refeeding syndrome. Simultaneously she was prescribed SSRIs and underwent multiple sessions of counseling regarding the importance of healthy diet and optimum weight. Insight and affect improved gradually, and she was discharged after 30 days with weight and BMI at the 3rd centile. She was followed up in the OPD for counseling and weight monitoring.

LEARNING POINTS : Diagnosing anorexia nervosa requires a high index of suspicion in an adolescent presenting with poor eating due to any cause. A history of fear of being overweight and perception of being fat is a clincher. Comorbid conditions like depression and anxiety when associated with poor food intake can confuse the diagnosis due to overlap in symptoms. They have to be treated adequately to improve outcome.

3. GIANTS IN ADOLESCENTS

Josmy Joseph

srteslinmary@gmail.com

INTRODUCTION : Virginal breast hypertrophy in adolescents is multifactorial and usually idiopathic, associated with obesity or

hormonal imbalances. The disease is sporadic, but rare familial cases are reported. It usually occurs in the peripubertal age group. It can be distressing to adolescents, as vulnerability to a negative body image and the desire to fit in predisposes them to significant psychosocial stress. Social issues arise secondary to poorly fitting clothing, trouble exercising and public scrutiny resulting from their enlarged breasts. Physical ailments including back pain, shoulder pain and kyphosis cause further anguish.

CASE REPORT : A 13year 9month old adolescent girl presented with excessively enlarged breasts for 2years with rapid enlargement for the past 6 months, associated with pain in the breasts. There was no discharge or breast lump. She preferred to lean forward due to heaviness of the breasts, and complained of neck pain. She avoided outdoor activities and talking to others due to pain on physical exertion and embarrassment about her breast size. She attained menarche at 12 years with regular cycles and normal flow. Her paternal grandmother had similar size breasts. Her weight was 25^{th} -50^{th}centile, height 3^{rd}-5^{th} centile and BMI 50^{th}-75^{th} centile as per the IAP chart. Tanner staging: Pendulous breasts+, enlarged areola, no lumps; P3 A3. Her hormonal profile was within normal limits. An endocrine surgeon advised her to defer reconstructive surgery until her breast size stabilized. On follow up over a year, the breast size had stabilized for 4 months but other symptoms persisted.

DISCUSSION : Virginal breast hypertrophy is a rare and incapacitating condition where an alarmingly rapid and continued breast growth occurs during puberty. Often there is a 6-month period of extreme breast enlargement, followed by a longer period of slow but sustained breast growth. The underlying mechanism is not clearly understood. One proposed theory is an end-organ hypersensitivity to normal levels of gonadal hormones. An alternative hypothesis is that there is increased hormonal activity. Differential diagnosis considered in this case were ?brocystic disease, adolescent macromastia, virginal breast hypertrophy, phyllodes tumor, juvenile papillomatosis and excessive endogenous or exogenous hormonal levels. The approach to our case was multidisciplinary: Adolescent Pediatrician to reassure her about body image, Psychologist to deal with her anxiety, Physiotherapy, and adequate size clothing. The plan is to follow her up for 5years, begin medical therapy if rapid progression occurs, and intervene surgically after breast size stabilizes if physical discomfort persists. A multidisciplinary team needs to carefully evaluate adolescents consulting for hyperplastic breast disorders. Healthcare providers must be aware of the negative physical and psychological health outcomes associated with this condition.

LEARNING POINTS : Identify the body image issues and the emotional conflicts at the earliest and reinforce positive body image. Explore the various difficulties experienced by the individual and customize the management in terms of clothing. Begin management with non-pharmacological measures and if obese with life style modifications.

4. LAURENCE MOON BARDET BIEDL SYNDROME

R Raju

drraju31@gmail.com

INTRODUCTION : We report a case of Laurence Moon Bardet Biedl Syndrome (LMBBS), a rare Autosomal Recessive genetic disorder.

CASE REPORT : A 14-year-old boy reported to the Adolescent OPD with the complaint of increased weight gain for 3 years. He also had poor scholastic performance in the last 3years, and decreased vision for 1 year. He was born by vaginal delivery with a birth weight of 3.5kgto a 2^0 consanguineously married couple.

On examination he had decreased vision in both eyes,low set ears,moon face, a diffuse goiter, dry skin, acanthosis grade 3, and post-axial polydactyly in both feet. His testicular volume was 4 cc on each side, stretched penile length was 3cm, he had no axillary and pubic hairs (SMR 2).He had generalized and truncal obesity with purple striae on the trunk. Anthropometry was weight 84kg(>97^{th} centile), height 158cm(50^{th} centile), BMI 33.65kg/m^2(obesity), upper segment 75cm, lower segment83cm, and arm span161cm. His mid-parental height was 168.2cm (father 168 cm and mother 155.4 cm). Vitals and other systemic examination were normal.

Routine investigations were within normal limits.S.Testosterone was 0.026ng/ml(low). Fundus showed Retinitis Pigmentosa. CECT Abdomen(KUB) and USG Abdomen showed multiple small renal calculi, small cystic spaces and cystitis.

DISCUSSION : Laurence Moon Bardet Biedl Syndrome is an autosomal recessive disorder. The cardinal manifestations are severe retinal dystrophy, polydactyly, obesity, learning disabilities, renal abnormalities, and (in male patients only) hypogenitalism. Other features of the LMBBS include intellectual impairment, congenital heart block, brachycephaly, deafness, dental anomalies, and pigmentary retinal degeneration. Laurence Moon syndrome may include cerebellar ataxia, peripheral neuropathy, spastic paraplegia, childhood hypopituitarism, and short stature. Bardet Biedl syndrome has facial similarities comprising deep set eyes, hypertelorism with downward slanting palpebral fissures, flat nasal bridge, long philtrum, and a thin upper lip.Recent advances in genetics have enabled investigators to define the syndrome by specific mutations. Twelve genes associated are BBS1, BBS2, ARL6/BBS3, BBS4, BBS5, MKKS/BBS6, BBS7, TTC8/BBS8, B1/BBS9, BBS10, TR1M32/BBS11, BBS12. The BBS proteins are components of the centrosome and affect ciliary transport; hence the disease falls under the spectrum of 'ciliopathies.' There is considerable heterogeneity and intrafamilial variation in the extent and severity of clinical manifestations of LMBBS. The diagnosis of LMBBS is established by clinical criteria.

CONCLUSION : Our patient presented with the classical phenotype of LMBBS. The Paediatrician should examine all cases of obesity or poor school performance thoroughly. Genital examination and Sexual Maturity Rating(SMR) are necessary in all adolescents.

5. TRAINING HEALTH PROFESSIONALS IN PSYCHOSOCIAL SKILLS TO MANAGEADOLESCENTS WITH CANCER

Sakti Priya

msaktipriya10@yahoo.com

INTRODUCTION : Adolescents and Young Adults (AYA) constitute a medically underserved population. Research suggests that AYAs with cancer experience more complex, severe, and prolonged distress than younger childrenwith similar cancers. Psychological counseling and behavioral intervention should be an integral part of cancer treatment. Given the undesirable and untimely life disruptions experienced by them, a critical task of the recovery process is to help them regain a sense of control over their lives as a means of attaining long-term adjustment and well-being.

CASE REPORT : A 17-year-old boy presented with pain in the left hip and thigh and low blood counts. He had to undergo multiple bone marrow biopsies before he was diagnosed to have metastatic rhabdomyosarcoma. He received chemotherapy through a PICC line. Following this he developed severe sepsis, needing multiple transfusions, antibiotics, ICU care and PICC line removal. He completed 3 more cycles of chemotherapy but had multiple psychosocial issues: reluctance to have IV access for more than a day, refusal to stay in the hospital at night, refusing admissions for blood products or IV antibiotics, and non-compliance with review dates. The parents were unwilling to discuss the nature of his illness and treatment with him. Inspite of their motivation, the support of his elder sister (who stopped going to college to look after him), and our friendly counseling, we could not improve his behavior and he refused consultation with the psychologist. Though the repeat scan showed a good response, he refused to continue chemotherapy despite detailed counseling regarding the risk of disease relapse. A few months later he had a relapse manifesting as bladder obstruction. He was counseled and started on local radiotherapy. Then he developed a large and very painful oral lesion that obstructed the oropharynx and caused difficulty in chewing and swallowing. He was given palliative radiotherapy. He understood that his disease was incurable and started preparing his family for his untimely departure. He tweeted to his friends how blessed it is to have a life without a disease. A few weeks later he succumbed to his disease at his home, as desired by him. After his death, the family met the health care team, and personally thanked everyone. They emphasized the need for the health care team to be trained in handling the psychosocial issues of adolescents, so that no live is lost due to their behavioral issues.

CONCLUSION : Behavioral issues are common in adolescents with cancer. Psychosocial and behavioral interventions will enable them to overcome the detrimental impact of a health crisis, strengthen the internal and external coping resources available to them and have the potential to minimize negative impacts as well as promote positive psychosocial adjustment. Health care professionals should be trained not only in the unique biology and treatment requirements of their cancers, but also their psychosocial issues and communication challenges, as the skills required are not adequately covered in the traditional adult or Paediatric training programs.

6. WEIGHT LOSS IN AN ADOLESCENT– BEYOND "ANOREXIA NERVOSA"

Arun Prasath

drtsarunprasath@yahoo.com

INTRODUCTION : Anorexia nervosa is a potentially fatal psychological eating disorder characterized by persistent restriction of energy intake, intense fear of gaining weight and distorted body image. In an adolescent with significant weight loss, evaluation for underlying medical conditions is essential even if a diagnosis of psychological disorder is being considered.

CASE HISTORY : A 14-year-old developmentally normal girl was brought with complaints of progressive loss of appetite and weight for 3 months. She had no constitutional symptoms. She had attained menarche 1 year back but had hypomenorrhea. She revealed being mocked by her friends for her chubby appearance following which she became obsessed with her body image and gradually started reducing her food intake. On examination, she was articulate and alert. Her height was 155 cm (below 10^{th} centile), weight 30 kg(below 3^{rd} centile) and BMI 12.5 (below 3^{rd} centile). Tanner staging of SMR was B4P4A4. She was cachexic and had a Grade 1goiter. She was diagnosed to have Anorexia Nervosa, but the possibility of hyperthyroidism was also considered due to the goiter.Investigations revealed microcytic hypochromic anaemia (Hb9.3). Total count, platelet count, fasting and post prandial blood sugar, serum electrolytes, LFT, USG Abdomen and Chest X-ray were normal. Serum TSH was <0.005 mIU/L (0.7-6.4 mIU/L). FT4 was elevated4.27 ng/dl (0.58-1.64 ng/dl). Anti-TPO antibody was 1243 IU/ml (<9IU/ml), Anti-Thyroglobulin antibody was 17.3 IU/ml (<4 IU/ml) and TSH Receptor Stimulating Antibody (TRSAb) 4.864(0-1.50 IU/L) too waselevated. USG neck showeda bulky thyroid with heterogeneous echo-texture and increased vascularity. Technetium M 99 scan revealed increased tracer uptake of 16%. Final diagnosis was Graves disease with Anorexia Nervosa.

MANAGEMENT : She was started on Carbimazole and gradual re-feeding. She was given psycho-education and discharged once weight gain was established. On follow up her appetite had normalized and weight gain was satisfactory.

DISCUSSION : The incidence of Graves disease in children is 1:5000. It peaks in the 11-15 yr old age group; there is a 5:1 female:male ratio.The clinical course in adolescents is highly variable. Thyroidomegaly may be minimal or absent. The typical eye and skin findings are seen only in 25% and the sympathetic nervous system symptoms in 55%. The earliest sign in some children may be behavioral disturbances. Documentation of elevated TRSAb can confirm the diagnosis. Treatment options are antithyroid drugs, radioiodine and thyroidectomy. Most studies report a remission rate of approximately 25% after 2 yr of antithyroid drug treatment in children. Therapy may be resumed

in case of relapse.

LEARNING POINTS : Co-existence of a medical disease and an eating disorder is well known. Hyperthyroidism typically causes increased appetite but the association between anorexia and hyperthyroidism has been previously reported. Anorexia Nervosa is usually a diagnosis of exclusion which can be made only after ruling out all possible organic causes. In the presence of an eating disorder, treatment of hyperthyroidism alone is not sufficient and persistent supportive therapy for the eating disorder must be continued.

7. PREVALENCE OF OVERWEIGHT AND OBESITY AMONGST SCHOOL CHILDREN IN BAGALKOT, INDIA

Umesh Ramadurg, Anamika Patel, Ashok Dorle, B.S. Mannapur

patel.anamika26@gmail.com

INTRODUCTION : Obesity is an abnormal accumulation of body fat, usually 20% or more over an individual's ideal body weight. Obesity is associated with increased risk of illness, disability and death. The potential public health issue that is emerging is the increasing incidence of adolescent obesity in developing countries, and the resulting socioeconomic and public health burden that will be faced by these countries in the near future. Obesity and overweight have become a worldwide epidemic, children who are obese are more likely to remain obese as adults, perpetuating the obesity epidemic. There is an urgent need to examine adolescent obesity and overweight across countries using a standardized international standards.

AIMS AND OBJECTIVES : To estimate the prevalence of obesity and overweight among the adolescent school going children. To determine the risk factors associated with obesity .

MATERIAL AND METHODS : In Bagalkot, India, a cross-sectional study was conducted among school going adolescents, of 15-17 years of age. The obesity and overweight were considered using an updated body mass index reference and socio-demographic and life style factors were determined using pre-structured questionnaire.

RESULTS : A total of 145 adolescents in the age group of 15 to 17 years were analyzed. Out of these ,91 (62.75%) subjects were males and 54(37.24%) were females. Majority of them were Hindus 139(95.86%) and 5(3.44%) were Muslims .About 107(11.72%) belonged to nuclear family and 38(26.20%) to joint family respectively. Among them 123 (84.82%) were vegetarians and 22(15.17%) consumed mixed diet. Majority of the students were day scholars that is 143(98.62%) and 2(1.37%) were residing in hostels .The mean height of the sample was 1.56 meter. The mean BMI of the sample was 20.24 kg/m^2.The overall prevalence of overweight among adolescents was 7 (4.82%) and obesity was5 (3.44 %).The prevalence of overweight was 3 (2.06%) among boys and 4(2.75%) among girls; 3(2.06%) and 2(1.37%) were obese, respectively. No significant gender difference for obesity prevalence was seen among children from a less privileged background, however, amongst children from affluent families, significantly more boys were obese as compared to girls.

CONCLUSION : Our data suggest that the prevalence of overweight and obesity varies remarkably with different socio-demographic and life style factors levels. Family characteristics play important role in predisposing the adolescent to overweight /obesity so there is need of co-operation and support from parents and the families. Preventive and supportive action needs to be taken to curb the problem of obesity among adolescents. Public health interventions at the individual and policy-making levels need to be instigated at the earliest, to tackle this problem in the country.

8. STUDY OF COMPARISON OF KNOWLEDGE OF RURAL AND URBAN ADOLESCENT GIRLS ABOUT MENSTRUATION

Prashant Kariya

drprashantkariya@gmail.com

INTRODUCTION : Menstruation is a normal physiological process indicating beginning of reproductive life but sometimes it is considered as unclean phenomenon in the Indian society. Insufficient, incorrect information regarding menstruation is often a cause of unnecessary restrictions in the daily normal activities of the menstruating girls. There is a vast difference in knowledge of rural and urban adolescent girls.

AIMS AND OBJECTIVES : There is a gross difference in menstrual hygiene in urban and rural areas. The study was done to find out the differences to ake necessary actions for improving menstrual hygiene.

MATERIALAND METHODOLOGY : A cross sectional study carried out among 400 girls from standard 8^{th} to $10^{th}$of school in Surat & South Gujarat during Jan 2018 to December 2018 by using pretested questionnaire to document the knowledge of adolescent girls about menstruation.

RESULTS : Age range of girls 13-17 and age of first menarche ranging 11-16 year of age. More than half (53 %) girls feels irritated at the time of menstrual period and 88% had regular monthly periods. 70% girls had history of ever experienced of severe lower abdominal pain and 34% had history of medication to relieve this pain. 82% girls in the urban and 57 % girls in the rural area used sanitary pads. 18% girls in the urban and 43% girls in the rural area used cloth and used the same after washing in the subsequent period. Satisfactory Cleaning of external genitalia was practiced by 96% of the urban and only 59% of the rural girls. 53% of urban and 84% rural girls were not visiting temple or having restriction of activities during the menstruation. This study found differences in hygienic practices followed by adolescent girls in urban and rural area.

CONCLUSION : Hygienic practices during menstruation were highly unsatisfactory in the rural area as compared to the urban area. Girls should be educated about the menstrual hygiene properly. Their routine beliefs and misconceptions regarding menstruation must be addressed by healthcare professionals.

9. A STUDY OF PROBLEMS OF ALCOHOLISM AND SUBSTANCE ABUSE IN ADOLESCENTS OF PROFESSIONAL COLLEGE

Umesh Ramadurg, Pooja Todalabagi, B.S.Mannapur, A.S.Dorle

poojatodalabagi@gmail.com

INTRODUCTION : The term 'adolescent' is an adjective describing a young person in the process of developing from a child into an adult. It is derived from the Latin verb 'adolescere' which means 'to grow up'. Alcohol is the world's third largest risk factor for disease and contributes to 4% of the global burden of disease. It is estimated that 2.5 million deaths each year are directly attributable to alcohol, with 9% of deaths in the 15- to 29-year age group being alcohol-related." Adolescence is the critical period when the first initiation of substance use takes place. Encouragement by peer groups, the lure of popularity, and early availability of many such substances make an adolescent an easy prey. In India, approximately 5500 adolescents practice substance use daily, some as early as when they are ten years old. In the US National Co-morbidity Study-Adolescent Supplement, over ¾ of adolescents (78.2%) had consumed alcohol by late adolescence. A high prevalence of tobacco use (39.5%) was reported among medical students of CMC, Vellore while a high prevalence of cannabis use was found in college students in Varanasi. Study conducted in Tirupati reported that the mode of consumption of tobacco was mostly in the form of smoking (85.5%), and (61.5%) of subjects were smoking 6–10 cigarettes per day. Regular alcohol use, binge drinking and other risk-taking behavior such as smoking, substance use and risky sexual behavior emerge in adolescence and there is evidence that these behaviors tend to cluster together. Early identification of adolescent risk factors may be helpful in preventing the risk.

AIMS AND OBJECTIVES : 1.To estimate the prevalence of substance abuse among adolescents 2.To identify the risk factors responsible for substance abuse.

MATERIALS AND METHODS : A cross sectional study was conducted among first year medical students. All the first year students (150) were included for the study. Out of 150,114 volunteered to answer a pre structured and tested questionnaire which was used to collect the data.

RESULTS : Out of the 150 students 114(76%) agreed to participate in the study. Of these 114 students, the male participants were 84.2%(n = 96) and female participants 15.7% (n = 18) .. The majority of the students were Hindu (82%). Most students (97.3%; n = 111) lived in hostel. Out of the 114 participants, 91(79.8%) revealed that they consumed alcohol. 105 (92.1%) out of 114 respondents revealed that at least one of their family members consumed alcohol.40 students (35.1%) revealed about smoking habit. When asked about their reasons for smoking, 57.5% students claimed for getting pleasure. Nearly 37.1% of students smoked daily whereas 22 students (62.8%) smoked occasionally.

CONCLUSION : Peer group pressure is the key source of initiation of alcohol consumption. The development of risky behavior such as alcohol consumption and tobacco use at young age indicate higher chances of getting addicted. Thus there is a need to educate the youth regarding the consequences of such habits.

10.A PROFILE OF HEALTH STATUS OF ADOLESCENTS ATTENDING OPD OF TERTIARY CARE HOSPITALS IN NORTH INDIA

Roli Srivastava, Tanu Midha, Kriti Singh

rolishalabhmohan@gmail.com

INTRODUCTION : Adolescents constitute over 20% of Indian population as per NFHS 4. It's a special age group with dynamic growth, emotional turbulence and hormonal shoot up. This period is also known to be a second chance for growth and catch up growth for those children who have experienced a nutritional deficit in their early life. It's the period of increased nutritional requirement for the growth and pubertal spurt. Hence the study on profile of the health status was performed.

AIMS AND OBJECTIVES : To assess the health status of the adolescents attending the Adolescent clinic

MATERIAL AND METHODS : Type of study: A cross-sectional study was conducted in the adolescents, both boys and girls attending the Adolescent O.P.D. of GSVM Medical College, Kanpur. Location: Adolescent O.P.D. situated in the LLR Hospital OPD block, of GSVM Medical College, Kanpur. Time Duration: from January 2019 to May 2019. Inclusion criteria: Adolescents of 10-18 years of age attending the adolescent clinic were included in the study.Exclusion criteria: OPD entertains cases from 8 years to 20 years. Adolescents less than 10 and more than 18 were excluded from the study.Statistical analysis: Categorical variables were analysed using percentage and chi-square test. Statistical analysis was done using SPSS 22.0

RESULTS : Total of 73 adolescents were observed. There were 57.53 %females (42) and 42.5% males (31) included in the study. SMR scores varied from I to V. According to BMI % iles of IAP growth charts, 15.1% (11) were overweight and 10.95% (8) were found to be obese. Delayed puberty was seen in 5.48% (4) in all, 3 in females and 1 in males. prehypertension was seen in 4.10% (3 males). Commonest complaint among attendees was of poor school performance 23.29% (17) which included poor concentration and poor memory too. Anger tantrums were the next common complaint seen in 15.06% (11). Short stature was the commonest physical problem.

CONCLUSION : Adolescence is a stressful period of life, marked by rapid and dramatic physical development and sexual maturation. Height is an important aspect of personality for which adolescents are concerned. Studies, career and behaviour problems especially aggression is the main concern of parents. Counselling has an important role in dealing with all adolescent issues, not only behavioural and emotional but also in the physical problems.

11. SCREENING FOR PRESENCE OF EATING DISORDERS IN ADOLESCENT AND YOUNG FEMALES

Sunita Manchanda, Sukhbir Pal Kaur, Deepanshi Kathuria

s_manchanda04@yahoo.co.in

INTRODUCTION : Eating disorders are defined as most common psychiatric problem affecting the young women which may result in significant biological, psychological and social complications. Mostly seen in adolescents and young adults and are 10 times more common in females. They are mainly of three types- Anorexia nervosa (AN), Bulimia nervosa (BN) and Not Otherwise Specified Eating Disorder (NOSED). "All adolescents should be screened annually for eating disorders and obesity by determining weight, stature, and asking about body image and dieting." (GAPS- Guidelines for Adolescent Preventive Services, 2009). In India exact incidence is not known because of limited studies, but for last 15yrs there has been increase in, especially because of TV, social media and success related to super thin models who act as role model for adolescents. Nature of disease and unwillingness for self-disclosure makes accuracy of statistics difficult. Hence, we chose online confidential survey as a screening tool from a limited population, who could be called back in case of positive results for confirmation of the disease.

AIM AND OBJECTIVES : To screen young female of age group 15-25 yrs for Eating Disorder by using SCOFF questionnaire. To see the pros and cons of online survey in our setting.

METHODOLOGY Type of study : Survey (Online) Population : Female of age group 15-24yr from 12^{th} to college going students from urugram which further divided into Group A (15-19 Yr) and Group B (20- 24yr). Proper consent was taken and confidentiality was maintained. Tool : The SCOFF questionnaire by Morgan JF et al. It is a simple and easy to administer questionnaire with five questions and answer in the form of yes or no by putting a tick mark. Scoring: One point is assigned for every 'yes'; a score greater than or equal to two (≥ 2) indicates a possible case of anorexia nervosa or bulimia nervosa.

RESULTS : Total no of female population under study was 50. No of females in Group A were 32 (64%) and 18 (36%) in Group B. Total score ≥ 2 was found in 21(42%) with 14 (67%) in Group A and 7 (33%) in Group B .As per our results 42% of population were having the possibility of eating disorder and more in younger age group which is of a great concern. The population screened positive was asked to complete EAT 26 for confirmation of eating disorder and the results are awaited.

CONCLUSION : Eating disorders is a disease of emerging concern in our country. Simple screening test is needed to increase the user participation. Scoff questionnaire is an appropriate screening tool but needs confirmation of disease by other specific method and online surveys can be useful but have limitation of getting it confirmation by specific test.

Confirmation of disease and planning any therapeutic intervention will require interview in clinic setting. Using this tool in primary care setting may give us better information.

Further studies on a larger scale in primary care setting and online studies may help us to know incidence of eating disorder in our population.

12. INTERNET ADDICTION : CONNECTING OR DISCONNECTING PEOPLE

Srinidhi M, Farhas Sabha, SM Prasad, M Govindaraj ,

srinidhi.zxy@gmail.com

INTRODUCTION : Identity hacked:losing yourself to social media! If in the past we were our job, relationship, favorite band or a car brand, we are now also our twitter, instagram, facebook. We see people losing their ability to be alone and feel, emote, participate or witness life by themselves. Instead its "ooh what a great moment. Let me capture and let me share it. It's as if people feel like they have to be their own reality show and that can be quite unhealthy. Yes, social media has become toxic and lost all sense and purpose. Focusing on the adolescent population, as it is an important period of rapid development and too few of us are paying attention to how our teenagers use of technology is much more intense and intimate than a 3-year-old playing with dad's I phone and how it is affecting them like promoting anxiety, aggressive behavior and lowering self esteem. Due to indirect communication kids are missing out on very critical social skills, thus undermining their social relationships. The feeling of well being and euphoria while at the computer or while using a mobile phone, the cyber addiction, gambling, gaming, cyber relationships, instant messaging, internet research ,is it all really worth it to risk our personal relationships, mental and physical health to just a tool? Hence lets THINK BIG-SPREAD MORE AWARENESS about positive and negative effects of internet addiction, for a computer or a mobile phone is just a tool like a pick or a shovel! The medium used is not the problem in itself, the problem mainly resides in using the tool to excess.

AIMS AND OBJECTIVES : 1)To determine the effect of internet addiction on social relationships in adolescence2)To determine the gender difference in internet addiction.

MATERIALS & METHODS : 1) A quantitative, cross-sectional study was carried out on adolescents between the age range of 15-19yrs.2) Two questionnaires were used, the first one being the standardized questionnaire on internet addiction by Dr Kimberly Young, the second questionnaire is predesigned, pretested and structured by the author.3) Consent was taken from all the participants in the study.4) Sample size:200 collected from 5 different school and pre-university students, in which 100 were males and 100 were females.Eligibility criteria: a)Inclusion criteria**:** Adolescent girls and boys between 15-19 years.b) Exclusion criteria: Students who are not willing to take part in the study Statistical analysis: Data obtained were compiled and analyzed using t test.

RESULTS AND CONCLUSION: There is a significant correlation between internet addiction and deterioration in social relationships in adolescent boys and girls. There is no gender difference between adolescent boys and girls in internet

addiction.Awareness programs should be organized in schools and colleges to educate adolescents about the pros and cons of internet.

13. ADOLESCENT TUBERCULOSIS: CHALLENGES ENCOUNTERED !

Jayashree K

jayashreedoc@gmail.com

INTRODUCTION : Adolescent tuberculosis is likely to be more infectious than in children, Tuberculosis in adolescents and young adults are considered an at-risk group for community spread of tuberculosis. During adolescence the process of transition from non-contagious childhood forms of tuberculosis, to contagious adult-type tuberculosis occurs. Adolescents often develop atypical forms of pulmonary disease that are more difficult to diagnose. There are many treatment issues for adolescents, including intolerance of anti-tuberculosis drugs, habits that can affect management such as smoking and drug use, and decreased adherence to treatment regimens. As per the Global TB report 2017 the estimated incidence of TB in India was approximately 28,00,000 accounting for about a quarter of the world's TB cases. Adolescent females have higher incidence of tuberculosis in countries with high incidence of tuberculosis, as compared to general TB profile in other age groups where males have higher incidence.

CASE REPORT : A 16year old adolescent girl presented with cough with purulent sputum, fever for 2 weeks and breathlessness for 2days. Father was diagnosed with tuberculosis 1year ago. She was evaluated for tuberculosis at a hospital in Kerala 4months back with positive Mantoux test (30mm) but sputum was negative for AFB. Hence she was not started on Anti tubercular treatment. On clinical examination, she was conscious with pulse rate :50/min (bradycardia), BP: 98/60mmHg, respiratory rate : 34cycles /min, temperature : 94.6^{0}F (hypothermia), CFT 3 sec, cold peripheries and excessive seating was present. Pallor present. Anthropometry: Height :160cm, weight 49kg (between 50th -75th centile as per IAP growth chart). Respiratory system: Air entry decreased in bilateral mammary axillary and infrascapular areas, Normal vesicular breath sounds heard in other areas. Other systems were normal. Hemoglobin:9.2gm/dl, TLC:6500cells/mm^{3}, Platelets: 3.92lakhs, Peripheral smear showed: N :89.6%, L:7.3%, M:0, B:2.9% microcytic hypochromic anaemia, anisopoikilocytosis, polychromatophils with neutrophilic leukocytosis. ESR: 74mm/hour, S. creatinine:0.5mg/dl, LFT: TB -0.28mg/dl, DB-0.12mg/dl, TP-8.4gm/dl, S.albumin -3.0gm/dl, AST-13U/L, ALT-10U/L,ALP:77U/L ,LDH-315, Sodium:138 mEq/L,Potassium:4.19mEq/L. Serum T3 : 0.494 ng/ml, Serum T4 :7.42µg/dl, TSH: 2.04µIU/ml. Coagulation profile was normal. Chest Xray: showed bilateral moderate pleural effusion (left>right). HRCT thorax showed: peripherally enhancing encysted left large pleural effusion with adjacent collapse of ipsilateral lower lobe s/o empyema, mild mediastinal shift to the right side. Mild right pleural effusion and mild pericardia effusion s/o infective etiology? tuberculosis.MRI of brain with screening of abdomen was done to rule out tubercular involvement of brain, abdominal organs and reproductive system. Pleural fluid analysis showed exudate (as per Light's criteria). Gastric aspirate and pleural fluid analysis were negative for AFB. CBATT (Catridge Based Nucleic Acid Amplification Test) was negative. Pleural fluid amylase :18, CEA:0.382ng/ml, HIV: nonreactive. Serum cortisol:24.94mcg/dL (sent after starting hydrocortisone), pleural fluid ADA: 82 U/L. ECHO: minimal pericardial effusion <150ml.Emergency management with fluid boluses and noradrenaline infusion was started in view circulatory shock along with Meropenem and Vancomycin and BIPAP support. She had hypothermia with shock hence adrenal insufficiency was considered and inj hydrocortisone was given. Intercostsal drainage tube was inserted for left sided pleural effusion (image 2). Her blood pressure picked up with ionotropic support but she had persistent bradycardia, sweating and hypothermia even on Day 4 of admission, hence cardiology opinion was sought, cardiac enzyme levels were normal and during the course her vitals were stabilized. Her thyroid function tests were suggestive of low T3 levels diagnosed to have sick thyroid syndrome and was treated with thyroxine supplements for short duration. Due to high index of suspicion and increased ADA levels she was started on ATT as per revised RNTCP protocol (Rifampicin, Isoniazid, Pyrazinamide, Ethambutol) along with Prednisolone. Repeat chest x-ray and ultrasound of chest showed resolution of pneumonia as well as pleural effusion. During follow up visits she was doing well, gained weight and on continuation phase of ATT (Isoniazid +Rifampicin) which were given for 10months from DOTS centre.

LEARNING POINTS : In this case, there was tubercular pneumonia with pleural effusion but microbiological tests of sputum, gastric lavage/pleural fluid could not isolate Mycobacterium tuberculosis.She had positive clinical symptoms with radiological findings, contact history and Tuberculin skin test being strongly positive. Based on Light's criteria there was empyema with lymphocytic predominance with pleural fluid adenosine deaminase levels >40U/L (82U/L) and CEA 0.3ng/ml. Hence she was started on anti-tubercular therapy with 4drugs (HRZE) for 2months followed by continuation phase with 2drugs (HR). All attempts should be made for definitive diagnosis of Mycobacterium tuberculosis from body fluids including CBNAT, and Light's criteria with pleural fluid ADA and CEA will definitely help in etiological classification of pleural effusion

14. RISK FACTORS OF STUNTING AMONG ADOLESCENTS ATTENDING ADOLESCENT O.P.D OF TERTIARY CARE HOSPITAL IN NORTH INDIA

Roli Srivastava, Tanu Midha

rolishalabhmohan@gmail.com

INTRODUCTION : Adolescence is a stressful period of life, marked by rapid and dramatic physical development and growth, including sexual maturation. Adolescents start to view themselves very critically, mostly being influenced by media and socio-cultural ideals. An adolescent's physical appearance and body image are an important part of his/ her identity and self-

worth. Height is an important aspect of personality and body image of which adolescents are especially concerned. Stunting may be due to various causes of which some are preventable if identified in time. Prevalence of stunting in under five children as per NFHS-4 is 38.4%. This may be carried forward in the adolescent years. Counseling has an important role in dealing with all adolescent issues, not only behavioral and emotional but also in the physical problems. Hence, this study was conducted to look into the height concerns of adolescents, prevalence of stunting and the reasons behind it.

AIMS AND OBJECTIVES : To find out the risk factors of stunting among adolescents attending adolescent clinic.

MATERIAL AND METHODS: Type of study: A cross-sectional study was conducted in t he adolescents, both boys and girls attending the Adolescent O.P.D. of GSVM Medical College, Kanpur Location: Adolescent O.P.D. situated in the LLR Hospital OPD block, of GSVM Medical College, Kanpur Time Duration: from January 2019 to May 2019. Inclusion criteria: Adolescents of 10-18 years of age attending the adolescent clinic were included in the study. Exclusion criteria: OPD entertains cases from 8 years to 20 years. Adolescents less than 10 and more than 18 were excluded from the study. Statistical analysis: Categorical variables were analysed using percentage and chi-square test. Statistical analysis was done using SPSS 22.0

RESULTS : Among boys 32% were found to be stunted whereas in girls 11.9% were found to be stunted. Stunting was significantly associated with gender (p value 0.043). It was not significantly associated with wasting (p value 0.123). The causes identified were nutritional, genetic causes and hypothyroidism amongst hormonal.

CONCLUSIONS : Stunting was found out to be a common problem among adolescents. Stunting may be due to various causes of which nutritional and hypothyroidism are common and preventable, if identified and managed in time. Early identification of the cause, counselling for realistic expectation and early intervention is the key to successful management.

15. ADOLESCENT PARENTING; A DOUBLE EDGE SWORD

Vinaykumar Gogi, Nagamani Agarwal, Harish NV, Rajani A, J Anand

savinayasjmch@gmail.com

Parenting style is a psychological construct representing standard strategies that parents use in their child rearing which influences psychological well being of adolescents. Quality of relationships adolescents have with their parents is the most consistent predictor of adolescent mental health and well being. According to UNICEF –2012, each year 20% of adolescents experience mental health problems.

CASE 1 : A 17 years old male adolescent studying IInd year Pre-college brought with alleged history of consumption of 20 tablets of acetaminophen 650mg strength 2 hours prior to admission. His weight and height were 73 kg and 173 cms respectively with BMI- 25. Vital parameters and systemic examinations are within normal limits. There were multiple healed scars of hesitation cuts on left wrist. He was admitted in same hospital 3 months ago with alleged history of consumption of tablet febuxostat (uricosuric drug) which is hepatotoxic drug. He was managed symptomatically and was referred to psychiatric counselling. On further enquiry, parents gave history of recurrent non-fatal suicidal behaviours (NESB) in the past with deliberate self harm and threatening behaviour, for secondary gains which were often fulfilled by his parents. Treatment was carried out as per the standard protocol; N-Acetylcysteine was given as consumption dose was above the toxic dose of 150mg/kg/dose. Liver function tests, coagulation profile and other relevant investigations were monitored. Psychiatric counselling revealed- act of suicidal attempt were secondary to behavioural issues, probably influenced by peer groups, social media or positive reinforcements by parents. At discharge, he was started on Aripiprazole as per psychiatrist advice with regular follow up for psychotherapy.

CASE 2 : 13 years old male adolescent presented with history of recurrent episodes of giddiness, followed by tonic-clonic movements of whole body with eyes tightly closed, lasting for 2 to 3 minutes and with post-ictal drowsiness or confusion. These bizarre behavioural episodes were observed during the last 12 to 14 days. Mouth frothing, bowel or bladder incontinence was not observed during these episodes. Physical examinations and all relevant investigations were normal. Psychiatric opinion revealed presence of stressors as sexual harassment by peers at school and specific learning disorders with respect to mathematics. On further interviewing, child gave history suggestive of authoritarian parenting from mother and hence doesn't want to share his problems with mother. But stressors did not resolve even after sharing with father, which concluded that “mental distress converting into physical symptom and hence diagnosed as conversion disorder” manifesting as bizarre behaviour.

CONCLUSION : Parental autonomy support and relatedness are associated with higher adolescent self system. Problems in parenting arise due to lack of skills, so parents should be trained in parenting (life skills training). Life skills training has a significant effect on positive mental health and self esteem of vulnerable adolescents which in turn prevents both parents and adolescents from psychosocial, medical and financial burden.

16. STROKE IN YOUNG SECONDARY TO SUBSTANCE ABUSE IN ADOLESCENT AGE GROUP

Vinay KG, Lakshmi, Gayatri Devi

chaitra_chtr@yahoo.co.in

INTRODUCTION : The most common drugs abused in India are: 1.Nicotine 2. Alcohol, 3. Ganja, charas. These drugs can cause many cardio vascular and cerebro vascular accidents. Each drugs cause interaction with the brain and vasculature predisposes even young healthy people to ischemic or haemorragic stroke. Cocaine and amphetamine have strong association with stroke. Some of the risk factors include poor parental supervision poor parent–team communication, family

conflicts. Peer pressure is also a major risk factor.

CASE HISTORY : A 17 year old male who was apparently normal till a day before, developed sudden onset of weakness of right upper limb and lower limb and inability to speak and breathing difficulty. Patient did not have complaints suggestive of cranial nerves impairment or cerebellar or autonomic system involvement. There was no history of fall or fever or rashes or giddines. No history of previous hospitalizations. There was a history of alcohol intake and marijuana in the company of his friends, often since six months. He belonged to a single parent family. On examination, patient was not able to obey oral commands. Vitals were normal, BMI falls between -2 to -3 standard deviation. BP 110/80mmHg. His breath at the time of admission smelt of alcohol, clubbing+Systemic examination: HMF- conscious, oriented. Cranial nerves- Normal. Motor system examination revealed girth of muscles in both upper and lower limbs to be normal, decreased/ increased tone and decreased power of 2/5 in right upper and lower limbs, Right Plantar was extension, LT withdrawal present. Right upper and lower limb reflexes diminished. No signs of meningeal irritation. Clinically, a diagnosis of right hemiparesis with aphasia, probably due to left MCA territory infarct, secondary to substance abuse and alcohol was made.Carotid and vertebral Doppler: RT: increased velocity noted in CCA and ICS LT:Left vertebral could not be assesed Loss of normal spectral pattern with high resistance flow noted in ICA and CCA- to R/O digital obstructionMild luminal narrowing noted in visualised position of TCA.. MRI Angiography Narrowing of left TCA throughout AS length.Thrombosis of supraclenoid segment of left TCA and hole of left MCA. Echocardiography and lipid profile was normal

DISCUSSION : Cannabis (Ganja) also known as marijuana, is a psychoactive drug from the Cannabis plant used for medical or recreational purposes. Cannabis ingestion can result in psychiatric reactions, including behavioral abnormalities and risk of schizophrenia, cardiovascular effects, like tachycardia, postural hypotension and hypertension. Also due to the increase in carboxy-haemoglobin levels there is decrease in the oxygen carrying capacity. Many studies reveal that though cannabis drug, is the most frequently consumed, only few have been described with strokes. In our case, the most relevant data was the association of stroke with the use of Cannabis. It has a very high lipo solubility and persists in fatty tissues.Alcohol ingestion could also have contributed, but the relationship between alcohol and ischemic stroke is complex is controversial. The most probable mechanism of stroke described in cannabis abuse are vasospasm and postural hypotension with abnormal regulation of the brain blood flow. In our patient, there was definite history of alcohol consumption and postural hypotension. Following treatment with aspirin, clopidogrel, physiotherapy and further management of stroke, our patient gradually improved, though aphasia persisted. He was also counseled about his high risk behavior and is still on therapy. Family counseling was also initiated.

17. ASSESSMENT OF KNOWLEDGE AND PRACTICE OF MENSTRUAL HYGIENE AMONG ADOLESCENT GIRLS IN GOVERNMENT SCHOOLS OF JABALPUR AND IMPACT OF HEALTH EDUCATION ON THEM DURING 2018-19

Preeti Singh

awsmpreeti123@gmail.com

INTRODUCTION : Menstrual hygiene is an issue that has not received adequate attention in reproductive health, water sanitation, hygiene sectors in developing countries. Menstruation and hygiene practice are clouded by taboos and sociocultural restrictions resulting in poor hygiene. Unhygienic practices may result in increased vulnerability to reproductive tract infections. Use of sanitary pads may be increasing but not among girls from rural and poor families. Girls should be educated about menstruation and hygiene through health education in schools. Data on their current level of knowledge and practices are beneficial for planning health awareness programs.

AIMS AND OBJECTIVES : To elicit belief and source of information regarding menstruation among adolescent girls. To find their menstrual hygiene practices. To study the change is knowledge level and practices after health education on menstruation and hygiene.

METHODS : A school based cross sectional study was employed among government schools of Jabalpur. Study Period March 2018 - December 2019 Sample Size 400 girls of Government Schools (11-19 years) Data Collection is done between March 2018 - Dec. 2018 using structured questionnaire. Health education was given by audio visual AIDS

RESULTS : In this study out of 390, 190 girls had good knowledge and 120 girls had good hygiene knowledge and belief scores compared to baseline. Significant improvement was also observed in overall good practice including improvements in use of sanitary pads, frequency of changing pads, methods of disposal, restrictions practiced during menstruation and less episodes of reproductive tract infections

ADOLESCENT HEALTH ACADEMY IAP

ACTION PLAN 2019

Theme: Adolescent Health- New Horizons

Team 2019 hopes to attain new horizons in Adolescent Health Care. In 2019, we aim to focus on the following:

1. Establish adolescent health services in all parts of the country
2. Encourage research and publication in adolescent health
3. Reach out to the community and health care professionals through media based activities and programs
4. Launch interactive AHA IAP Website
5. Increase AHA IAP membership

AHA IAP Team 2019 has formed the following committees to fulfill our objectives:

1. **Scientific Committee**

   To plan and implement scientific programs in respective states including IAP Mission Kishore Uday 2018-19 and IAP Online Course on Basics of Adolescent Health

2. **Publications and Research Committee**

   To revive publication of AHA E- Newsletter 'Adolescent Today' and guide in planning research studies

3. **Media Committee**

   To project and broadcast AHA IAP activities through online and offline media

4. **Website Committee**

   To upload academic and scientific information on the website including all AHA modules and plan interactive case discussions

5. **Membership Drive Committee**

   To motivate IAP members and adolescent health professionals of various disciplines to join AHA.

Adolescent Health Academy Indian Academy of Pediatrics

MISSION STATEMENT

Adolescent Health Academy IAP aims for optimal, physical, psychological and social well being of all adolescents. Mission statements of AHA IAP are:

1. Professional Education and Improvement

Adolescent Health Academy IAP aims to encourage the knowledge, study and practice of the science of adolescent health by establishing and maintaining libraries, reading rooms, laboratories and research centres. This in turn is aided by printing and publishing an official Journal of the society, books, periodicals or publications on adolescent health. For promotion of its objectives AHA organizes conferences, lectures, meetings, seminars and exhibitions

2. Membership Service

The membership of the Adolescent Health Academy is open to the members of Central IAP and other professionals (both medical and non-medical) working in the field of Adolescent Health. The membership of AHA is of two categories namely: (a) Life (b) Affiliate Life

Only those who are Life Members of the IAP are eligible for Life membership in the Adolescent Health Academy.

3. Education of Parents and Public

Adolescent Health Academy aims to partner with parents, grandparents, other family members, guardians, teachers, schools, NGOs, youth and the community to promote adolescent well being. AHA conducts life skill education programs, parenting seminars, school programs, health camps and distributes handouts to build awareness about adolescent health related issues.