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Inhalant Abuses in India: A Review

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Abstract

This review article explores the studies of inhalants and inhalant misuse in India. Since much research is focused on illegal drugs not much work had concentrated on the commonly available inhalants. The abuse of inhalants is common phenomenon in the world. In this review, we will explain why these inhalants addiction is an inalienable thing which depressed youths can't avoid. Then we will look into various inhalants commonly used and also into various case studies available in the literature hence knowing the abuse of inhalants among youths and techniques employed by them to get a kick.

Keywords: *Inhalants, abuse, volatile solvents, youth.*

Introduction

People inhale vapors of toxic substances to attain an elated experience as told by Scott Silvia and L Cruz. [1] By reaching this euphoria state makes them forget their past, worries. Therefore, it was a necessity to look into inhalants used by youths in India. Inhalant mishandling has been present in India since 1970s, studies done notifies us the abuse has increased. It has been on the rise within students who are among low strata of the society and those who have broken families where students are forced to live on the street, rag pickers, who are unemployed, who gets into groups of gangs. Commonly used inhalants in capital of India are the Eraz-Ex diluter and whitener, made by Kores, commonly seen all through Delhi reported in his article by Gigengack .[2] A typical substance abuser can be either a person with academic failure or a dropout with socio-economic factors stated by Kumar, Suresh et al [3]. Leading News outlets have reported about the addiction to whitener, The Hindu[4] ,The Times of India [5],The New Indian Express.[6]

According to report of an activist of child rights Raj Mangal believed "that closely 50,000 children of streets with no support and the lakhs of others who have some care available, a vast majority are into substance abuse". This shows the staggering rise of the children which can be affected with inhalants. The method the youth follow is mainly by sniffing or by pouring the whitener fluid on a cloth furthering using it as an inhaler, giving them elevation of rejuvenating experience for some hours as reported by The Hindu.[4]

Inhalants

Inhalant is a substance which is intentionally inhaled and prominently volatile for the purpose of triumphing an ecstatic state which has been reported worldwide highlighted by Ballard [7]. From past 2 decades, inhalant abuse is an alarm raising problem among children and teenagers mostly seen who live in streets (gullies) and backward villages across the world as pointed out by Praharaj, Verma, P, & Arora, M [8]. Coping with NIDA publications dated Feb 2017 has highlighted that these substances are chemical substances which have the capability to affect central nervous system and can delay brain activity. The main reason behind inhalant abuse addiction is availability of these dangerous chemicals in numerous common products such as petrol, glue, nail-polish remover, whitener (writer correction fluid), paint strippers, dry cleaning fluids, spray paints, deodorant sprays and electronic contact cleaners and so on, as pointed out by Weir based on addiction in Canada. [9-10] The reason behind this epidemiology of this inhalant abuse was because of their low cost, ease of availability and lack of legislative control over control

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and acquisition pointed out by Dindwiddie.[11]

When it comes to the chemical nature of this inhalants, hexane which affects peripheral nervous system, toluene and nitrous oxide which cause both central and peripheral nervous system purported by Charles W. Sharp and Fred Beauvais.[12(pp1-8)] Symptoms of inhalants at acute level resembles to alcohol intoxication which include excitation, agitation, drowsiness. Increasing intake of inhalants further leads to dizziness, ataxia and disorientation. At extreme level of abuse leads to hallucinations, muscle weakness, insomnia, nystagmus (eyes make repetitive movements). Charles W. Sharp and Neil L. Rosenberg have highlighted that at chronic level abuse it leads to serious complications like loss in weight, disorientation, and coordination impairment [13(pp 117 -120)].

Modes of inhalation

Separate studies by Weir, McGarvey, Ford found that these inhalants are taken by self-administration where chemical like fuels, solvents and adhesives like glue, acetone and butane are inhaled by nose referred as sniffing, breathing fumes from an inhalant-soaked cloth mainly nitrate canisters or gas dusters bloated in the mouth termed as huffing, breathing fumes from inhalant like paints and adhesives are placed in a plastic bag seized and forcefully inhaled by mouth termed as bagging these studies had pointed out that most of the cases were seen in other countries like Mexico, Canada, USA, South Africa, Australia, United Kingdom, Croatia and Latvia.[10,14- 15]

Typewriter correction fluid (TCF)

As there was no significant statistical data to reveal the usage of typewriter correction fluid in India but there are some cases which has been published in recent years. Because of its low cost and ease availability without any further restriction from drug and department stores use of this type of inhalant was increasing enormously. Symptoms of using TCF depend upon the mode of exposure for example if skin is exposed then symptoms like appearance of first and second degree burns, severe rashes and erythema. If intestine is exposed then related symptoms like Nausea, Vomiting, diarrhea, agitation, euphoria, headaches, dizziness and muscle weakness. If respiratory tract is exposed signs are similar to intestinal affects and sometimes leads to coma and sudden death as explained by Pointer [16]. This inhalant consist of trichloroethane, trichloroethylene at a blend of 50-60% and toluene. These chemicals at extreme levels may leads to sudden death stated by Done. [17] A study examined 10 children aged 11 to 12 years and are drop out of school and working as labor. Waraich et al had told that the children were inhaling not only TCF but also petrol, nail polish remover, tobacco and alcohol [18]. A study evaluated 45 homeless children aged 6 to 14 years old in Delhi who were the victims of misusing TCF covering high toluene content told by Seth et al.[19] Gupta et al had pointed that two children misusing TCF and an adhesive which is used to fix punctured tires.[20] A national study on 100 children living in footpaths, platforms and streets, from that 83% of children were commonly misusing products containing toluene which was TCF by Ray. Further he reported another clinical data in 2011 that more than 33% of adolescence who were school children and school dropouts are using TCF as a primary inhalant. [21,22] A study conducted to examine the inhalant abuse among street children in Delhi revealed that about 96% of them were regularly inhaling volatile substances; from those volatile substances 83% of them were using TCF with toluene content by Dhawan et al. [23] Another case reported that 9 children aged 10 - 17 who were school dropouts have been huffing TCF regularly and they found more than 45 children were using TCF and paint thinners as inhalants in New Delhi by Praharaj.[8]

Glue/adhesive Sniffing

Adhesives mainly glues have been misused by children in India and many other countries. It was found that these adhesives have been misused by sniffing so the term Glue sniffing has been appeared in many blogs and previous papers. Chemicals like toluene, acetone, n-hexane, trichloroethane, trichloroethylene are existing in these adhesives. Bass and Mondal proved in separate studies that sudden sniffing death syndrome is the outcome of many chronic glue sniffing cases. [24, 25] A case by Sood, where a 16-year-old boy was admitted in emergency ward, symptoms he was experiencing were severe abdominal pain, vomiting and showing irregular respiration, hypertension. Hypertension in intracranial pressure is due to possibility of toluene. Later the boy died on 7th day of admission because of intoxication. Other was 17-year-old male admitted to hospital with severe abdominal pain and renal failure and later he confessed that he had been regularly sniffing glue for kicks. [26] Another meta-analysis study by Mondal states that streets boys living in railway platforms and footpaths of West Bengal, Bhutan, Bangladesh were addicted to

glue tubes, cans and rubber cement (type of adhesive) are favorite particulars of children. They also demonstrated that sniffing or huffing of glue/adhesive enhance the genotoxic affect in epithelial cells of mucosa of these children which suggest that there might be genetic alternations that may cause mutagenic events and cause cancers [25]. Another case illustrates a 22-year-old man covered his face with plastic bag having large amount of glue in it. This person died while he was carried to the hospital, the reason of his death was sudden sniffing death which occurred by cardiac arrhythmia (mainly ventricular arrhythmia) and there was a presence of toluene 'was' demonstrated in blood and liver told by Jayanth et al in his study [27].

Gasoline

Thousands of children and teenagers were inhaling a vast varieties of organic solvents in order of achieving euphoric state. Those organic solvents include highly pressurized liquids which are aerosols like dry cleaning, lighter fluids and gasoline (petrol, diesel and kerosene). Symptoms and signs include euphoria, sleeplessness, changes in psychological activity because of toxic manifestations in central nervous system, multiple manifestations and sometimes leads to encephalopathy. A case assessed and reported that 15 teenagers aged 17 were sniffing cloth soaked in petrol and these had been identified by one of the boy showed psychotic behavior because of chronic inhalation and later hallucinations, illusions, amnesia and delusions have been observed in other students stated by Mahal [28]. Another case reported that a 13-year-old girl was addicted to fumes of petrol, later she started sniffing cloth soaked in petrol and kerosene for one year and signs of becoming violent, pleasant feeling, loss of appetite concluded that she was experiencing inhalant abuse and was later confirmed by interviewing by Pahwa [29]. Another case by Joshi and Vankar was about a 10-year-old boy huffing and sniffing petrol from vehicles, his parents observed over activeness, hangover like behavior, dizziness, restlessness and inattention [30]. In other study, reported by Gautam a 22-year-old boy with a history of sniffing kerosene, petrol and diesel for past eight years on daily basis and on examination revealed poor grooming, delayed speech, insomnia and increased psychotic activity. Later the boy was treated boy with Clonazepam 0.5mg [31].

Conclusion

Inhalants abuse, one may overlook due to less awareness around this topic should not be rejected as normal issues faced by the young but should be given utmost care when dealing with them.

Researchers focus highly on the illegal drugs which has greater effects, they often overlook on inhalants since it is not used as much as other prohibited drugs but these inhalants overuse can turn deadly for anyone who does not think so, studies by Charles Wm. Sharp and his colleague have proven this. Hence our focus is to get back to basic items which are available in any stationery stores e.g. whitener, glue, nail polishers etc. which have been manipulated by deceived youths who think this as a source of excitement. Also we need to look into cases of acute users and chronic users of inhalants since we have to see the results of how exposure to these volatile solvents on long term affects young people, therefore a distinction has to be made on long and short term effects of these solvents. This has been a question long before, Charles W. Sharp and his colleague had discussed about these in their early studies.[12(pp46-48, pp33-37)] But the awareness about inhalants has not reached layman due to generation gaps, therefore government agencies, NGOs and other health care groups should educate parents, teachers and adolescent ones about the growing menace of this abuse. Also in this review we had discussed about the symptoms which can be identified if a person is addicted, hence on knowledge of these symptoms any one close to the student can counsel or report to elders or authorities.

Further bills should be passed in the parliament regarding ban of certain inhalants which can be toxic when overused. Since these inhalants are freely available hence the misuse is vast. Bio-friendly chemical components should be used as the composition for these volatile solvents. Finally, extensive research has to be carried out in these fields to get the accurate data about users of these inhalants, Mahal and Pahwa in separate earlier papers had highlighted this need for data [28,29]. Reasons attributing to the lack of data could be less awareness concerning volatile solvent misuse, among healthcare professionals and parents. Clinical based studies regarding addiction of these inhalants among street children, abandoned kids should be taken into consideration. If any of the youths had been found using these substances of abuse they should be placed in de-addiction centers where they should be monitored, their

progress recorded.

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References

1) Scott Bowen, Silvia L. Cruz, Chapter Eighteen - Inhalants: Addiction and Toxic Effects in the Human, The Effects of Drug Abuse on the Human Nervous System, Academic Press, 2014; Pages 553-574, ISBN 9780124186798, https://doi.org/10.1016/B978-0-12-418679-8.00018-6.

2) Gigengack, R. "My body breaks. I take solution." Inhalant use in Delhi as pleasure seeking at a cost. International Journal of Drug Policy,2014; 25(4), 810-818. http://dx.doi.org/10.1016/j.drugpo.2014.06.003

3) Kumar, Suresh et al. "Inhalant abuse: A clinic-based study." Indian journal of psychiatry vol. 50,2 (2008): 117-20. doi:10.4103/0019-5545.42399.

4) Gaurav Vivek Bhatnagar, The dark truth about whiteners. The Hindu: 2012 Aug 8.

5) Radhika C Pillai, Whitener addiction on the rise among teens. Times of India: spotlight 2014 January 14.

6) Chandan Haygunde. Whitener high gives cops a headache. The New Indian Express: Archives 2009 Nov 6.

7) Ballard, M. B. Inhalant Abuse: A Call for Attention. Journal of Addictions & Offender Counseling, 1998;19: 28-32. doi:10.1002/j.2161-1874. 1998.tb00133.x

8) Praharaj, S. K., Verma, P., & Arora, M. Inhalant Abuse (Typewriter Correction Fluid) in Street Children. Journal of Addiction Medicine,2008; 2(4), 175–177.

9) NIDA. "Inhalants." National Institute on Drug Abuse, 16 Feb. 2017, [cited 2019 Apr 5] Available from https://www.drugabuse.gov/publications/drugfacts/inhalants.

10) Weir E. Inhalant use and addiction in Canada. CMAJ. 2001;164(3):397.

11) Dindwiddie, S. H. Abuse of inhalants: a review Addiction, 1994;89: 925-939. doi:10.1111/j.1360-0443. 1994.tb03348. x.

12) Charles W. Sharp and Fred Beauvais. Inhalant Abuse: A Volatile Research Agenda. National Institute of Drug Abuse, NIH Publication 1992; No. 93-3475.

13) Charles W. Sharp and Neil L. Rosenberg Inhalant Abuse: A Volatile Research Agenda. National Institute of Drug Abuse, NIH Publication 1992 No. 93-3475.

14) McGarvey E, Clavet G, Mason W, Waite D. Adolescent inhalant abuse: environments of use. Am J Drug Alcohol Abuse 1999; 25:731-41

15) Ford JB, Sutter ME, Owen KP, Alberston TE. Volatile substance misuse: an updated review of toxicity and treatment. Clinic Rev Allerg Immunol (2014) 46: 19. https://doi.org/10.1007/s12016-013-8371-1.

16) James Pointer. Typewriter Correction Fluid Inhalation: A New Substance of Abuse, Journal of Toxicology: Clinical Toxicology, 1982; 19:5, 493-499, DOI: 10.3109/15563658208992504.

17) A. K. Done, the toxic emergency: Sniffing, bagging, huffing, Emerg. Med., 9, 187-195 (1977).

18) Waraich BK, Chavan BS, Raj L. Inhalant abuse: a growing public health concern in India. Addiction. 2003 Aug;98(8):1169.

19) Seth, R., Kotwal, A., & Ganguky, K. K. Street and working children of Delhi, India, misusing toluene: An ethnographic exploration. Substance Use and Misuse,2005; 40(11), 1659– 1679 DOI: 10.1080/10826080500222792

20) Gupta SK, Bali S, Jiloha R C. Inhalant abuse: An overlooked problem. Indian J Psychiatry 2009; 51:160-1.

21) Ray, R. Inhalant use among street children in Delhi: A situation assessment (Reportno.SE/08/094199). New Delhi: National Drug Dependence Treatment Centre, All India Institute of Medical Sciences. Substance Use & Misuse, 2009;46:46–49, 2011, DOI: 10.3109/10826084.2011.580206

22) Ray R, et al. Developing a Network of Treatment Providers in Government, NGO and Private Sector. Developed Under the Ministry of Health, Government of India and WHO Collaborative Programme. Report Submitted to WHO (India); 2011

23) Dhawan A, Chopra A, Ambekar A, Ray R. Treatment Seeking Behavior of Inhalant Using Street Children: Are We Prepared to Meet Their Treatment Needs.

Indian J Psychol Med. 2015;37(3):282–287. doi:10.4103/0253-7176.162918.

24) Bass M. Sudden Sniffing Death. JAMA. 1970;212(12):2075–2079. doi:10.1001/jama.1970;03170250031004.

25) Mondal NK. Commercial Glue Sniffing and Child Health: Indian Street Children are at a Risk. J Biosafety Health Educ 1 2018; e108. doi:10.4172/jbhe.1000e108.

26) Sood M, Sood A. Glue sniffing intoxication. Curr Pediatr Res. 2009; 13:59–61

27) Jayanth, S., Hugar, B. S., Praveen, S., & Girish Chandra, Y. Glue sniffing. Medico-Legal Journal, 2017;85(1), 38–42. https://doi.org/10.1177/0025817216671106.

28) Mahal, A.S, Nair, M.C, Dependence On Petrol - A Clinical Study 1978/1/1 Indian Journal of Psychiatry volume: 20, issue-1, Page: 15-19.

29) Pahwa M, Baweja A, Gupta V, Jiloha RC. Petrol-inhalation dependence: a case report. Indian J Psychiatry. 1998;40(1):92–94.

30) Joshi and Vankar. Gasoline abuse in a 10-Year-Old child with mental Retardation: a case Report. Substance Abuse: Research and Treatment 2015:9 5–8 doi: 10.4137/SaRt.S20148.

31) Priyanka Gautam, M.S. Bhatia, Jaswinder Kaur, Rashmita Saha Dependence on Petroleum products DELHI PSYCHIATRY JOURNAL 2015;Vol. 18 No. 1.