Case Study

Toluene Abuse in children: A Case Report

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Abstract:
Toluene (methylbenzene) is becoming an easily available substance of abuse. More so because of the easy and unrestricted availability, busy schedule of the parents and peer pressure. We present here a case of a young boy who fell to peer pressure to consume the substance. This could be a tip of an iceberg of the underlying huge prevalence of the said substance.

Introduction
Toluene (methylbenzene, toluol, phenylmethane) is an aromatic hydrocarbon (C7 H8) which is commonly used as an industrial solvent for the manufacturing of gasoline, acrylic paint, varnish, paint thinner, adhesive, glue, rubber cement and shoe polish. It is a colourless, sweet, and pungent-smelling, volatile substance which produces psycho-active effects after inhalation of its fumes.1

Toluene can be abused by various modes such as inhalation of fumes, ingestion or transdermal absorption. Toluene abuse or "glue sniffing" has become widespread throughout the world. Slang names for administrating the drug include “huffing” (ie, soaking a sock or rag) and “bagging” (ie, spraying paint into a plastic bag and inhaling).

Sudden sniffing death syndrome is the most dramatic outcome of volatile agent inhalation. 2, 3, 4 Toluene exposure can lead to chronic damage to the heart, lungs, kidneys, liver, peripheral nerves and brain.5, 6
Case Report
Master X, 12 years old male child, student of sixth class was brought to Psychiatry outpatient department (OPD) by his parents with complaint of sniffing a glue based ointment since the last nine months. As reported by the parents, the patient was apparently alright till 9 months back, when he was sent by his parents to live with his maternal grandparents for further studies.

As reported by the patient he started consuming toluene in the form of rubber based adhesive about nine months back. The mode of abuse was through inhaling (sniffing) the compound. It is available as a 5 mg tube of rubber based adhesive, which is available over the counter. Patient was introduced to toluene by classmates who were already abusing the substance.

Patient along with his friend would procure the substance from a shop from their pocket money. He would tell his family members that he is going out to play in the evening. There he and his friends would put the substance in a plastic polythene bag and would blow into the bag. When it had ballooned they would take turns to inhale the air fumes by holding it tightly over mouth and nose. They would repeat this process for at least 4-5 minutes and would use 1-2 tubes of the adhesive. Initially for a few times the patient had felt nausea and had vomited. He also felt numbness in his head and felt dizzy. Patient was coaxed by his friends to use the substance again and again as it would relax him and make him happy. Patient continued abusing the substance thus on.

Over a period of time, the frequency of use increased from initially once per day to three to four times per day. Patient described that on an occasion when he went with his family members to attend a relatives marriage he was unable to procure the adhesive in the new village, this made him restless irritable and lethargic. Thereafter he stopped accompanying the family members wherein a situation he has to stay away from his place overnight.

On consuming the substance patient would feel light headed. He would feel pleasant and happy. Patient would also experience visual hallucinations in form of human shapes and animal images flashing in front of eyes. He would also see black colored spots in front of his eyes. Patient would occasionally have headache and restlessness. The use of substance leads to patient having decreased concentration in class leading to poor performance. The school grades of patient fell markedly. Patient would interact less in class and remain aloof. At home he would be alone and not talk much with family members. There was also a decrease in appetite of the patient which resulted in decrease in weight over the period of time.

Family members stumbled upon his addiction when they discovered empty tubes of adhesives in his clothes and school bag. Upon confronting the patient agreed upon sniffing the adhesive.

There was no past or family history suggestive of any psychiatric disorder or drug abuse. His developmental history was uneventful. He is elder of the two siblings and belongs to a middle socio-economic status.
On mental status examination (MSE) patient had thoughts of guilt and had crying spells on interviewing. His memory and orientation was intact. No disorder of perception and thought at the time of interview.

**Investigations:** Electrolytes with blood urea nitrogen and creatinine; Complete blood count; Electrocardiogram; Liver enzymes; Urinalysis; Creatine kinase; Chest radiograph, Electro Encephalography (EEG), CT scan head were within normal limits. The patient was of normal intelligence quotient (IQ).

**Provisional Diagnosis:** Toxic Effects of Benzene
[A proposed entity in the ICD – 10 CM (T52.2); 2013 ICD-10-CM Diagnosis Codes > Injury, poisoning and certain other consequences of external causes S00-T88> Toxic effects of substances chiefly non-medicinal as to source].

**Treatment:** Tablet Risperidone 0.5 mg BID; Tablet Naltrexone 50 mg ½ OD. Supportive and family psychotherapy sessions were undertaken. Patient started showing improvement after ten days of treatment. Currently he is maintaining abstinent after about six months of treatment.

**Discussion**
Toluene is used widely as a drug of abuse due to easy availability, accessibility and low cost. It is easily available over the counter and has no legal restrictions on the buying age of a person. Its abuse in children and adolescents is on the increase. Higher rate of toluene abuse by children is seen in lower socioeconomic strata and in troubled and broken families.  
Problems in family, school or poor performance in studies could further aggravate the chances of abuse in children and adolescents. Peer pressure and pressure of being accepted into a social group also plays an important part in children taking up drugs.

Long term abuse of the substance is associated with number of harmful and fatal adverse effects. Inhalant abuse can lead to cardiomyopathy, neurotoxicity, bone marrow depression and associated anemia and leucopenia, sudden sniffing death syndrome.

No antidote exists for toluene toxicity. Management should involve the family members and school supporting staff actively along with the treating physician. Supportive psychotherapy, health education, enhancement of the coping skills should be the need of the hour.

**References:**