Supervasmol33 Keshkala Poisoning: Role of ENT Surgeon

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Abstract Poisoning is the one of the common mode of suicide in India. Certain types of poisoning are common in particular region. Similarly, super vasmol poisoning is one of the commonest modes of suicidal attempt in our region. Hence, we took this matter with special interest and wants to emphasize the role of ENT Surgeon in such poisoning. This study informs the importance of amount of ingestion and early hospitalization. This study also deals with systemic complications, and its remedial measures to overcome the complications.

Keywords Poisoning · Suicide · Super vasmol · Systemic complications · Remedial measures

Materials and Methods

It is a prospective study addressing 73 patients of super-vasmol poisoning over the period of 2 years in our hospital. This study reveals the importance of early surgical intervention in the form of life saving tracheostomy in a patient of super vasmol poisoning with severe stridor. This study also included no of deaths may be in the form of brought dead or death due to complications of poisoning. This study emphasizes the importance of time of hospitalization after consuming poison. The study also deals with the no of patients who have been referred to higher centers for ventilator support in the form of further management after tracheostomy.

Observation

This prospective study included 73 patients of super vasmol poisoning in our institution, on an average 2–3 cases per month over a period 2 years. According to our study, females of below 30 years are the major victims of super vasmol poisoning along with their innocent children 56/73 (76%) in contrast to males being less no. of cases of poisoning 17/73 (23%) similarly, in pediatric age group, female kids patients are also more vulnerable to this poisoning 8/9 (88%) on contrary to male kids being 1/9 (11%).

According to age group, majority of patients of super vasmol poisoning are belongs to second decade 14/29 (48%). The 6th decade age group patients are being less no.of patients who are affected by this poisoning in this study.

The time of hospitalization varies from 3 to 24 h after consuming poison. The average time of hospitalization after consuming was 5 h, indicating that majority of people got admitted to the hospital after 5 h of consuming poison.

The common mode of presentation of the patient to hospital was severe difficulty in taking breathing/stridor (90%) and some patients were asymptomatic (3%).

The majority of patients who got admitted to the hospital were treated by surgical intervention in the form of emergency tracheostomy than by conservative treatment with systemic steroids, may indicating that might have been over treated by surgical intervention, suspecting impending stridor in immediate hospitalized period. The 15 (20%) patients who developed renal complications in the post operate period after emergency tracheostomy.

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Age Group

Infancy	1st decade	2nd decade	3rd decade	4th decade	5th decade	6th decade
6	23	31	8	3	2	0

Sex Group

Male	Female
17	56

Amount of Poison Consumed

1 gulp	2 gulps	½ bottle	Full bottle	Mixed with other drinks
17	6	36	9	5

No. of patient brought dead	6
No. of patients presented with major symptoms like stridor and respiratory distress	57
No. of patients underwent tracheostomy	48
No. of patients referred to higher center for further management	13
No. of patients died after hospitalization	5
Due to overdose of poison intake	3
Due to surgical complications	Nil
Due to systemic complications of poison	2

Results

All patients who have undergone tracheotomy were rescued from succumb to death due to acute respiratory obstruction. Some of these patients (13 in no.) were sent to higher center for assisted ventilation and dialysis.

Types of Mucosal Injury of Oral Cavity, Oro Pharynx and Larynx

We could observe 2 types of injuries, mainly,

- (1) Acute catarrhal: majority of injuries are included in this category which accounts for 97%. It was characterized by acute inflammation of mucosa with severe congestion associated with gross sub mucosal oedema, indicates that lesions are due to angioneurotic edema rather than poison itself.
- (2) Ulcerative: rarely observed, it accounts for 3%. Ulcers were very small and associated with moderate degree of congestion.

Long Term Sequele of these Lesions

We have followed up few patients for quiet long term but we haven't noticed any complications or sequel due to this poison. We didn't see any stenosis or stricture of the upper aero digestive tract as commonly observed in case of corrosive poisoning. It indicates that prognosis of patients of this poison is fair enough if you can take care of initial period after consumption of poison, may be in the form of tracheotomy for acute airway obstruction, ventilator support for respiratory failure and dialysis for severe rhabdomyolysis and renal shutdown.

Local Application of Medication to Prevent Complications

We haven't tried any medication such as mitomycin C, steroidal creams in the form of local application to prevent stenosis or stricture which are commonly seen due to

corrosive or alkali burns. But we have given inj. Methyl prednisolone added in 5% dextrose drip and repeated for initial 24 h, later on switched over to either hydrocortisone or dexamethasone for next 72 h or till the patient is get discharged.

Autopsy Findings

Similar types of injuries were observed in the mucosa of various parts of throat. In the stomach, apart from acute inflammation, it was also observed that severe congestion with minute non bleed ulcerative hemorrhagic spots. The kidneys had shown deep congestion indicating massive rhabdomyolysis.

Provoking Factors to Consume Poison

In females: ch. Illness, Lack of security, premarital conception

In males: Poverty, Quarrel with in the family members

In children: Lack of male partner support in the family

Discussion

The medico-legal importance of super vasmol 33 Kesh kala poisoning is usually an accidental or suicidal. Majority of times, it is suicidal, but it can be accidental where the patient gets exposed for prolonged periods result in chronic toxic effects of the various ingredients of hair dye (SV 33 Kesh kala). Very rarely, it may be homicidal. The exact concentration that causes toxicity is unknown. But 3gms is sufficient to cause systemic complications. Fatal dose is 7–10 gm. Fatal period is within 24 h of consumption. It has high mortality rate (47%). The large amounts of this dye ingestion produces a wide a range of clinical manifestations and systemic complications such as Pain in the throat, Cough, dyspnoea, oedema of tongue, pharynx and neck (angio neurotic oedema), vomiting, gastritis, bronchial spasm, chocolate brown colored urine due to myoglobi-nuria, metabolic acidosis, hypo volumia due to hemolysis, rhabdo myolysis etc. Deposition of myoglobinuria casts within the renal tubule causes renal failure, cardiac arrhythmias like Ventricular fibrillation may also be seen.

Usually, high doses of this dye ingestion can cause

Cervico facial: laryngeal oedema—most dominating presentation (72%)

Musculo skeletal: rhabdomyolysis (100%)

Renal

- Impaired renal function (80%)
 - Glomerular lesion (94%)

- Interstitial lesion (84%)
- Tubular lesion (74%)

Hepatic: raised liver transaminase enzymes (76%)

Fluid and electrolyte imbalance: hyperkalemia (75%), hypo volumia

Cardiac: ventricular arrhythmias, sudden cardiac death

Neuro: brain death, rare due to anoxia

Causes of death: may be due to respiratory obstruction, ARDS, renal failure, Arrhythmias

Diagnosis: the history of consumption, angio neurotic oedema of face and neck, hard protruding tongue, respiratory embarrassment and discolored urine are the diagnostic features

D/D: ludwig's angina

Management: routinely done by

- Endo tracheal intubation
- Emergency tracheostomy
- Anti histaminics
- Steroids
- Alkaline diuresis (isotonic saline, sodium bicarbonate, diuretics)
- Haemoperfusion/hemodialysis

Ingredients of SV33 Kesh Kala

Aqua, light liquid paraffin, *Para* phenylene diamine, propylene glycol, ceto stearyl alcohol, sodium lauryl sulphate liquid, EDTA, disodium resorcinol, herbal extracts, preservatives, almond proteins and perfumes

Para Phenylene Diamine (PPD)

It is an active ingredient of super vasmol 33 Kesh kala. Majority of times, it is responsible for wide range of complications of the sv33 Kesh kala. It is an aromatic amine, derived from *Para* Nitro Aniline compound. The chemical formula of compound is C₆H₈N₂. The IUPAC name is 1,4-diaminobenzene. The other name for this compound is 1,4-phenylenediamine. It is used in textile industry, photographic development, printing ink, temporary tattoos, and color enhancement. In India, one of the ingredients of popular hair dye (SV33 kesh kala). Physically, the *P*-phenylene diamine appears as a white to slightly red solid or crystals that darken on exposure to air. It is slightly soluble in water. The molecular weight is 108.15 g/mol. The lethal dose of PPD is 0.028 mg/l. It is mutagenic and also carcinogenic. It has been observed by review of English articles that there is an inconsistent association between personal hair dye use and non-Hodgkin's

lymphoma, multiple myeloma, acute leukemia, and bladder cancer. It has decreased the body weight of experimental animals on chronic exposure, as reported by US protection agency. There were no significant effects on the reproduction and development in experimental animals. It is absorbed from skin (intact) and rarely causes systemic effect. It is an allergen causing skin irritation. In fact, it was observed that allergen of the year in 2006 by the American Contact Dermatitis Society. The common routes of exposure to this chemical compound are (1) ingestion either by accidental/suicidal (2) inhalation (3) rarely, contacts either through eye or skin. The ingestion causes oedema of upper aero-digestive tract resulting in severe respiratory embarrassment and eventually central and peripheral cyanosis along with pain abdomen and vomiting. The sensitization dermatitis, developed by contact through skin may be a lifelong issue which may lead to active sensitization to products including black clothing, various inks, hair dye, dyed fur, dyed leather, and certain photographic products. The acute effects of this poison are severe dermatitis, eye irritation and tearing, asthma, gastritis, renal failure, vertigo, tremors, convulsions, and coma in humans. The chronic exposure in humans may result in eczematous contact dermatitis but in orally high-dosed rats have shown depressed body weights and elevated liver and kidney weights. The provisional Reference Dose of this substance is 0.19 mg/kg/d. This is an estimate of a daily oral exposure to the human population that is likely to be without appreciable risk of deleterious non cancer effects during a lifetime. It is not a direct estimator of risk but rather a reference point to gauge the potential effects. At exposures increasingly greater than the reference dose, the potential for adverse health effects increases. Lifetime exposure above the reference dose does not imply that an adverse health effect would necessarily occur. The *P*-phenylene diamine dihydrochloride, an active ingredient was not carcinogenic in a study of rats and mice exposed to the compound in the diet. Lung tumors in female rats and thyroid tumors in male rats occurred only in treated groups but at low incidences that were not statistically significant. In mice, tumors of the lungs, hematopoietic system, and liver occurred at a slightly higher level.

Propylene Glycol

The acute toxicity of this substance is very rare on oral route. In USA, it is used as a food additive as it is considered as safe substance in low doses. However, limited human experience indicates that inhalation of propylene glycol mists could be irritating to some individuals. Therefore inhalation exposure to mists of these materials should be avoided. The lethal dose is 1 gm/l. It is usually metabolized to pyruvic acid, acetic acid, lactic acid and

propionaldehyde, which are the normal end products of various metabolic pathways. Hence acute toxicity is very rare. It requires high doses of IV administration to produce deleterious effects in experimental animals. It may cause hypotension, brady cardia, ECG changes, cardiac arrhythmias, serum hyperosmolality and hemolysis in large doses. It may aggravate bronchial asthma, hay fever and eczema in sensitive children.

Cetostearyl Alcohol

It is a one kind of fatty alcohol, constituted by cetyl and stearyl alcohol. It is commonly used in hair conditioners and other hair products. It is also used as emulsion in either oil based or water based solutions. It produces emollient feel to skin. It rarely produces acute symptoms in low doses.

EDTA (Ethylene Diamine Tetra Acetic Acid)

It is globally accepted as persistent organic pollutant. The active ingredient of this substance is diketopiperazine which is a persistent, cumulative, organic environmental pollutant. Lethal dose is 2.0–2.2 g/kg body wt.

The various developmental and reproductive anomalies are seen on oral exposure of this chemical substance in experimental animals.

Conclusion

The super vasmol poisoning is common mode of suicidal attempt in our region. Death in super vasmol poisoning may be due to respiratory obstruction, due to (A) angio-neurotic oedema of larynx (B) may be due to oedema of

floor of the mouth and base of the tongue (C) may be due to systemic complications such as renal failure. Delay in hospitalization is directly proportional to the no. of deaths of the patients. Emergency tracheostomy is a life saving measure in severe stridor.

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