HAIR DYE (SUPER VASMAL – 33) POISONING – A CASE REPORT

DR. K. TAMILMANI¹, DR. R. SHANKAR²
1. Assistant Professor of Forensic Medicine, Thanjavur Medical college, Thanjavur, Tamilnadu.
2. Associate Professor, Department of Forensic Medicine, Kurnool Medical College, Kurnool, Andhra Pradesh.

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Abstract: Hair dye poisoning has been emerging one of the important cause of intentional self harm in the developing world, which is vastly available in the domestic market as Hair Dye[pic.1]. It has potent chemical substance like Paraphenylene diamine (PPD)[pic.2&3], Propylene glycol, resorcinol and other chemical which can cause sensitization/ rash , Angioneurotic edema, severe metabolic Acidosis Rhabdomyolysis & Acute renal failure

Keywords: Hair dye, Angioneurotic edema, Paraphenylene Diamine, Acute renal failure
INTRODUCTION

More than one lakh lives lost every year due to suicide in India. The suicide rate in India is 10.3% in the last three decades the suicide rate has increased by 43%. In India pesticides poisoning is one of the leading causes of death and which preventable tragedy. Recently hair dye poisoning is emerging as an important etiological factor. This reveals the Forensic importance of hair dye poisoning.

CASE REPORT:

A 21yr old Female came with the casualty with history of alleged ingestion of hair dye (super vasmol 33). She preserved with conscious state, difficult to breathing and complained of throat pain.

There was no addiction of any substances & no other co morbid condition. On general examination patient was conscious, oriented, a febrile BP:120/70 mm hg, PR:90/min, RR:16/min along with absence of pallor, ictirus, edema, clubbing, cardio vascular system, heart sounds were heard, respiratory system bilateral air entry present, abdomen soft after 12hrs she developed difficult to breathing then emergency Tracheostomy was done. Also noted coloured urine and tachycardia then she has been treated with steroids, diuretics and antibiotics, soda bicarbonate in spite of medial efforts she died.

AUTOPSY FINDINGS:

5]. Small intestine contains 30ml of dark colour fluid with no specific smell and mucosa is congested, Bladder contains 10ml of urine. Uterus is normal and is empty.

**Pic. 3 & 4:** showing laryngeal edema.

**Pic. 5:** Gastric mucosal congestion & hemorrhages.

**Viscera report:**

Reveals presence of PARAPHENYLENE DIAMINE.

**DISCUSSION:**

Hair dyes were used by Egyptians as early as 5000yrs B.C. Major Categories of colorings agent.

1) Temporary (Acid dyes). (Water soluble dyes with stored for one time shampooing).

2) Semi permanent (direct dyes).

3) Gradual colorants (Anti oxidant and Metallic dyes).

4) Natural dyes (Henna).

5) Demi permanent.
6) Permanent (Oxidation dyes) (Progressive hair dyes).

The performed dyes is 2 – nitro – P – Phenyl Diamine ( R’=CH2 CH2OH R2=R3=R4) and the intermediate form is P – Phenyl Diamine the final chemical component is Para Phenylene Diamine (PPD) which is oxidation product of BRANDROWSKIS base. The hair dye (Super vasmol – 33) contain Para Phenylene Diamine, propylene glycol, resorcinol, M- Aminophenol, alpha napthol, 5 amino ‘o’ cresol, 2 Hydroxyl ethylamine phenol etc. The Para Phenylene Diamine is allergic [Pic. 8 & 9], mutagenic, lightly toxic characteristic features severe angioneurotic edema, rhabdomyolysis release of calcium , iron from smooth endoplasmic reticulation followed by cutaneous contraction, irreversible changes in muscle structure , Hypovolemia due to direct effort of PPD or its metabolites on the Kidney. Respiratory failure due to secondary to inflammatory edema of cricopharynx and larynx, acute renal failure due to direct effect on kidneys leading to Acute Renal Tubular Necrosis [pic 6 & 7] and rhabdomyolysis changes. PPD directly act over the heart & leads myocarditis which produce arrhythmia and death.

![Pic. 6 & 7: Histo Pathology of Acute Renal Tubular Necrosis](image-url)

Propylene glycol:

It produce renal damage, hyper osmolarity, anion gap metabolic acidosis, CNS depression, arrhythmia, acute tubular necrosis and proximal renal tubular swelling. Resorcinol produce renal toxicity.

**CLINICAL FEATURES:**

Cervicofacial edema (79%), chocolate brown colored urine (74%), upper airway tract edema, (79%) oliguria (36.8%), muscular edema (26.3%), shock (26.3%), rhabdomyolysis, metabolic acidosis, acute renal failure (47.3%) and hyperkalemia (26.3%). In study of 374 case analysis, rhabdomyolysis and acute renal failure were main causes of mortality (21%).
Pic. 8 & 9: showing contact dermatitis with PPD dyes.

TREATMENT:

Hair dye poison is medical emergency, symptomatic treatment like gastric lavage, corticosteroids, endotracheal intubation, soda bicarbonate, haemodialysis and peritoneal dialysis are modality of treatment.

CONCLUSION:

Hair dye ingestion is uncommon cause of attempted suicide in Tirunelveli District and hair dye is available in several forms and commonest and cheap form is supervasmal 33 in 20gm packs which produce characteristic triad of strider due to upper airway edema, rhabdomyolysis and acute renal failure. Early clinical diagnosis and interventions is the cornerstone of management. In autopsy room to look for laryngeal edema, stomach contents and its colour, and mucosal and other organ congestion, chemical analysis report. Awareness about hair dye poisoning is helpful to reduce and prevent to attempt suicide.

Consumption of Super Vasmol 33 endangers the life of individual as it contains paraphenylene diamine. Hence it can be categorized in THE DRUGS AND COSMETIC RULES: 1945 under Schedule H Drugs.

CONFLICT OF INTEREST: NIL.

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4. Ellenborn’s Medical toxicology Diagnosis and treatment of human poisoning Matthew J. Ellenborn – 2nd edition (Page 1121 & 1811)


