

Study of Clinical Profile of Hair Dye Poisoning in A Tertiary Care Teaching HospitalS. Rajagopal¹, R. Pandichelvan²¹Associate Professor, Department of General Medicine, Government Theni Medical College Hospital, Theni²Associate Professor, Department of General Medicine, Government Medical College, Ramanathapuram

Received: 18-03-2023 / Revised: 21-04-2023 / Accepted: 26-05-2023

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Conflict of interest: Nil

Abstract

Introduction: Hair dye poisoning or ingestion was relatively rare in our setting until the last decade, but is now emerging as one of the most important cause of self-harm. PPD is an allergen which causes angioedema with labial, oral, lingual, pharyngeal and laryngeal edema which leads to acute airway compromise threatening the patient's life within a few hours of ingestion. This study was done as an attempt to study the clinical profile of the patients admitted with ingestional hair dye poisoning in Tirunelveli Medical College and Hospital.

Methodology: This study was done in cases admitted in our hospital with ingestional hair dye poisoning and done as a prospective cross sectional observation study. A total of 76 patients admitted with hair dye poisoning in the study period, 68 patients are included in the study. Previously designed proforma was used to collect the demographic and clinical details of the patient.

Results: In our study cervicofacial edema was present in about 47% of the patients. Elevated urea level was found in 37 out of 68 patients. Of 68 patients in our study only about 52% had elevated potassium value. In our study 28 out of 68 patients who had one of the above mentioned features were given forced alkaline diuresis. Out of 32 patients who had edema of the face, neck, tongue, pharynx etc., only 22 patients required tracheostomy. Hemodialysis was required in 5 out of 29 patients who had elevated renal parameters.

Conclusion: Hair dye poisoning is an emerging cause of self-harm among people in our region and is well poised to overtake the traditional modes of poisoning and can become one of the leading cause of suicides in our part of the world. Due to absence of antidote it is important to recognize this condition earlier and to start supportive therapy as early as possible to ensure a good outcome. In the primary care setup itself, attempts should be made to prevent future damage by means of instituting steroids and liberal fluid therapy before referring the patients to a higher centre. Thus the knowledge about this condition should be known by all primary care physicians in our country.

Keywords: Hair dye poisoning, renal failure, edema

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Introduction

Poisoning contributes to an important proportion of cases admitted to the medical wards in our hospital. It is one of the most preferred means of self-harm/suicide. Poisoning maybe either due to intentional, deliberate self-harm or by accident which may cause significant morbidity and mortality and also other social consequences.

Insecticides, especially the organophosphorus compounds contribute to the major proportion of self-harm or suicidal cases. Recently people have resorted to novel methods of attempt to self-harm in this changed socio cultural scenario. The overall suicide rate due to poisoning is about 31% in South India, of which majority were due to household agents, insecticides, drugs, chemicals, in the order

of frequency. Among the house hold articles that is used – chemicals (lavatory cleaners, hair dye) and drugs (prescribed for medical or surgical conditions) are noteworthy. The first case of toxicity due to para phenylene diamine (hair dye) was described in 1924 for as a loon owner. Hair dye poisoning is more common in Morocco and Arabian countries.

Hair dye poisoning or ingestion was relatively rare in our setting until the last decade, but is now emerging as one of the most important cause of self-harm. This is mainly due to the ease of availability of hair dye in virtually each and every household which gives the victim an easy chance to consume it [1]. Para phenylene diamine (PPD), is an important constituent of hair dyes and it is the main culprit causing the manifestations associated with hair dye ingestion. PPD is an allergen which causes

angioedema with labial, oral, lingual, pharyngeal and laryngeal edema which leads to acute airway compromise threatening the patient's life within a few hours of ingestion.[2]

It can also lead to rhabdomyolysis which causes muscle swelling, pain and tenderness and can also lead to acute kidney injury, pigment nephropathy. It may also lead to hepatitis, myocarditis and other metabolic abnormalities which proves to be life threatening for the patient. In the absence of a specific antidote and the easy availability of the component, there should be a high index of suspicion and early preventive measures which are required for a good outcome.

Case reports regarding the ill effects of PPD have been reported in many of the national and international journals[3]. As the incidence of paraphenylene diamine poisoning is increasing with serious outcomes, the study was done as an attempt to study the clinical profile of the patients admitted with ingestional hair dye poisoning in Tirunelveli Medical College and Hospital.

Materials and Methods

This study was done in cases admitted in our hospital with ingestional hair dye poisoning and done as a prospective cross sectional observation study for a period of January 2019 to June 2020. A total of 76 patients admitted with hair dye poisoning in the study period, 68 patients are included in the study excluding patients whose data could not be collected. Patients and attenders who do not opt for the study, patients with history of consumption of other substances/ poisons in addition to hair dye, patients with known cardiac disease, renal disease, hepatic disease were excluded.

Patients admitted in our IMCU were the study group. Previously designed proforma was used to collect the demographic and clinical details of the patient. Demographic details includes the age, gender, education and occupation of the patient. Clinical details includes dyspnea, Cervicofacial edema, limb pain and swelling, discolored urine, pulse, blood pressure and oxygen saturation. Laboratory data includes Blood total count, blood urea, creatinine, serum sodium, potassium, urine analysis for protein deposits, serum SGOT/SGPT, serum total CPK, CPKMB. Treatment details which were collected include airway management (tracheostomy or endo trachea intubation), ventilator support, the dose, duration and type of steroids used, alkaline diuresis used, dialysis details if done, use of vasopressors, anti-arrhythmics or cardioversion.

Cervicofacial edema, muscle pain and swelling and discolored urine were noted in the first 24 hours of

admission. Oliguria, palpitation, syncope and dyspnea are taken into account when present any time during the hospital stay. Blood urea, creatinine, serum electrolytes, serum CPK and urine analysis were taken at the time of admission, the second day and periodically one or two days after. The second and third day values are also taken into consideration for the study. Data analysis was done using SPSS software.

Results

A total of 68 patients consumed hair dye poison and were admitted in Intensive Care Unit, TVMCH within the study period, of which 49 were females and 19 were males. Age distribution data shows that maximum number of cases was seen in age group between 21 and 30. In our present study, the lowest age was 16 years and highest age was 52 years. Among our study population 19 were male and rest 49 were female population with a ratio of 2.57:1.

Of 68 patients in our study population, majority of patients are married (57%). Intentional self-harm or suicidal was the reason for 66 out of 68 patients who consumed hair dye poison in our study. Rest of them consumed accidentally.

About 32.4% of the patients who consumed poison came to Intensive Care Unit within 2 hours of poisoning and the remaining 67.6% were admitted between 2 to 6 hours of poisoning.

Clinical Features

In our study cervicofacial edema was present in about 47% of the patients. Majority of the patients were managed conservatively, i.e. drug therapy, only a small percentage required invasive procedure to maintain/secure the airway.

Of 68 patients who were admitted in ICU during our study period, about half of them experienced difficulty in breathing which adds to the severity of the poison consumed. Only few patients i.e. about 22% (n= 15) presented with cyanosis. Muscle pain, with or without swelling was present in 17.6% of the cases.

In our study 33.8% of the patients passed brown colored urine; Majority of them recovered with conservative management i.e., liberal parenteral fluids and alkaline diuresis within one or two days of admission.

Laboratory Parameters

Elevated urea level was found in 37 out of 68 patients who consumed hair dye during our study period. Serum creatinine of more than 1.5mg% was the cutoff for terming elevated creatinine value. Of 68 patients in our study about 43% had elevated creatinine value.

Coming to electrolytes, Of 68 patients in our study only about 52% had elevated potassium value. Similarly elevated value of SGOT/SGPT was found in about 35% of patients in our study group. Remainder of them had normal levels of SGOT/SGPT. Proteinuria was found in 23 patients, i.e., 33.8% of the patients; it ranged from to; it was done by dipstick method. Serum total CPK levels were elevated in 38% of the patients. It ranged from 435 U/L to 2100 U/L; values gradually decreased in majority of patients with establishment of normovolemic status with IV fluids and forced alkaline diuresis. Elevated CPKMB values were found only in 10 out of 68 patients in our study population.

Forced alkaline diuresis was done for patients who had myalgia, brown urine or elevated renal parameters. In our study 28 out of 68 patients who

had one of the above mentioned features were given forced alkaline diuresis. Out of 32 patients who had edema of the face, neck, tongue, pharynx etc., only 22 patients required tracheostomy.

Haemodialysis was required in 5 out of 29 patients who had elevated renal parameters. Other patients with elevated renal parameters were managed conservatively with high rate of fluid infusion along with forced alkaline diuresis to facilitate/accelerate the clearance of myoglobin.

Outcome

In our study 8 patients expired due to consumption of hair dye poison. Cervicofacial edema, dark colored urine, muscle pain and oliguria were present in all the eight expired cases.

Table1: Outcome

Mortality	Frequency	Percent
Recovered	60	88.2
Death <24hrs	4	5.9
Death >24hrs	4	5.9
Total	68	100.0

Discussion

Hair dye poisoning was first documented in 1924 and is emerging as one of the household agents commonly used for self-harm. This is because of the easy availability, ease of the mode of consumption and minimal cost that makes this compound an attractive one for suicidal attempt. Paraphenylene diamine is the main ingredient that is responsible for all the complications of hair dye poisoning which are angioedema, rhabdomyolysis, renal failure etc.,. As there is no specific antidote, early recognition of this condition and early institution of treatment is important to ensure a good outcome. In our study, about 97.1% of individuals consumed hair dye with intention of self-harm. Only a small percentage consumed it accidentally. This is consistent with the finding of PK Jain et al [3] (97.84%), in a study comprising large number of population in north India. The patients who consumed it accidentally, recovered with conservative management since they have stopped consuming on recognizing it as an unpalatable thing.

In regard to age group, 15 to 40 years age group comprised nearly 85% of the total patients which is consistent with the findings of Raghu Kondle et al [4] and PK Jain et al [3]. Females comprised majority of the patients about 72.1% in our study which was also consistent with various studies done in India. Cervicofacial edema was present in about half of the patients (47.1%) which is consistent with the finding of Srivatsa et al [5].

Difficulty in breathing was also present in about half of the patients (50%). Cyanosis was present in about half of the patients with Cervicofacial edema (22.1%). Urine discoloration was present in about 33.8% of our patients which is consistent with findings of PK Jain et al [3] (35%). Myalgia was present in about 17.6% in our study. Regarding laboratory findings, urea and creatinine were elevated in 54.4% and 42.6% of the patients respectively. Potassium was elevated in about 23.5% of the patients in our study which is comparable to PK Jain et al [3] and other studies [6-8] (28.2%). Proteinuria was present in about 33.8% of patients. Serum CPK was elevated in about 38.2% in our study which is consistent with PK Jain et al [3] (42%). SGOT/SGPT was elevated in 35.3% of patients in our study. Steroids were instituted for all patients on admission and were given for about 5 days for the patients with moderate to severe angioedema. About 68% of patients who had airway edema required tracheostomy. Of the patients who had elevated serum creatinine, only 5 (17%) of them needed dialysis. Mortality rate was more in females compared to that of males. Overall mortality rate was about 11.8% in our study and 22.48% in PK Jain et al [3] study. The mortality rate was lower among patients who received methyl prednisolone (14.02%) compared to hydrocortisone (27.7%) in PK Jain et al study [3]. In our study only hydrocortisone was used. Of the total 8 patients who expired, 7 of them had angioedema and required tracheostomy; 7 of them had elevated renal parameters out of which 3 of them required dialysis.

Conclusion

Hair dye poisoning is an emerging cause of self-harm among people in our region and is well poised to overtake the traditional modes of poisoning and can become one of the leading cause of suicides in our part of the world. Due to absence of antidote it is important to recognize this condition earlier and to start supportive therapy as early as possible to ensure a good outcome. The short term prognosis is determined by respiratory failure which is due to airway edema. On the other hand, the long term prognosis is related to muscular and renal damage. In the primary care setup itself, attempts should be made to prevent future damage by means of instituting steroids and liberal fluid therapy before referring the patients to a higher centre. Thus the knowledge about this condition should be known by all primary care physicians in our country.

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