

A Prospective Study of Incidence of ARF in Cases of Hair Dye Consumption.

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ABSTRACT

Background: Hair dye poisoning is the common cause of suicidal poisoning in Kadapa district of Andhra Pradesh. The clinical features are angioneurotic edema, stridor, rhabdomyolysis with chocolate colored urine, acute renal failure. Previous studies highlighted a high incidence of ARF and high mortality. **Methods:** 389 cases of suicidal poisoning due to Hair dye admitted in our hospital during the period January 2014 to December 2014 were included in our study. We made an effort to find out the incidence of ARF in our institution by observing the signs/symptoms and blood/urine and renal function tests. **Results:** Out of 389 patients, 268 patients consumed >50ml of toxin. Even though, high colored urine is seen in 161 patients (41.3%), number of patients who presented with raised blood urea, serum creatinine is 39(10%). Out of which 16 patients developed Acute Renal Failure and hence the incidence is 4%. The mortality due to ARF in our study is 0 %. Number patients who required tracheostomy is 33. Number of deaths due to respiratory failure is 10(0.02%). **Conclusion:** Hair Dye poisoning is a serious social issue and medical personnel should be aware of this poisoning so that early therapeutic intervention can avoid fatality.

Keywords: Acute renal failure, Hair Dye, Kidney.

INTRODUCTION

Hair dye that is available in this area is a popular emulsion-based permanent hair dye, containing mainly paraphenylenediamine [PPD] (4%), with liquid paraffin, acetostearyl alcohol sodium lauryl sulphate, EDTA disodium, resorcinol, propylene glycol, herbal extracts, and permitted preservatives and perfume.^[1] It has become the cause for endemic poisoning in the Kadapa district of Andhra Pradesh, India.^[2] The main ingredient of the dye is PPD.^[3] The effects of PPD when ingested are serious and include cervicofacial edema, mucosal injury, respiratory distress, rhabdomyolysis, acute renal failure and myocardial injury.^[4] The most common cause of death is acute renal failure due to rhabdomyolysis.^[5] The incidence of ARF in the previous studies range from 47.4%-70% with mortality rate varying between 0.03-60%.^[6] The purpose of our study is to show that there is decreased incidence of ARF in our institution due to effective fluid management.

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MATERIALS AND METHODS

389 cases of suicidal poisoning due to Hair dye admitted in our hospital during the period January 2014 to December 2014 were included in our study. Patients details are recorded in a study proforma which includes information about amount of poison consumed, and the time of arrival to the hospital.

Patients were enquired about related symptoms of hair dye poisoning like stridor, respiratory distress, muscle pain, episodes of vomiting, pain abdomen and brown color of the urine are used for clinical diagnosis [Figure 1].

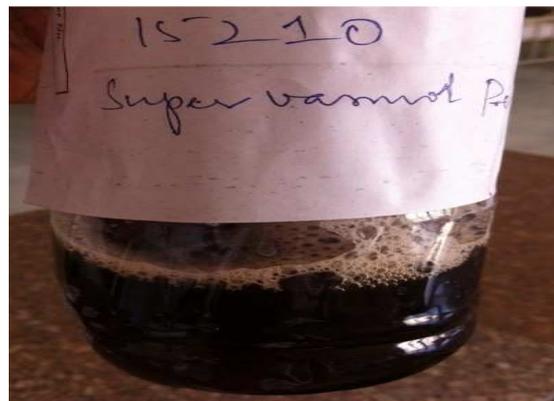


Figure 1: Showing High Colored Urine.

Foley's catheter was inserted to monitor urine output. Baseline blood investigations including renal function tests were carried out in all the patients within hours following admission. The quantity and color of urine, other signs of renal failure were recorded. All the patients were given supportive treatment and forced alkaline diuresis within hours of admission and the results were analysed.

RESULTS

Total number of Hair dye poisoning cases admitted in MICU during the study period of one year is 389. Out of them males were 97 and females were 292 with female preponderance of 75% [Figure 2].

GENDER RATIO

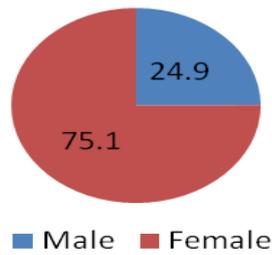


Figure 2: Showing gender ratio.

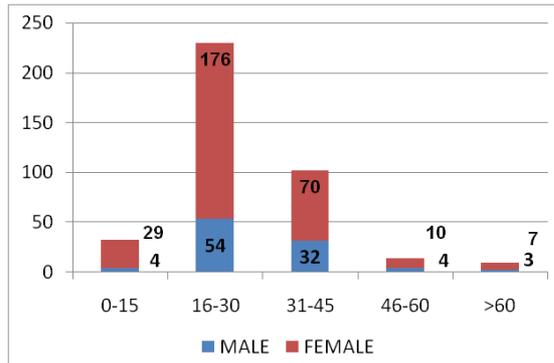


Figure 3: Common age group affected is 16-30 years.

Table 1: Mean size and weight of the kidneys.

Age Group (Years)	Male	Female	Total	Percentage
0-15	4	29	33	8.48
16-30	54	176	230	59.1
31-45	32	70	102	26.2
46-60	4	10	14	3.59
>60	3	7	10	2.57
	97	292	389	99.94

The clinical features of poisoning such as stridor is seen in 46 patients (11.8%), cervico facial edema in 29(7.4%), respiratory distress in 52(13.3%), myalgia in 93(23.9%) patients. Vomiting is the predominant symptom seen in 136 (34.9%) patients. The clinical features and outcome are shown in [Figure 4].

Table 2: Mean size and weight of the kidneys.

Volume consumed	Male	Female	Total	Percentage
<50 ml	28	93	121	31.1
>50ml	69	199	268	68.8

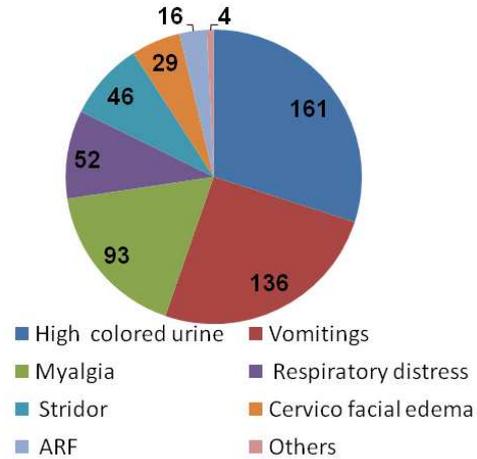


Figure 4: Showing symptoms of Hair dye poisoning.

Out of 389 patients, 268 patients consumed >50ml of toxin [Table-2].

Even though, high colored urine is seen in 161 patients (41.3%), number of patients who presented with raised blood urea, serum creatinine is 39(10%). Out of which 16 patients developed Acute Renal Failure and hence the incidence is 4%. Number of patients requiring dialysis is only 2. The mortality due to ARF in our study is 0%. Number patients who required tracheostomy is 33. Number of deaths due to respiratory failure is 10(0.02%) [Table 3].

Table 3: Illustrated the spectrum of Hair Dye Poisoning outcome.

	Male	Female	Total	Percentage	p Value
No of patients with high colored urine	63	98	161	41.3	0
No of patients with raised RFT	12	27	39	10	0.07
No of patients who developed ARF	7	9	16	4.11	0.37
No of patients who required dialysis	0	2	2	0.51	-
No of deaths due to ARF	0	0	0	0	-
No of deaths due to other causes (respiratory failure)	3	7	10	0.02	-

DISCUSSION

Hair dye is emerging as a fatal poison in this area. Rural, young poor women are the common subjects for whom this agent is inexpensive and easily available.^[7] Hair dyes could be perceived as “not bad enough to kill” by the vulnerable victims who may be taking it just with an intention of threatening the family.^[4] PPD is a key ingredient of hair dyes, used for colour enhancement. Only few, studies have been done on systemic PPD poisoning.^[8] However the combined effect of the individual compounds may be responsible for its significant morbidity and mortality. It is worth mentioning that the amount of PPD that can cause systemic poisoning is only three grams, while the lethal dose is 7-10 grams. The main toxicities of this compound include severe edema of the face and neck frequently requiring emergency tracheostomy. This is followed by Rhabdomyolysis and acute renal failure, culminating in death if not treated aggressively.^[9,10] Rhabdomyolysis is the main cause of acute renal failure and the morbidity and mortality are high once renal failure develops. Hypovolemia and the direct toxic effects of PPD or its metabolites on the kidneys also contribute.^[10] Kallel et al., studied 19 patients with PPD intoxication in Tunisia over a 6-year period.^[9,10] ARF was seen in 47.4% and hyperkalemia in 26.3%. In the series by Ram et al., the incidence of ARF was 70%.^[11] In a 11-year retrospective study of PPD poisoning reported to the Poison control centre of Morocco, 374 cases were analyzed. Rhabdomyolysis and acute renal failure were the main contributing factors for the 21% mortality. Sixty percent had ARF requiring dialysis whereas 30% had ARF which recovered with conservative measures.^[12] In our present study of 389 patients, the incidence of ARF is 4% which is very much less than the above mentioned studies, out of which 121 has taken around 40-50 ml of toxin. The characteristic chocolate brown color of the urine could be confirmative evidence of Vasmol poisoning in individual with the poisoning of PPD.^[13] In our study chocolate brown color urine is seen in 161 patients. Treatment is mainly supportive with effective fluid management. Alkaline diuresis using isotonic saline, sodium bicarbonate and diuretics is used in the management of Myoglobinuria.^[14] Dialysis is an effective supportive measure in case of oliguria.^[15] In our study, only 2 patients needed dialysis and mortality is zero %. Mortality is possibly reduced by early intervention with aggressive fluid therapy.

CONCLUSION

Hair Dye poisoning is a serious social issue to be considered in our area. Some of the countries considered PPD as a great hazard and banned its use

in hair dye. There is no specific antidote available, and trials of PPD removal using hemoperfusion and hemodialysis had variable results. Management of the patients depends on the amount of poison consumed and time lag between poison consumption and onset of treatment. However, early intervention with aggressive fluid therapy will decrease the incidence of ARF and the need for dialysis and decrease mortality. It is important that medical personnel should be aware of this poisoning so that early therapeutic intervention can avoid fatality.

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How to cite this article: Reddy KBY, Mohan A. A Prospective Study of Incidence of ARF in Cases of Hair Dye Consumption. Ann. Int. Med. Den. Res. 2016;2(1):333-35.

Source of Support: Nil, **Conflict of Interest:** None declared.