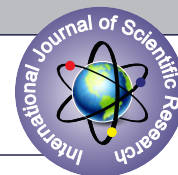


CLINICOEPIDEMIOLOGICAL PATTERN AND OUTCOME OF KEROSENE POISONING AMONGST CHILDREN ADMITTED IN A TERTIARY CARE MEDICAL COLLEGE HOSPITAL



Pediatrics

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ABSTRACT

Introduction: Accidental kerosene poisoning in pediatric age group is still a common problem in India. It causes considerable morbidity and occasional mortality. The objective of our study is to determine the pattern and severity of kerosene poisoning cases presenting to our emergency department and to discuss the various risk factors heralding adverse outcome.

Methodology: Data were collected over a period of three years from 1.3.2017-29.2.2020. A total 75 children were studied. A detailed history was taken using the proforma having special reference to age, sex, seasonal influence and thorough clinical examination was carried out including anthropometry, general and systemic details and data were compiled and subjected to statistical analysis with the help of spss software.

Results: Among 75 children with acute kerosene poisoning majority were in the toddler age group accounting to 93.33%. Males outnumbered the females with male female ratio 1.52:1. Seasonal preponderance was noted in the month of March to June followed by second peaking in the month of October and November. The casualties mostly took place in the own domestic premises. Potentially harmful habits of keeping kerosene in water storing bottles within the reach of the children were practiced by most of the householders. The most common clinical presentations were fever (93%), cough (90%) and vomiting (85%). Pneumonitis occurred in 31 patients and CNS involvement could be documented in three only. Mean Hospital stay was of three days. All patients improved except two died. Severe Protein energy Malnutrition, presence of complications and prolonged hospital stay were associated with adverse outcome. Extensive radiological findings in CXR 6 hours after the ingestion showed significant correlation with prolonged hospital stay.

KEYWORDS

Clinicoepidemiological Pattern, Outcome, Kerosene Poisoning, Children

INTRODUCTION

Kerosene poisoning is a common childhood accident but the outcome is rarely fatal. In most instances only small quantity is actually ingested because of its foul odour. Childhood poisoning results from complex interactions between the child, a hazardous substance and the environment¹. Ingestion of kerosene occurs in young children due to ready availability of the fuel stored inappropriately in various household containers. Toddlers are the common victims because of their tendency to eat whatever is accessible to them and sometimes by mistake for water. Kerosene mainly affects the respiratory and CNS. It is poorly absorbed after ingestion but absorption is rapid after inhalation or pulmonary aspiration². The toxic potential of kerosene is directly related to their physical properties of high volatility, low viscosity and low surface tension³. Signs and symptoms of respiratory involvement appear within 30 minutes after aspiration and progress during the first 1-2 weeks. The complications include hypoxia, pneumonitis, subcutaneous emphysema. Gastrointestinal affection results in pain, vomiting and diarrhoea. Rarely CNS manifestations may occur in the form of drowsiness and convulsions. Poor nutritional status, hypoxemia on arrival, ingestion of more than 5 ml and extensive radiological infiltrates in chest X-ray are forerunners of adversities.

The purpose of this study is to find out epidemiological and clinical spectrum of the children admitted with kerosene poisoning and various factors associated with poor outcome.

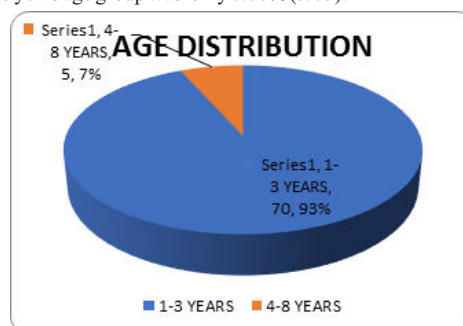
MATERIALS & METHODS:

It is an observational cross-sectional study carried out on all children in R.G. Kar Medical College Kolkata from May 2016 – April 2019. Detailed history with special reference to the age, sex, socioeconomic status and monthly incidence were noted. Clinical features with anthropometric measurements and radiological findings were compiled. Children were observed during their hospital stay and the complications if developed and the treatment given were recorded. Factors influencing prolonged hospital stay and the need for ventilation were studied with special interest. Categorical data were expressed as ratios and percentages. P value was calculated to find

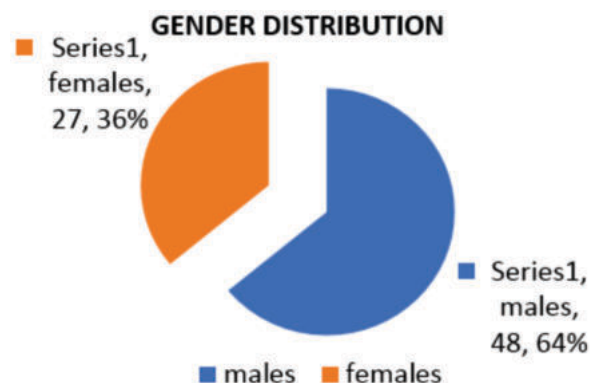
significant association between two factors. Significance of the test was determined by probability value of ≤ 0.05 .

RESULTS:

Among the total cases (n=75), 1-3 years age group was 93.3% (70/75), and 4-8 years age group was only 6.66% (5/75).



Males were more (48/75) as compared to female (27/75).



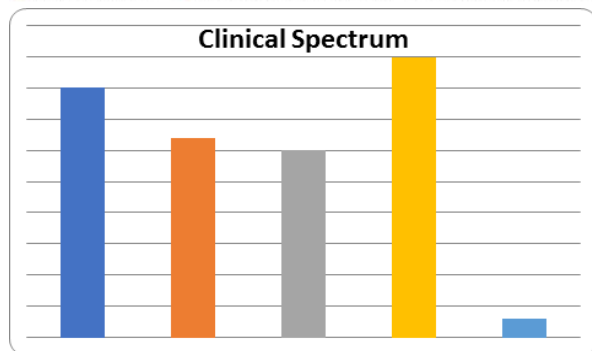
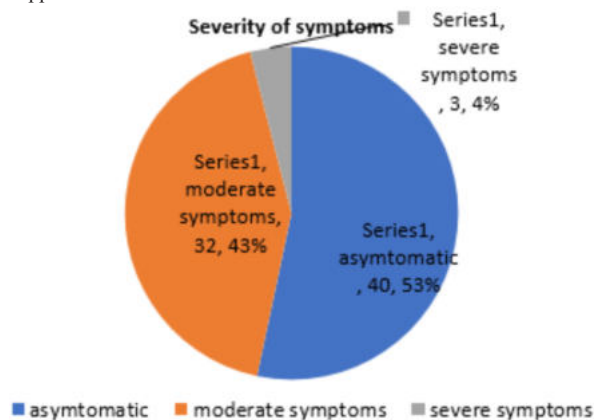
86% of the children came from low socioeconomic status according to Prasad's classification where kerosene served as major fuel for cooking.

We found in most of these cases kerosene was stored in soft drink bottles 63(84%). Only 8%(11) cases had stored them in appropriate containers. 4 children had sipped little amount of the fuel from the lamp (5%) itself. Most of the incidences occurred in the peak of summer months of April, May and June and again a second peak during the festival time of September and October.

Table 1 Socioeconomic Risk Factors For Kerosene Ingestion

<i>Socioeconomic status</i>	N=75
Middle class	10
Lower middle class	28
Lower class	37
<i>Storage</i>	
Soft drink bottle	63
Lamp	4
Kerosene oil container	8
<i>Months of the year</i>	
April- June	52
September-October	23

Out of 75 patients 40 were asymptomatic or showed minor respiratory system involvement. 32 were moderately sick while 3 needed intensive support.



Mortality was only 2.66%(2/75).

Pearson Chi square test level showed

1. Association with outcome and nutritional status

Outcome	PEM Grade i,ii	PEM Grade iii,iv
Expired=2	0	2
Discharged=73	51	22

df=1, p=0.059

No significant Association could be established.

2. Prolonged hospital stay and presence severe complications had significant association with fatal outcome

Outcome	Hospital Stay < 5 days	Hospital Stay > 5 days
Expired=2	0	2
Discharged=73	51	22

P=0.37

Outcome	Complications present	Complications absent
Expired=2	2	0
Discharged=73	10	63

P=0.000

3. Extensive radiological infiltrates were significantly associated with poor nutritional status

PEM Grade	Chest X Ray Single lobe involvement	Chest X Ray Extensive involvement
i, ii	48	3
iii, iv	15	9

P=0.000

DISCUSSION

Accidental kerosene poisoning ingestion remains a serious contributor to childhood poisoning in India. In this study we found poisoning predominantly affected the toddlers age group as the children of this age are more curious in nature aided by their newly acquired hand skills and mobility. Our results of 93.33% of toddler age group affection has also been found by various studies, one of which carried by Kulkarni V et al⁴. In our study 66.6% were boys which agree with most of the studies. This is mostly because boys are more curious and active than girls of the same age. However studies done by Gango et al⁵ in Singapore and Fazen et al⁶ reported equal incidence. Most of the children (86%) belonged to lower socioeconomic status where kerosene served as major fuel for cooking and where the children stayed in overcrowded area lacking parental care. This is similar to study of Mahdi AH⁷. In this study we have found that usage of empty bottles of soft drink as the container for kerosene within the reach of the children seeking water in the heat wave of summer had paramount contribution leading to these adversities. The same inference was drawn in a study S Anwar in Bangladesh⁶. Cough and fever were the most common presentation which showed similarity with Mahjood Al Naddawi study. In our study casualty was 2.6%. Mortality had significant correlation with prolonged hospital stay and presence of complications. Kerosene poisoning may lead to lipid pneumonia and subcutaneous emphysema, lipid pneumatoceles occasionally. Neurological complications consist of drowsiness, seizures and headache. We had 12 such children with complications. Patients with simultaneous respiratory failure and CNS involvement expired. In our study we have shown significant correlation with malnutrition and radiological involvement (Foley's Group III) was seen in 12 children out of which 9 were grossly malnourished. Increased lung involvement in children with poor nutritional status has not been shown earlier although we do not have any satisfactory explanation for this phenomenon. Further research is needed in this field.

CONCLUSION

To conclude dangers of kerosene oil poisoning and measures necessary to prevent its accidental poisoning ingestion should be actively and repeatedly stressed. Caregivers should be warned about the proper storage and usage of the necessary evil.

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