

Kerosene Poisoning in Childhood: A 5-Year Retrospective Study at a SBHGMC & Hospital Dhule

Nita Hatakar*, Ajay Kasumbiwal**, Diapli Narawade***

*Associate Professor **PG Student, Shri Bhausaheb Hire Government Medical College, Dhule-424001, Maharashtra, India.
**Associate Professor, Government Medical College, Nagpur - 440009, Maharashtra, India.

Abstract

Introduction: Kerosene Poisoning is an important & preventable cause of morbidity and mortality in the developing world. Kerosene aspiration may be associated with pulmonary complications and sometimes death. *Objectives:* To study the clinical profile of children with kerosene poisoning. *Material and Methods:* This is a 5 year retrospective study of children admitted with kerosene poisoning in SBHGMC & Hospital, Dhule between the years 2012 to 2016. Demographic and clinical data were recorded from the case records. *Result:* 88 children were admitted with kerosene poisoning. Male preponderance (60%) was noted. There was seasonal preponderance in the months of Feb to May. There was also an urban preponderance. The peak age group was from 1 to 5 years. Cough (56%), dyspnea (20%) and vomiting (42%) were the dominant symptoms. Radiologically Right lower lobe infiltration seen in 30% of children and bilateral lower lobe infiltration was seen in 15% of children. There was 1 death due to aspiration Pneumonia & encephalopathy. *Conclusion:* Kerosene poisoning happens largely due to ignorance of parents. Further research is needed in Kerosene encephalopathy to ascertain whether it is primarily due to direct toxic effect of the hydrocarbon or secondarily due to hypoxia of pneumonitis. Kerosene should be dispensed in child proof bottles with pictorial warnings to deter children.

Keywords: Kerosene; Aspiration; Children; Vomiting; Pneumonitis.

Introduction

Kerosene is a hydrocarbon which still remains as a major fuel used for cooking in rural India. The huge subsidy the Government provides makes it an economical alternative to LPG. Kerosene is usually stored in any household container and is easily accessible to children. Kerosene Poisoning is an important and preventable cause of morbidity and mortality in the developing world [1,2]. Kerosene has been identified as the most common cause of accidental poisoning in various studies around the world. [1-6] Ingestion of large quantity of kerosene is rare because of its foul smell and taste. Aspiration of kerosene usually occurs during swallowing and even 1ml of kerosene aspiration may be associated with pulmonary complications and sometimes death [7].

Low viscosity of kerosene enhances penetration into distal alveoli. Low surface tension facilitates spread over a large area of lung tissue. Experimental toxicological studies have shown that aspirated, and not the ingested, kerosene affects the respiratory system. Signs and symptoms of respiratory involvement appear within 30 minutes after aspiration and progress during the first 1-2 days and then subside in the following one to two weeks [8]. The complications of kerosene poisoning include hypoxia, pneumonitis, bacterial pneumonia, pneumatocele, pleural effusion, pneumothorax, subcutaneous emphysema and empyema [8-10]. The usual gastro-intestinal symptoms of kerosene poisoning are abdominal pain, vomiting and diarrhoea. Its Central Nervous System manifestations include drowsiness and convulsions. The aim of the study is to analyse the clinical profile of children

Corresponding Author: Ajay Kasumbiwal, Associate Professor, Department of Paediatrics, Government Medical College, Nagpur - 440009, Maharashtra, India.
E-mail: ajay_yvt@yahoo.com

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admitted with kerosene poisoning in the SBHGMC & Hospital, Dhule .

Material and Methods

This was a retrospective study. All the 88 children with Kerosene poisoning admitted in SBHGMC & Hospital, Dhule India from January 2012 to December

2016 formed the study group. From the case records data regarding demographic, clinical features and radiological findings of children with kerosene ingestion were collected.

Statistical Analysis

All the signs and symptoms, complications and outcome were tabulated and descriptive analysis was done.

Observation and Results

Table 1: Year wise distribution

Year	No. of Cases
2012	23
2013	26
2014	23
2015	09
2016	7
Total	88

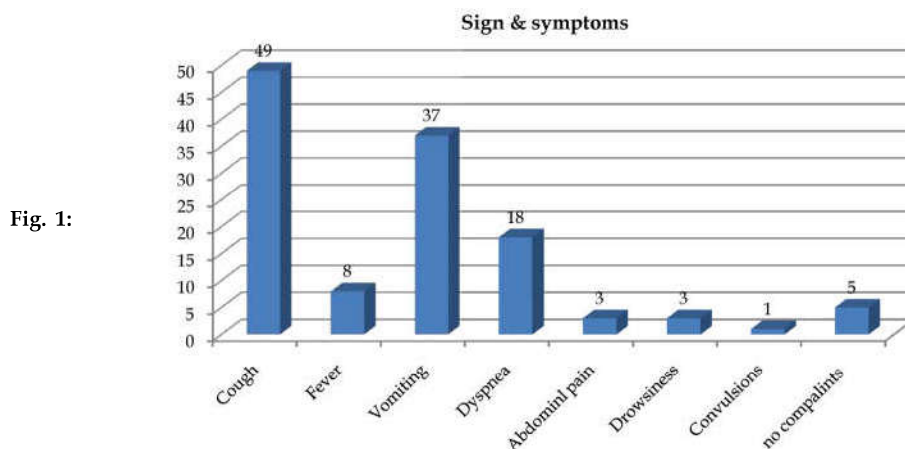
Table 2: Demographic Characteristics of children admitted with kerosene poisoning.

Characters	No of Patients	Percentage
Sex	Male	53
	Female	35
Age	1-5Year	79
	>5year	9
Residence	Urban	45
	Rural	43
Season	Feb-May	41
	June-Sept	27
	Oct- Jan	20

Table 3:

Radiological Finding	No of Patients	Percentage
Right lower lobe infiltration	12	13.7
Bilateral lower lobe infiltration	4	4.6
Bilateral perihilar infiltration	2	2.3
Normal	69	78.4
Total	87	100

*Due to poor general condition X-ray of one patient was not done



Results

During the study period there were 88 children admitted with kerosene poisoning. All the 88 children were hospitalized in Pediatric ward with duration of hospitalization ranging from 2-7 days. A male preponderance was observed with 60% of admitted children being males. With regard to age group, 1 to 5 years age group was most affected with about 90% affected children in the study group. About 8% of children were from urban area in the study group. The peak incidence of kerosene poisoning was in the months of Feb to May. In the symptom analysis of kerosene poisoning, the respiratory symptoms dominated the clinical picture. Cough, vomiting and dyspnea were the most common symptoms and signs observed. Fever developed in less than 10% of patients, the temperature ranging between 38-41°C, with duration from 1-5 days. About 4% of the children had drowsiness and one child had encephalopathy and convulsions. Abdominal pain was reported by 4% of affected children. About 6% patient have no complaint. During the study period one death was observed and it was due to encephalopathy and respiratory failure. 11% patient went seek discharge from hospital against medical advice about 10% absconded without informing. In the analysis of X-rays done of 64% of children affected with kerosene poisoning, about 30% showed right lower lobe infiltration and about 15% showed bilateral lower lobe infiltration.

Discussion

Kerosene poisoning remains as a serious cause of morbidity and occasional mortality in rural India. The peak age group affected was 1 to 3 years as in study by Rashid et al and Anwar et al [7,11]. This age corresponds to the Oral stage of Psycho sexual development of Freud where children put objects into their mouth as a reflex. The present study found an urban dominance in contrast to study by Anwar S et al and Mahdi AH et al [7, 12]. Contrast to study by L. Nouri and K. Al-Rahim, this study showed a seasonal preponderance in the months of Feb to May not in April to June [13]. Cough was present in 49 patients (55%), whereas it was found in (83.5%) in Nagi study, (96%) in Mahjoob Al-Naddawi study and (67%) in Shotar study [14-17]. Fever was present in 8 patients (10%), which was (73.8%) in Nagi study and (94 %) in Mahjoob Al-Naddawi study [14,17]. Vomiting after kerosene consumption was seen in 37 patients (42%) of this study. Nagi reported vomiting in (60.6%) and

Mahjoob Al-Naddawi reported vomiting in 90% of cases [14,17]. In the present study there was no instance of diarrhoea. This is in contrast to other studies which reported diarrhoea in about 4% of cases [14,17]. In the present study 3 children manifested drowsiness and 1 child had convulsions. It can be postulated that the encephalopathy is a result of direct toxic effect of hydrocarbon on the neural tissues rather than encephalopathy developing secondarily after hypoxia. Further research is needed to determine this.

Conclusion

Toddlers are more vulnerable to kerosene poisoning mainly because of ignorance on the part of parents to store kerosene properly. The respiratory system is the target organ to be damaged in kerosene poisoning. CNS complications though rare, do occur. Though mortality is rare, we report a single case of mortality due to kerosene poisoning. Further research is needed in cases of encephalopathy that occurs in kerosene poisoning to ascertain whether it is primarily due to direct toxic effect of the hydrocarbon or secondarily due to hypoxia of pneumonitis. Looking at the annual disease burden of kerosene poisoning in India, the Government needs to take concrete steps to prevent innocent children of our country to suffer and succumb to kerosene poisoning. Kerosene should be classified as hazardous chemical. It should be dispensed in containers having pictorial warnings with skull and bones to deter children.

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Conflict of Interest: None

References

1. Meyer S, McAdams AJ, Hug G. Unintentional household poisoning in children. *Klin Padiatr.* 2007;219:254-260.
2. Shiamo W, Bucurales JC, Balistreri WF. Paraffin (kerosene)* poisoning in under-five children: a problem of developing countries. *Int J Nurs Pract.* 2009;15:140-44.
3. Krug A, Ginsburg CM, Moses SW. The impact of child-resistant containers on the incidence of paraffin (kerosene) ingestion in children. *S Afr Med J.* 2010;84:730-34.
4. Sarker AK, Ghosh S, Barik K. A study of accidental poisoning (in children) in a rural medical college hospital of West Bengal. *Indian J Public Health.* 2005;34:159-62.

5. Thomas M, Zach MS, Atkinson SD. Profile of hospital admissions following acute poisoning-experiences from a major teaching hospital in south India. *Adverse Drug React Toxicol Rev.* 2000;19:313-17.
 6. Hamid MH. Acute poisoning in children. *J Coll Physicians Surg Pak.* 2005;15:805-8.
 7. Anwar S, Clinical Profile of Kerosene Poisoning in a Tertiary Level Hospital in Bangladesh. *Bangladesh J Child Health.* 2014;38:11-14.
 8. Thalhammer GH, Eber E, Zach MS. pneumonitis and pneumatoceles following accidental hydrocarbon aspiration in children. *Wien Klein Wochenschr.* 2005;117:150-153.
 9. Gupta P, Singh RP, Murali MV, Bhargava SK, Sharma P. Kerosene oil poisoning - a childhood menace. *Indian Pediatr.* 1992;29:979-984.
 10. Annobil SH, Ogunbiyi OA. Pulmonary Radiological changes in Kerosene poisoning in the Asir region of Saudi Arabia. *Ann Trop Pediatr.* 1991;11:391-395.
 11. Rashid MM, Hasan MA, Chowdhury FR. Childhood acute poisoning in a tertiary medical college hospital of Bangladesh. *Mym Med J.* 2007;16:12-14.
 12. Mahdi AH. Kerosene Poisoning in Children in Riyadh. *J of Tropical Pediatrics.* 2001;34:316-318.
 13. Nouri L, Al-Rahim K. Kerosene poisoning in children. *Postgraduate Medical Journal.* 1998;46:71-75.
 14. Nagi NA, Abdullah ZA. Kerosene poisoning in children in Iraq. *Postgraduate medical J.* 1995;71:419-422.
 15. Shotar A M: Kerosene poisoning in children. A 6-year prospective study at the Princess Rahmat Teaching Hospital. *Neuro-endocrinology letters.* 2005;26:835-838.
 16. Dr. K.S. Kumaravel et al. Kerosene Poisoning in Children. 2016 June;3(6). *ICV:* 50.43.
 17. Mahjoob Al-Naddawi, Kerosene Poisoning In Children. *The Iraqi Postgraduate Medical Journal.* 2009;8:23-27.
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