

# Kerosene Poisoning in Childhood: A 6-Year Retrospective Study at a Tertiary Referral Hospital Government Medical College and Hospital Nagpur

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## Abstract

Kerosene poisoning being an important and preventable cause of morbidity and mortality in the india. Kerosene aspiration may be associated with chemical interstitial pneumonitis and rarely death. *Material and Methods:* A 6 year retrospective study of Children admitted with kerosene poisoning at GMC & H Nagpur during the years 2011 to 2016. Demographic and clinical data were collected and analysed from the case records. 51 children were admitted with kerosene poisoning. Male preponderance (62%) was noted. There was also seasonal (October to December) and urban preponderance. The peak age group was from 1 to 3 years. Cough, vomiting, Drowsiness were the main symptoms. There was no death due to kerosene poisoning in this study. Kerosene poisoning happens largely due to ignorance of parents. Kerosene should be dispensed in child proof bottles with pictorial warnings to deter children.

**Keywords:** Kerosene; Aspiration; Children; Vomiting; Drowsiness.

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## Introduction

Kerosene, also known as paraffin, lamp oil and coal oil (an obsolete term), is a combustible hydrocarbon liquid which is derived from petroleum, widely used as a fuel in industry as well as households. World total kerosene consumption for all purposes is equivalent to about 1.2 million barrels per day [1].

In India kerosene is the main fuel used for cooking, especially by the poor, and kerosene stoves have replaced traditional wood-based cooking appliances. 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 [2].

Toxicity occurs if kerosene is inhaled while being ingested (aspiration), irritating to eyes and skin. Acute and chronic exposure to kerosene may result in CNS effects including irritability, restlessness, ataxia, drowsiness, convulsions, coma and death. The most

common health effect associated with chronic kerosene exposure is dermatitis. Kerosene is not particularly poisonous. However, if a child or adult accidentally swallows kerosene, medical advice should be obtained immediately as there is a small risk of short-term lung damage if vomiting occurs [3].

Kerosene Poisoning is an important and preventable cause of morbidity and mortality in the developing world [4-5].

Kerosene has been identified as the most common cause of accidental poisoning in various studies around the world [4-6].

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.<sup>[10]</sup>

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

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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 [11].

The complications of kerosene poisoning include hypoxia, pneumonitis, bacterial pneumonia, pneumatocele, pleural effusion, pneumothorax, subcutaneous emphysema and empyema [11-13].

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 admitted with kerosene poisoning at the GMC& H Nagpur India.

## Observation and Results

## Material and Methods

After taking clearance from ethical committee Retrospective study was done. All the 51 children with Kerosene poisoning admitted in Government medical college and hospital Nagpur from January 2011 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

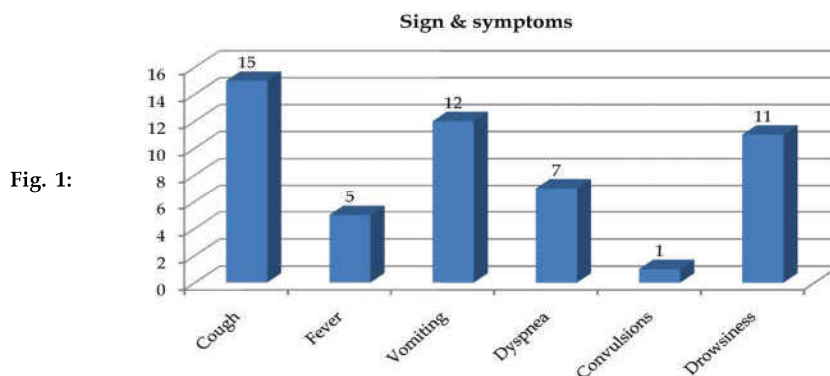
All the signs and symptoms, complications and outcome were tabulated and descriptive analysis was done.

Table 1: Year wise distribution

Year	No. of Cases
2011	6
2012	7
2013	9
2014	10
2015	16
2016	3
Total	51

Table 2: Demographic Characteristics of children admitted with kerosene poisoning

Characters	No of Patients	Percentage
Sex	Male	62.7%
	Female	37.2%
Age	<1 Year	7.8%
	1-3 Year	74.5%
	>3 year	17.7%
Residence	Urban	74.5%
	Rural	25.5%
Season	Jan-March	13.7%
	April-June	17.6%
	July-Sept	23.5%
	Oct-Dec	45.1%



**Table 3:**

Radiological Finding	No of Patients	Percentage
Right lower lobe infiltration	6	11
Bilateral lower lobe infiltrati	4	7
Bilateral perihilar infiltration	2	4
Normal	39	78
Total	51	100

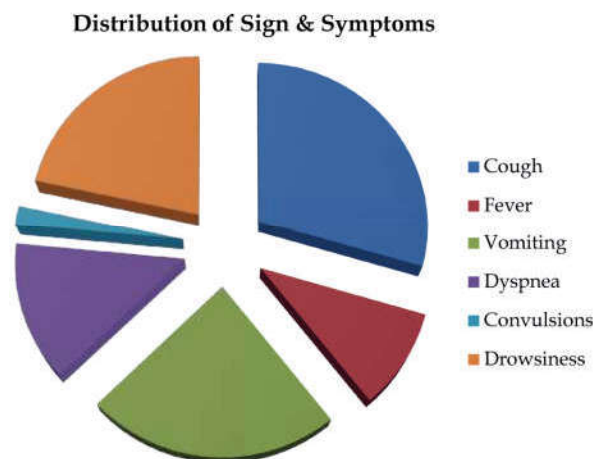


Fig. 2:

### Observation & Results

During the study period there were 51 children admitted with kerosene poisoning. These children were admitted in paediatric ward of GMC Nagpur with duration of hospitalization ranging from 2-7 days. A male preponderance was observed with 62.7% of admitted children being males. With regard to age group, 1 to 3 years age group was most affected with about 74.5% affected children in the study group. About 74.5% of children were from urban area in the study group. In this study the peak incidence of kerosene poisoning was observed in months of Oct-Dec [21]. In the symptom analysis of kerosene poisoning cough, vomiting and drowsiness were the most common symptoms observed. Fever developed in 9.8% of patients, the temperature ranging between 38-41°C, with duration from 1-5 days. About 21.6% of the children had drowsiness and one child had convulsions. No patient reported abdominal pain. During the study period no complication and no death was observed during this study.

Radiological findings were observed normal in 78%.

### 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 similar to study by Rashid et al and Anwar et al and Dr. K.S. Kumaravel et al [10-15]. 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 and Mahdi AH et al but similar to studies by Dr. K.S. Kumaravel et al [13-15]. In contrast to study by L. Nouri and K. Al-Rahim Dr. K.S. Kumaravel et al, this study showed a seasonal preponderance in the months of Oct-Dec [15-16]. Cough was present in 15 patients (29.5%), whereas it was found in (83.5%) in Nagi study, (96%) in Mahjoob Al Naddawi study and (67%) in Shoter study [17-20]. Fever was present in 5 patients (9.8%), which was (73.8%) in Nagi study and (94%) in Mahjoob Al-Naddawi study. Vomiting after kerosene consumption was seen in 12 patients (23.5%) of this study. Nagi reported vomiting in (60.6%) and Mahjoob Al-Naddawi reported vomiting in 90% of cases [17-20]. 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 [17-20]. Majeed et al reported close relationship between the pulmonary involvement and neurological complications [20]. In the present study 11 children manifested drowsiness and 1 child had convulsions. It can be postulated that it is a result of direct toxic effect of hydrocarbon on the neural tissues.

### Conclusion

Toddlers are more vulnerable to kerosene poisoning mainly because of ignorance on the part of parents to store kerosene properly. Kerosene is mostly stored in plastic bottles of soft drinks. There is need to educate parents to keep poisonous products in LOCKED cabinet and not to store kerosene in soft drink bottle. Also parents should know not to induce vomiting in kerosene poisoning unlike other poisoning. The respiratory system is the target organ to be damaged in kerosene poisoning. CNS complications though rare, do occur. The mortality is rare and there was no death in our study. 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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