

## Original Article

### Factors Contributing to Kerosene Oil Poisoning in Children

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#### Abstract

**Introduction:** Kerosene has been identified as the most common cause of accidental poisoning around the world with majority occurring to either lower or middle income countries. Kerosene poisoning is identified as the fourth leading cause of injury related mortality in children with highest risk for acute poisoning occurring in child under five years of age.

**Objectives:** To identify common factors responsible for exposure to kerosene oil poisoning, its presenting features and outcomes in children.

**Methods:** This was a descriptive study conducted in Department of Pediatrics and Emergency Department, Mayo Hospital / King Edward Medical University Lahore, Pakistan from March to September 2015.

Sixty children between the ages of 6 months to 10 years with history of kerosene oil ingestion/ poisoning were enrolled in the study. Information was obtained from guardians or parents.

**Results:** Sixty patients with history of kerosene poisoning were seen during the summer season. Age ranged from 6 months to 10 years. Most patients were from the ages 1 and 3 years and 75% were boys. Most children were from poor socioeconomic condition. The containers were soft drink bottles and plastic bottles; and kitchen and stairs were the common sites of storage. Clinical presentations were cough, vomiting and tachypnea. One child in study died after 8 hours secondary to respiratory complication.

**Conclusion:** Kerosene oil is a common health hazardous substance ingested accidentally by children. There is a need to create public awareness regarding kerosene oil storage and accessibility at home from the younger children.

**Key Words:** Children, Kerosene Oil, Poisoning, Preventive Measures.

#### Introduction

Kerosene Poisoning is an important and preventable cause of morbidity and mortality in the developing world.<sup>1,2</sup> Kerosene has been identified as the most common cause of accidental poisoning in various studies around the world.<sup>3</sup> More than one million children die following injuries every year worldwide<sup>4</sup> and poisoning is identified as the fourth leading cause of injury related mortality in children.<sup>5</sup> Children younger than five years have the highest risk for acute poisoning.<sup>6</sup> While the majority of them belong to

either lower or middle income countries,<sup>3</sup> developed countries have largely eliminated accidental kerosene ingestions.<sup>7</sup> Kerosene oil remains to be the commonest poisoning substance among children in many South Asian countries, including India<sup>8</sup>, Pakistan<sup>3</sup>, Nepal<sup>9</sup> and Bangladesh<sup>10</sup>; and African countries, including Nigeria<sup>11</sup>, Kenya<sup>12</sup>, and Zimbabwe<sup>13</sup>. A population based study that analyzed national health survey of Pakistan estimated 4.3% unintentional poisoning among children under five years of age.<sup>14</sup> In our study we aimed to identify common factors responsible for the exposure to kerosene oil poisoning, its presenting features and outcomes.

#### Methods:

Our study was conducted over period of six months between March to September 2015 in Department of Pediatrics and Emergency

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Department, Mayo Hospital / King Edward Medical University, which is 2060 bedded hospital, located in the heart of Lahore. Every day, 500-700 patients reach in Pediatric Emergency to get treatments and management. It is a government run hospital and biggest tertiary care hospital in Pakistan. Sixty children were registered with the history of kerosene oil poisoning/ ingestion. Guardians or parents were interviewed and a questionnaire was filled out for the following parameters: age, sex, type of containers, place of storage, time of ingestion, vomiting induced or not. Clinical observation included assessment of level of consciousness, vitals and signs of respiratory distress. Responses were, then, compiled and data obtained were analyzed statistically, using SPSS Version 13. All children between 6 months to 10 years who were suspected to be the cases of kerosene oil poisoning based on patient history were included. Children identified with no history of kerosene oil poisoning and the ages under 6 months and over 10 years were excluded.

Out of 60 patients, 35 were asymptomatic or showed minor respiratory symptoms for a brief period. Children were kept under observation for 6 to 7 hours. Chest X-rays were not routinely done. They were advised to return to the hospital if any symptoms developed. Symptomatic patients were hospitalized and laboratory investigation i.e. Complete Blood Count, ABGs and Chest X-ray were done. Antibiotics were administered to 11 patients with lung infiltrates and fever for more than 48-72 hours, with or without leucocytosis. Oxygen inhalation by mask and intravenous fluid were given as needed. When respiratory distress resolved and central nervous system status normalized, the children were, then, discharged from hospital.

**Results**

Total of 60 previously healthy children with history of kerosene oil ingestion were seen. Among them, there were 45 boys (75%) and 15 girls (25%).

The ages ranged from 1 to 3 years. Majority of patients who came to the hospital were from poor socioeconomic background (Table 1). The common presentation were: vomiting (43%),

cough and tachypnea (25%) grunting/ wheezing (16.6%) (Table 2). Most common site of storage was Kitchen (Table 3). Kerosene oil was commonly kept in soft drink bottles. A 3 year old boy died after 2 hours. The amount ingested could not be determined.

**Table 1: Distribution of children according to age and gender**

Age (Years)	Male (n= 45)	Female (n= 15)	Total (n= 60)	Percentage
< 1	06	1	07	11.6
1- 3	21	7	28	46.6
3-5	12	3	15	25.0
5- 10	06	04	10	16.6

**Table 2: Distribution of children according to symptoms**

Symptoms	No. of Children	Percentage
Drowsiness	03	6.6
Recession	06	10
Wheezing/ Grunting	10	16.6
Cough, Tachypnea	15	25
Vomiting	26	43.3

**Tables 3: Common sites of Kerosene Storage**

Site	No. of Patients	Percentage
Living room	5	8.3
Bathroom	10	16.6
Under stairs	15	25
Kitchen	30	58.3

**Tables 4: Number of children who ingested kerosene from various types of containers**

	No. of Children	Percentage
Toilet	3	5
Cup/ Glass	7	11.6
Plastic Bottles Etc.	15	25
Soft drink Bottles	35	58.3

### Discussion

Accidental childhood poisoning is an important paediatric emergency worldwide. The frequency and pattern of poisoning vary from place to place, depending on the environmental factors. In our study, it was most common among boys in the ages of 1- 3 years.<sup>15</sup> Other studies from the world show similar age and gender predominance.<sup>15</sup> In our study and others' studies, most children poisoning occurred during summer months.<sup>16,17</sup> The most of the children were asymptomatic at the time of presentation; majority of other children presented with vomiting, cough and tachypnea.<sup>18,19</sup> Majeed et al. reported also pulmonary complication and neurological manifestations.<sup>20</sup>

The common neurological symptoms in our study were restlessness and drowsiness. One child died secondary to respiratory and central nervous system involvement. The nature of the substance ingested reflects what is commonly found in the child's environment. In this study, kerosene was by far the most common agent responsible for accidental childhood poisoning. Kerosene is found in most homes, as it is the most common fuel used in cooking. It is a near colorless fluid and most times, is stored in similar container as water in homes, where potable water is also a scarce commodity.

In our study, many children from lower socio-economic group, in the summer months, had mistaken kerosene for cool refreshing drink, similar as in other studies.<sup>21-23</sup>

### Conclusion

Kerosene oil is a common health hazardous substance ingested accidentally by children. There is a need to create public awareness regarding kerosene oil storage and accessibility at home from the younger children. Multicenter study is needed to further assess the effectiveness of various educational programs regarding awareness in preventing accidental kerosene oil poisoning.

### Acknowledgement:

Authors acknowledge the patient and the parents or guardians of the children who participated in the research.

**Funding:** None.

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