



## AN OBSERVATIONAL STUDY OF DEMOGRAPHIC AND RADIOLOGICAL FEATURE OF ACCIDENTAL HYDROCARBON INGESTION

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### ABSTRACT

**Background:** Accidental ingestion of hydrocarbon continues to remain a common medical emergency among children in developing countries. The importance of this poisoning makes it imperative that parents should be aware about this poisoning.

**Objective:** The aim of this study is to know the various demographic and radiological manifestations of accidental hydrocarbon ingestion.

**Methods:** This prospective observational study was carried out in the children admitted in pediatric unit of our hospital with a total of 50 cases who has a history of accidental hydrocarbon ingestion.

**Results:** This study includes a total of 50 cases out of these 90% (45cases) are between 1-3 years. 60% (30 cases) male and 40% (20 cases) female. 88% (44 cases) ingested hydrocarbon. 56% (28 cases) ingested hydrocarbon from soft drink bottle. 42% (21 cases) consumed hydrocarbon of unknown quantity. 4% (2 cases) undergone native treatment before reaching the hospital. 34% of cases received in hospital within one hour of ingestion. Out of 50cases 48% (24cases) developed chemical pneumonitis.

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### INTRODUCTION

Acute poisoning is identified as the fourth leading cause of injury related mortality in children. Children less than 6years have the highest risk for acute poisoning while the majority of them belong to either lower or middle income countries<sup>(1)</sup>. Hydrocarbon oil poisoning in children is a preventable cause of significant mortality and morbidity. In hydrocarbon Kerosene oil remains to be the commonest poisoning substance among children in India<sup>(2)</sup>, Pakistan<sup>(3)</sup>, Nepal<sup>(4)</sup>, and Bangladesh<sup>(5)</sup>. Low socioeconomic status, unsafe storage, and large family size are previously reported risk factors for hydrocarbon oil poisoning among children<sup>(3)</sup>. Kerosene oil is a liquid hydrocarbon and its toxicity depends on low viscosity and high volatility. Primarily it causes pulmonary complications including chemical pneumonitis. Aim of this study is to know the demographic and radiological feature of accidental hydrocarbon ingested children.

### MATERIALS AND METHOD

Data was collected from patients who were admitted in pediatric ward/ pediatric intensive care unit at our hospital. Totally 50 patients were included. Children of pediatric age group who had history of accidental hydrocarbon ingested had included into the study. Informed consent was obtained from the parents of the study population. Children of both sexes were included. Children more than 12 years of age and with co-morbid illness like tuberculosis, Bronchial asthma, congenital malformations of lungs were not included in the study. We obtained a detailed history and a thorough clinical examination was done. The demographic and radiological feature were analyzed and compared among the study population.

### RESULTS

In our study children aged 1-3 years (90%) are easy victim for accidental ingestion 60% (30cases) were male, 40% (20cases) were female, among hydrocarbon 88% (44

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cases) consumed kerosene, 56% (28 cases) consumed kerosene from soft drink bottle, 42% (21 cases) were not sure of the amount of hydrocarbon consumed, 34% (17 cases) reached casualty within one hour. In our study 48% (24cases) have radiological features of chemical pneumonitis, 26% (13cases) had bilateral perihilar infiltrationin, 14% (7cases) have bilateral lowerlobe infiltration,8% (4cases) have right lowerlobe infiltration, 52% (26cases) of them have normal chest x-ray.

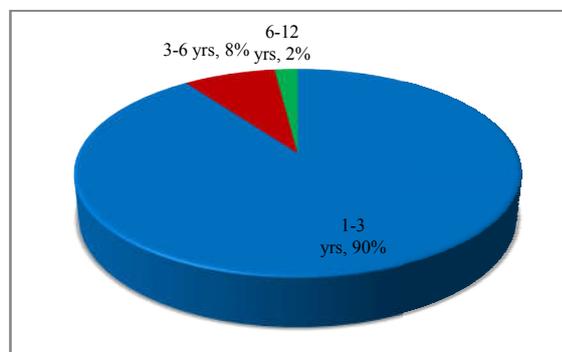


Fig 1 Age

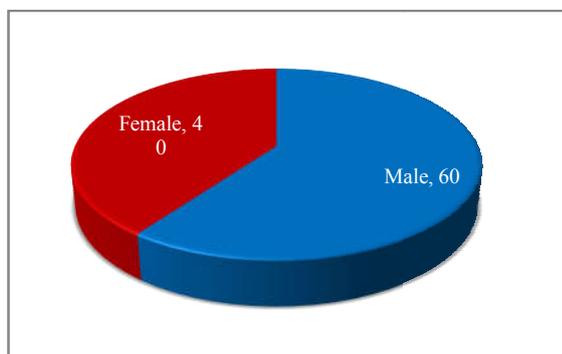


Fig 2 Sex

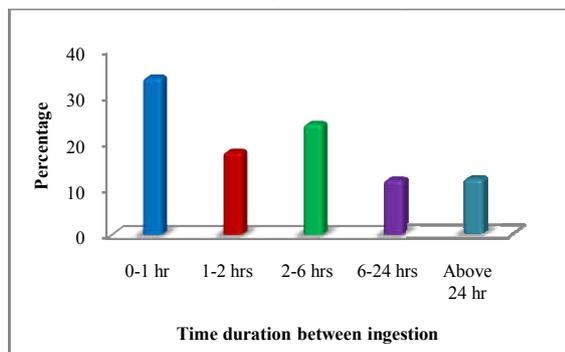


Fig 3 Time duration between ingestion and child reporting in hospital

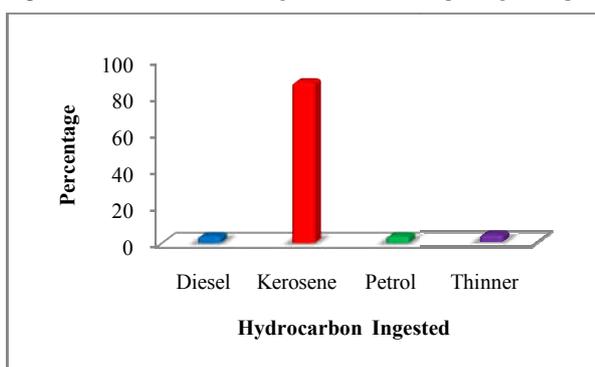


Fig 4 Hydrocarbon Ingested

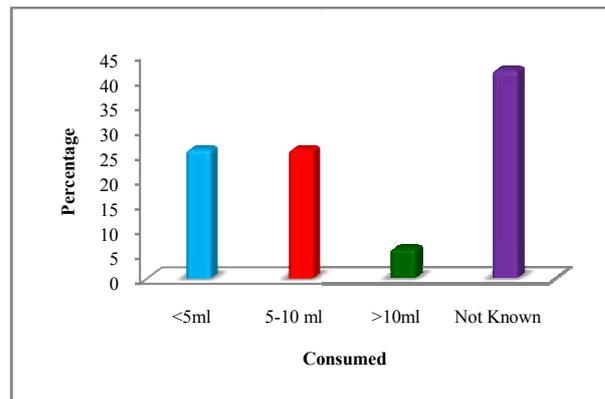


Fig 5 Quantity Consumed

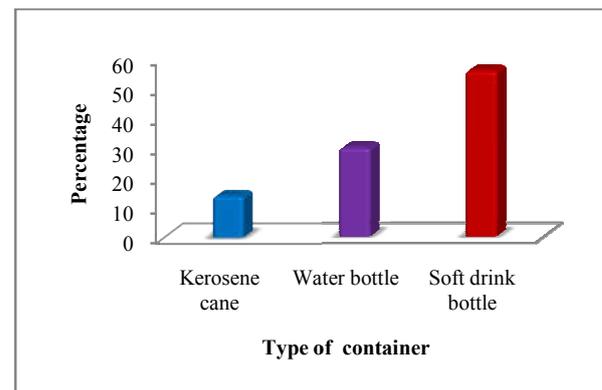


Fig 6 Type of container

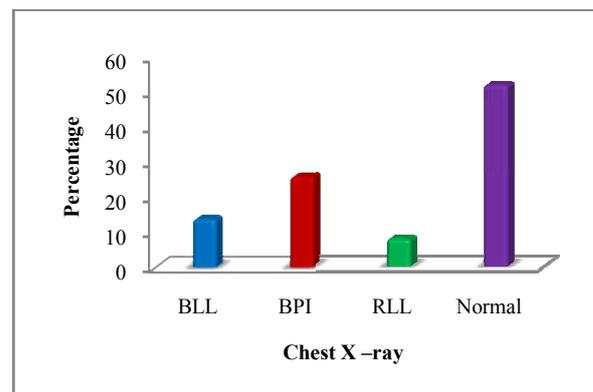


Fig 7 Chest X-ray

## DISCUSSION

Accidental hydrocarbon ingestion remains a serious contributor to childhood poisoning in developing countries with subsequent morbidity and mortality. In this study 60 % (30 cases) are male. This study is similar to Mahjoob Al- Naddawi *et al* (6), which showed 62% males. Similar results showed in Shotar *et al* (7), Nagi *et al*(8), Sachin S Hatti *et al*(9), study.

In our study age group more prone for kerosene (hydrocarbon) ingestion is 1-3years (90%). Lifshitz *et al*(10), showed 92% had showed similar results. This age range of children is probably due to their natural reflexes to put objects into mouth. Most common hydrocarbon ingested in our study is kerosene 88%, 42% of cases who ingested hydrocarbon doesn't know the quantity.

In our study 56% (28cases) consumed hydrocarbon from soft drink bottles, 30 % (15cases) consumed from water

bottles, study by AnwarS *et al* (5) showed 75% of cases consumed hydrocarbon from soft drink bottle. Usage of empty bottles of soft drink as container for hydrocarbon is related to most of the poisoning, because hydrocarbon is stored in soft drink bottle most of the children get attracted to it and consume it. This may be due to the childhood conception of soft drinks that misleads to those babies to drink hydrocarbon from the same type of bottles during thirst.

In our study 34 % (17 cases) reached casualty within one hour of ingestion of hydrocarbon. M.B. kavindachandimal Dayasiri *et al*<sup>(11)</sup>, showed 78.3% were brought to primary care unit within 45minutes of the poisoning events. Around 4% (2 cases) had undergone native treatment, the commonest measure was forceful ingestion of coconut milk. According to study done by M.B. Kavindachandimal Dayasiri *et al*<sup>(11)</sup>, 30% of cases undergone harmful first aid measure in which includes forceful ingestion of coconut milk.

In our study 48% (24 cases) had radiological features of chemical pneumonitis, 26% (13 cases) had bilateral perihilar infiltration, 14% (7 cases) had bilateral lower lobe infiltration, 8% (4cases) have right lower lobe infiltration, 52% (26 cases) of them have normal chest. In contrary, study by Mahjoob Al- Naddawi *et al*<sup>(6)</sup>, Nagi *et al*<sup>(8)</sup>, Nouri L and Al-Rahim *et al*<sup>(12)</sup>, Zaubaa *et al*(13), 32%, 45%, 40%, 40% respectively showed right lower lobe infiltration in chest x-ray.

## CONCLUSION

This observational study done on children who had an history of hydrocarbon ingestion, showed that most common hydrocarbon poisoning was kerosene (88%), common age group (1-3years), 56% of them consumed from soft drink bottle and 48% of them showed chemical pneumonitis on x-ray.

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