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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1119056>Available online at: <http://www.iajps.com>*Research Article***FACTORS LEADING TO ACUTE POISONINGS AND  
OUTCOME IN CHILDREN PRESENTING TO EMERGENCY  
ROOM AT TERTIARY CARE HOSPITAL****Dr. Sanam Khan<sup>1</sup>, Dr. Jai Parakash<sup>2</sup>, Dr Chetan Das<sup>3</sup>, Dr. Priya hotwani<sup>4</sup>, Dr. Suresh  
Kumar Rathi<sup>5</sup>**<sup>1</sup>MBBS, Email: shazia.mahar@hotmail.com<sup>2</sup>MBBS, DCH, FCPS, E-mail jaiparcash@gmail.com<sup>3</sup>MBBS, FCPS, Email: drchetandas@hotmail.com,<sup>4</sup>MBBS, Email: drchetandas@hotmail.com<sup>5</sup>MBBS, MSc Epidemiology, Email: skrathi1@yahoo.com**Abstract:**

Acute Poisoning in children is still an important public health problem and represents a frequent cause of admission in emergency rooms .

**Objective:** To determine the frequency of pattern and factors leading to acute poisonings and outcome in children presenting to emergency room at tertiary care hospital

**Method:** A descriptive study conducted in national institute of child health from September 10, 2015 to March 09, 2016. All children age 2 to 12 years with history of accidental poisoning and with duration of ingestion less than 6 hours were enrolled. Descriptive and bivariate analysis has been conducted through SPSS.

**Results:** Kerosene was the most factor observed in 69 (47.3%) patients, organophosphorus 37 (25.3%), alkali 28 (19.2%) and acid in 12 (8.2%) patients. Majority of the children admitted for > 24 hours due to acute poisoning.

**Conclusion:** The findings of the study showed kerosene as the most common pattern. Awareness generation and interventions are the need of hour.

**Keywords:** Kerosene oil, Poisoning, emergency room

**Corresponding Author:****Dr. Suresh Kumar Rathi,***MBBS, MSc Epidemiology**102, Aalekh, Near Yash Complex, Gotri Road, Vadodara, Gujarat**Email: [skrathi1@yahoo.com](mailto:skrathi1@yahoo.com)**Mobile No. +91-9825449480*

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**INTRODUCTION:**

Poisoning represents one of the most common medical emergencies encountered in young children, and accounts for a significant proportion of emergency room (ER) visits for the adolescent population [1]. A Study reported that, out of 70 consecutive patients of poisoning who visited the ER, Kerosene oil was the commonest agent accounting for 50% of all cases, followed by pharmaceutical products (14.3%) and chemicals (12.9%). Storage of Kerosene in empty bottles of beverages 35 (50%) and lack of proper storage of drugs 03 (4.3%) were the commonest risk factors identified. Most of the patients (84.3%) were discharged without any sequelae and overall mortality was 5.7% [2]. Of the 43 cases of accidental poisoning, pharmaceutical products (34.9%) were the leading cause of ingestion followed by kerosene oil (25.6%), organophosphorus (16.3%), alkali (9.3%) and acid (7%). Regarding the outcome of these cases, 29 were admitted, 7(16.28%) were discharged and 7 (16.28%) patients left against medical advice [3].

Pharmaceutical agents and kerosene oil poisoning were the leading cause constituting 29% each followed by opiate and organophosphorus constituting 17% and 15% respectively. Ninety-four percent of patients were discharged with almost complete recovery while six percent expired during hospital stay [4].

Study by Ram P, et al reported that kerosene (n = 23, 28.4%) and organophosphate compounds (n = 16, 19.8%) were the most common agents responsible for poisoning in children. The majority of the poisoning cases were reported to the hospital within 12 hour of the incident (n = 65, 83.3%). The mortality in Paediatric poisoning was observed to be 7.4%. The majority of the children (n = 68, 84.0%) recovered, while seven patients had left the hospital against medical advice – LAMA (8.6%) [5].

One hundred forty-three cases were evaluated, 71% of poisonings occurred in the age range of 1-5 years. Causes were accidental ingestion (77.8%), given by others (16%) and suicide attempts (6.2%). The most common ingested substances were petroleum products (16%), alkaline cleaners (12.6%), opiates (11.9%), tricyclic antidepressants (8.4%) and benzodiazepines (7.7%). About 2.8% of cases were multi-drug poisoning. Opiates were the most common agents which accounted for poisoning in below 6 months old [6]. In a study of poisoning following exposure to chemicals stored in mislabeled / unlabeled containers, children <5 years were 32%, 5-10 years 10%, and adolescents 5% [7].

**MATERIAL & METHODS:**

The Descriptive non probability consecutive sampling collected from emergency department of National institute of child health Karachi, from September 10, 2015 to March 09, 2016. Sample size calculated based on frequency of lack of proper storage of drugs 4.3%, confidence level 95%, bond on error 3.3%. The estimated sample size is 146 children of acute poisoning.

**Inclusion Criteria:** Children with history of accidental poisoning, duration of ingestion less than 6 hours, of either gender or Age 2 to 12 years.

**Exclusion Criteria:** Parents not willing to enroll their children for this study, children brought dead, unaccompanied by immediate witness and disputed history of ingestion.

**Data Analysis:** Data were analyzed on SPSS version 19. Age and duration of acute poisoning was presented as Mean  $\pm$  SD. Frequency and percentages was presented for pattern like kerosene oil, organophosphorus, alkali (bleach), acid (caustic soda), pharmacologic agent, factors leading to acute poisoning like storage of kerosene in empty bottles of beverages. Bivariate analysis also performed.

**OPERATIONAL DEFINITION**

**Acute poisoning:** History of ingestion of substances as mentioned in pattern within 24 hours and presenting with any 2 or more of the following features: 1) Headache: Visual analogue score  $\geq$ 7, 2) Weakness: unable to do daily activities like climbing stairs, 3) Dizziness: entire surrounding revolving, 4) Restlessness: unable to station at single place for more than 5 minutes and 5) Perspiration: nausea, diarrhea, loss of appetite, loss of weight, thirst, moodiness, soreness in joints, skin irritation, eye irritation, irritation of the nose and throat.

**Pattern:** it was measured in terms of following types of poisoning on history and identification of container: Kerosene, Organophosphorus, Alkali (bleach), Acid (caustic soda) or Pharmacologic agent (Tablets/capsules/syrup).

**Factors leading to acute poisoning:** Storage of Kerosene in empty bottles of beverages and lack of proper storage of drugs e.g., kept in draws without lock/on table.

**Outcome:** Admitted: for more than 24 hours, Discharge from ER: or LAMA.

**RESULTS:**

We enrolled 146 children of poisoning from ER during study period of 6 months. Stratification was conducted for the effect of age, gender, educational status, economic status, educational status of parents on the outcome. There were 97 (66.4%) males and 49 (33.6%) females. Majority (54.1%) of patients present less than 7 years of age. Duration of poisoning less than three hours were 97 (67%) as shown in table 1. Evaluation on the basis of financial ground, it was noted that 85 (58.2%) were with middle economic status, 47 (32.2%) with upper middle economic status and 14 (9.6%) with lower economic status (Table 2). The educational status of

parents revealed that 108 (74%) fathers and 93 (67.1%) mothers were illiterate (Table 3). In this study it was found that kerosene oil is major substance of poisoning patients i.e. 69 (47.3%), organophosphorus 37 (25.3%), alkali 28 (19.2%) and acid in 12 (8.2%) patients (Table 1). Storage of kerosene in empty bottles of beverage was observed in 42 (28.8%) patients whereas lack of proper storage of drugs was observed in 24 (16.4%) patients. Most of the patients 97 (66.4%) were admitted for more than 24 hours, 27 (18.5%) were discharged from ER and 22 (15.1%) were LAMA. (Table 4).

**Table 1: Comparison of Age, Gender and Duration with Pattern of Poisoning**

		Kerosene n=69	OP n=37	Alkali n=28	Acid n=12	Total n=146	P value
<b>Gender</b>	<b>Male</b>	50 (72.5)	8 (21.6)	27 (96.4)	12 (100)	97 (66.4)	
	<b>Female</b>	19 (27.5)	29 (78.4)	1 (3.6)	0 (0)	49 (33.6)	<0.001
<b>Age in years</b>	<b>≤7</b>	50 (72.5)	27 (73)	2 (7.1)	0 (0)	79 (54.1)	
	<b>&gt;7</b>	19 (27.5)	10 (27)	26 (92.9)	12 (100)	67 (45.9)	<0.001
<b>Duration of poison in hours</b>	<b>≤3</b>	44 (63.8)	28 (75.7)	18 (64.3)	7 (58.3)	97 (66.4)	
	<b>&gt;3</b>	25 (36.2)	9 (24.3)	10 (35.7)	5 (41.7)	49 (33.6)	0.562

**Table 2: Comparison of Economic Status with Pattern of Poisoning**

<b>Economic status</b>	<b>Pattern</b>				<b>Total</b>	<b>p-value</b>
	Kerosene	OP	Alkali	Acid		
<b>Lower</b>	14 (20.3)	0 (0)	0 (0)	0 (0)	14 (9.6)	0.003
<b>Middle</b>	39 (56.5)	23 (62.2)	15 (53.6)	8 (66.7)	85 (58.2)	
<b>Upper Middle</b>	16 (23.2)	14 (37.8)	13 (46.4)	4 (33.3)	47 (32.2)	
<b>Total</b>	69 (100)	37 (100)	28 (100)	12 (100)	146 (100)	

**Table 3: Comparison of educational status of Father and mother with pattern of Poisoning**

		Kerosene n=69	OP n=37	Alkali n=28	Acid n=12	Total n=146	p-value
<b>Education status of father</b>	<b>≥Intermediate</b>	7 (10.1)	0 (0)	0 (0)	0 (0)	7 (4.8)	0.003
	<b>≤Matric</b>	27 (39.1)	0 (0)	4 (14.3)	0 (0)	31 (21.2)	
	<b>Illiterate</b>	35 (50.7)	37 (100)	24 (85.7)	12 (100)	108 (74)	
<b>Education status of mother</b>	<b>≥Intermediate</b>	12 (17.4)	0 (0)	3 (10.7)	0 (0)	15 (10.3)	
	<b>≤Matric</b>	30 (43.5)	0 (0)	8 (28.6)	0 (0)	38 (26)	
	<b>Illiterate</b>	27 (39.1)	37 (100)	17 (60.7)	12 (100)	93 (63.7)	

**Table 4: Comparison of Age with outcome**

Age (in years)	Outcome			Total	p-value
	Admitted for more than 24 months	Discharge from ER	LAMA		
≤7	58 (73.4)	8 (10.1)	13 (16.5)	79 (100)	0.018
>7	39 (58.2)	19 (28.4)	9 (13.4)	67 (100)	
<b>Total</b>	97 (66.4)	27 (18.5)	22 (15.1)	146 (100)	

**DISCUSSION:**

This study was conducted among 146 children with acute poisoning presenting in ER of tertiary care hospital. In this study, kerosene was the major factor observed in 69 (47.3%) patients followed by organophosphorus 37 (25.3%), alkali 28 (19.2%) and acid in 12 (8.2%) patients. Storage in kerosene in empty bottles of beverage was observed in 42 (28.8%) patients whereas lack of proper storage of drugs was observed in 24 (16.4%) patients. Ingestion of an improperly stored liquid pesticide was the most common route of intoxication (76% of patients) [8]. Most of the patients 97 (66.4%) were admitted for >24 hours, 27 (18.5%) were discharged from ER and 22 (15.1%) were LAMA. Findings are in agreement with study reported that, out of 70 consecutive patients of poisoning who visited the ER, kerosene oil was the commonest agent accounting for 50% of all cases, followed by pharmaceutical products (14.3%) and chemicals (12.9%). Storage of kerosene in empty bottles of beverages 35 (50%) and lack of proper storage of drugs 03(4.3%) were the commonest risk factors identified. Most of the patients (84.3%) were discharged without any sequelae and overall mortality was 5.7% [2]. Of the 43 cases of accidental poisoning, pharmaceutical products (34.9%) were the leading cause of ingestion followed by kerosene oil (25.6%), organo phosphorous (16.3%), alkali (9.3%) and acid (7%). Regarding the outcome of these cases, 29 were admitted, 7 (16.28%) were discharged and 7 (16.28%) patients left against medical advice [3]. Common poisoning agents in low-income and middle income countries are fuels such kerosene [9] and in this study poisoning is common in middle income group. Pharmaceutical agents and kerosene oil poisoning were the leading cause constituting 29% each followed by opiate and organophosphorus constituting 17% and 15% respectively. Ninety four percent of patients were discharged with almost complete recovery while six percent expired during hospital stay [4]. Drugs were the most common agent causing the poisoning 71 (52.2%) followed by house cleaning products 38 (27.9%), food 10 (5.8%), pesticides 7 (5.14%) [10]. the most common

substances ingested were terbutaline (12.3%), benzodiazepines (12.0%) and dishwasher powder (9.3%). Almost half of the patients were admitted to the paediatric intensive care unit, but most only required supportive care. Specific antidotes were administered in 16 cases. Three patients suffered from aspiration pneumonia as a result of ingesting poison, but not a single child died during the study [11].

Ram et al reported that kerosene (n = 23, 28.4%) and organophosphate compounds (n = 16, 19.8%) were the most common agents responsible for poisoning in children. The majority of the poisoning cases were reported to the hospital within 12 hours of the incidence (n = 65, 83.3%). The mortality in paediatric poisoning was observed to be 7.4%. The majority of the children (n = 68, 84.0%) recovered, while seven patients had left the hospital against medical advice (8.6%).<sup>5</sup> In this study children less than 7 years were in majority 54.1% but study from Sri Lanka, Ninety-three percent of children (283/313) were less than five years [12]. One hundred forty-three cases were evaluated, 71% of poisonings occurred in the age range of 1-5 years. Causes were accidental ingestion (77.8%), given by others (16%) and suicide attempts (6.2%). The most common ingested substances were petroleum products (16%), alkaline cleaners (12.6%), opiates (11.9%), tricyclic antidepressants (8.4%) and benzodiazepines (7.7%). About 2.8% of cases were multi-drug poisoning.

A Sri Lankan multicenter study showed that male are predominant having kerosene oil poisoning (60.4%) consistent with our findings of kerosene oil poisoning among male (66.4%) [12]. Opiates were the most common agents which accounted for poisoning in below 6 months old [6]. In a study of poisoning following exposure to chemicals stored in mislabeled or unlabeled containers, children aged <5 years were 32%, 5-10 years 10%, and adolescents 5% [7].

**CONCLUSION:**

The findings of the study showed kerosene as the most common pattern while majority of the children admitted for >24 hours due to acute poisonings.

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