

ORIGINAL ARTICLE

An Autopsy Study of Cases of Death Due to PoisoningAISHA RASHEED¹, USMAN SHAHID BUTT², NOREEN FARID³, IJAZ AZIZ⁴, HAFIZA NAIMA ANWAR⁵, PERWAIZ AHMED MAKHDOOM⁶¹Assistant Professor Forensic Medicine and Toxicology Liaquat University of Medical and Health Sciences Jamshoro Sindh²Assistant Professor Forensic medicine & Toxicology Khawaja Muhammad Safdar Medical College, Sialkot³Assistant Professor Department of Forensic Medicine Foundation University Medical College, Islamabad⁴Assistant Professor Mekran Medical College Turbat, Baluchistan⁵Assistant Professor Shahida Islam Medical Complex, Lodhran⁶Professor and Chairman Department of Forensic Medicine, Jinnah Sindh Medical University KarachiCorrespondence to: Aisha Rasheed, Email: aeshakhalid@yahoo.com**ABSTRACT****Objective:** To describe the socio-demographic profile of deaths due to poisoning and to assess frequency of poisoning deaths, among the autopsies**Design of the Study:** Descriptive cross sectional study.**Study Settings:** The study was conducted at Department of Forensic Medicine and Toxicology Liaquat University of Medical and Health Sciences Jamshoro Sindh from January 2021 to December 2021.**Material and Methods:** The present study was carried out in the Department of Forensic Medicine from. During this period, 313 autopsies were conducted, out of which, majority of cases were poisoning deaths. Among them 100 cases of Poisoning deaths were selected for the study based on purposive sampling and Chemical Analysis Report.**Results of the Study:** The most common poisons encountered in this study were OP compound (55 - 50%) and Phosphide ions (33 - 30%). Congestion (24 – 21.81%) and pulmonary edema (19 – 17.27%) was the most common findings in the lungs in cases of OP compound poisoning; whereas, pulmonary hemorrhage (12– 10.90%) and congestion (11– 10%) was the most common findings in the lungs in cases of Phosphide ion poisoning. Necrosis (16– 14.54%) and sinusoidal dilatation (14– 12.72%) was the most common findings in the liver in cases of OP compound poisoning; whereas, necrosis (21– 19.09%) and fatty change (09 – 8.18%) were the most common findings in the liver in cases of Phosphide ion poisoning.**Conclusion:** The most common form of poison taken by this research cases is organophosphorus pesticides. Males are more likely to be poisoned than females. In both rural and urban communities, married people outnumbered single people. Based on the information provided by the police and families of the deceased, the suspected type of poison in the majority of the victims remained unclear prior to autopsy.**Keywords:** Poisoning, Autopsies, Forensic Medicine**INTRODUCTION**

Poison is a material that can injure or kill living organisms when it comes into contact with them or is ingested by them, and it can be employed for this purpose.¹ Acute poisoning is a frequent reason for visits to emergency departments, a leading cause of disease and death in Pakistan, and a global public health concern.^{2,3}

Toxic substances that cause illness, injury, or death may be ingested intentionally or unintentionally, and this can lead to acute poisoning. Many people chose a tranquil death by poisoning rather than hanging or burning themselves to death.⁴ Nonetheless, it may have been avoidable if the proper procedures were taken to prevent them from suicide. The annual suicide rate in the world is 10.5 per 100,000 people.⁵ Insecticides and pesticides are the most commonly used toxic agents, according to the majority of the review.^{4,6,7}

Both intentional and unintentional poisoning can occur. An intentional poisoning happens when a substance is taken or given with the aim of harming another person, while an unintentional poisoning occurs when a substance is taken or given for some other reason. Poisoning instances are on the rise as a result of human lifestyle and social behaviour changes.⁸ Unintentional poisoning resulted in 346,000 deaths globally in 2004, according to a WHO report (3.5 deaths per 100,000 people). Ninety-one percent of these deaths happened in countries with low and middle-incomes. Poisoning by accident claimed the lives of over 7.4 million people in the same year.⁹ A wide range of factors, including socioeconomic level, cultural habits, and industrial and agricultural activities, influence the occurrence and types of poisoning. The most prevalent poisoning agents in industrialised countries are household chemicals and prescribed medications, but in underdeveloped countries, agrochemicals are the most common poisoning agents.^{10,11} In this territory, there is still a lack of knowledge about acute poisoning situations. Keeping this in view we conducted this study in our institution.

MATERIAL AND METHODS

After receiving approval from the hospital's ethical committee the study was carried out. Patients reporting to the Outpatient

Department of Forensic Medicine and Toxicology Liaquat University of Medical and Health Sciences Jamshoro Sindh from January 2021 to December 2021. Cases confirmed as poisoning by chemical analysis report from Forensic Science Laboratory and based on the hospital case sheet records. Cases of poisoning where the corresponding histopathology reports are available. The exclusion criteria was autopsy on unidentified bodies, autopsy on decomposed bodies and cases of poisoning where the Forensic Science Laboratory report, histopathology reports and hospital case sheet records are unavailable.

All patients having a history of poisoning and those that were diagnosed as poisoning following a post mortem examination were selected for medico legal autopsy at the department. For this prospective investigation, a random sample of 100 people was calculated. Officers from the local police department that were involved in the investigation acquired information about the suspect's family history and medical history, if applicable. Chemical analysis reports were used to examine postmortem findings. In treated instances, information was obtained by reviewing hospital records. A visit to the crime scene or images of the crime scene was used to enhance information in circumstances where there was an allegation. Before dissection, all organs were examined and weighed using the Lettulle evisceration technique. The organs were examined and dissected in accordance with the usual autopsy procedure.

The data of certain variables were collected and analyzed in latest version of SPSS regarding age, sex, socioeconomic status, marital status, time and place of consumption, time of survival after consumption, and cause of death. The statistical analysis of the data from this study was carried out using relevant tables and graphs, as well as descriptive statistics such as percentages, in order to present the information in an understandable manner. For the purpose of analysing the acquired data, statistical procedures such as the mean and percentages were used.

STUDY RESULTS

According to the data in the table above, the study population is most poisoned between the ages of 21 and 30, (43%). There were

(42.65 %) of males aged 31 to 40 years, followed by (40 %) (26.47%). There were only 1.47 percent of people in the 0 to 10 and 11 to 20-year-old age groups. Female poisonings occurred in the age categories of 11 to 20 years and 51-60 years, respectively. The lowest percentages were found 3.13 percent for ages 0 to 10 and 71 to 80 years. Males were dominant as compared to females in the sample population. it was 68 percent in men and 32 percent in women as shown in Table 1.

Table 1: Demographics of the study cases

Parameter	Age (years)	Frequency	Percentage
Age	0-10	2	2.00
	11-30	49	49.00
	31-50	42	42.00
	51-70	14	14.00
	71-80	3	3.00
Gender	Male	68	68.00
	Female	32	32.00

Table 2: Frequency of different variable in studied cases

Parameter	Age (years)	Frequency	Percentage
Marital status	Unmarried	32	32.00
	Married	68	68.00
Locality	Urban	92	92.00
	Rural	8	8.00
Family pattern	Nuclear	61	61.00
	Joint	39	39.00
Occupation	Student	25	25.00
	Housewife	16	16.00
	Domestic work	14	14.00
	Office work	13	13.00
	Professional	11	11.00
	Unemployed	6	6.00
	Salesperson	6	6.00
	Others	5	5.00
	Agriculture work	4	4.00
Place of consumption	Residence	87	87.00
	Workplace	3	3.00
	Other places	10	10.00

Table 3: Motivation, suspected poisons and suicidal manner

Parameter	Sub-division of parameter	Pericardial effusion	
		Yes	No
Motivation	Financial	22	22.00
	Love failure	15	15.00
	Ill-health	12	12.00
	Marital	10	10.00
	Unascertained	10	10.00
	Others	9	9.00
	Educational	9	9.00
	Family	7	7.00
Treated	Unemployment	6	6.00
	Yes	54	54.00
Poison suspected	No	46	46.00
	Organophosphorus	21	38.89
	Phosphide ions	6	11.12
	Alcohol	1	1.85
	Sedatives	1	1.85
Manner of	Unknown	25	46.29
	Suicidal	94	94.00
	Alleged	4	4.00
	Accidental	2	2.00

DISCUSSION

Poisoning fatalities are an unavoidable element of all unnatural deaths in today's world of cultural, social, and personal dilemmas. Poverty, stress, financial insecurity, unemployment, personal disputes, psychological disorders, difficulties in psycho-social adaption, bad health and loneliness all play a key role in the ever-increasing mortality rate in poison deaths.

In current study mostly cases i.e. males it amounted to 68% and females 32%. This can be credited to the point that males who form the majority of the population, being the breadwinner of the

family, have to shoulder many responsibilities leading to their risk-taking and aggressive behavior making them more vulnerable. Whereas, women who are considered as the weaker sex and in virtue of Pakistani culture, social values and post-marital problems in the form of cruelty by husband/in-laws are falling prey to suicides by poisoning. Similar findings were observed in the study conducted by Kanchan T, Menezes RG¹² and study conducted by Vijaynath V, et.al¹³ In this study, the maximum number of cases i.e. 37 were in the age group of 21- 30 years (33.63%), followed by 19 in the age group of 31-40 years (17.27%). Ambition, adventurous mind, aggressive personality, opportunity hunting, academic pressure and challenges, allure of opposite sex affect the above said age group. Study conducted by Singh B, Unnikrishnan et al.¹⁴ In our study, place of residence was the most common place of occurrence of incident as seen in 93 cases i.e. 84.54%. Dipayan et al.¹⁵ noted similar findings in his study. The present study shows that 84.54% of cases i.e. 93 were suicidal in nature. Accidental poisoning constituted 14 cases (12.72%) and 2.72% of cases (3 cases) were homicidal in nature. Singh B, Unnikrishnan B¹⁶ have noted similar findings.

The most common poison encountered in this study was Organophosphorus group of insecticide in 55 cases (50%), followed by Phosphide ions in 33 cases (30%). Easy availability over the counter as well as an accessible poison in the form of insecticides especially in the house of farmers, cost effectiveness, fatal nature of the compound, awareness about toxicity of compound among general population make organophosphorus compound the most common poison encountered. Its effectiveness as a rodenticide, regular use in grain storage, unsafe storage practices and easy accessibility as a household poison especially among women, makes Phosphide compounds second most popular. The findings are in accordance with the findings observed in the study by Shetty AK, Jirli PS, Bastia BK¹⁷ and Somnath Das, Subhasish Saha, Debasish Guha et.al¹⁸. Opposing findings were noted in the study by Shadnia S, Esmaily H, Sasanian G et.al¹⁹. where the most common agent was drugs. In the study by Lan Zhou, Liang Liu, Lin Chang et. al.²⁰, the most common poison was the rodenticide tetramine and in the study by Sharma BR, Nidhi Relhan, Neha Gupta et.al.²¹, the most common poison was aluminium phosphide.

CONCLUSION

The most common form of poison taken by this research cases is organophosphorus pesticides. Males are more likely to be poisoned than females. In both rural and urban communities, married people outnumbered single people. Based on the information provided by the police and families of the deceased, the suspected type of poison in the majority of the victims remained unclear prior to autopsy.

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