

An Audit of Deaths From Poisoning: A Retrospective Study

Original Article

Arzoo Rahim,¹ Asma Azim,¹ Moez Munawar¹

1. Student, 3rd Year MBBS, King Edward Medical University, Lahore, Pakistan



ABSTRACT

Background: Poisoning is being more frequently encountered nowadays, both globally and locally. Knowing what poisons are involved more commonly and what kind of victims present with this condition, helps the clinicians to manage and treat the patients in a better manner and lessens the mortality rates.

Objectives: To determine the age group and gender most vulnerable to fatal poisoning. To identify the agent used for poisoning.

Material & Methods: The descriptive retrospective study was carried out at King Edward Medical University, Lahore, and reviewed the autopsy records of victims of fatal poisoning from January 2018 to December 2019. The data were analyzed using the SPSS software.

Results: In the total 67 cases of poisoning that were studied, the majority of the victims were males (85.07%). Most of the cases fell in the 21-30 years age group (53.73%), followed by the 31-40 years age group (23.88%). The overall mean age of the victims was calculated to be 32.597 years. Morphine was found to be the toxic agent in most cases (32 cases; 47.76%), followed by Dextromethorphan (26 cases; 38.80%) and codeine (19 cases; 28.35%).

Conclusion: Poisoning is a serious issue that is more frequently encountered in our young adult and male population. Since narcotics were found in a major share of the cases, measures should be taken for more strict control.

Keywords: Poisoning, Autopsy, Mortality, Drug toxicity, Drug Overdose

INTRODUCTION

Poisoning is an emerging problem that is being dealt with more frequently in the emergency department as compared to the past.[1] Unintentional poisoning claimed the lives of 180,000 people in 2010 according to a study.[2] And in 2012, this number increased to 193,460 according to data from World Health Organization. This data shows an escalation globally that is significant for health care professionals dealing with these patients. And signifies that this possibility

must be kept in mind when a patient presents to them in a hospital.

The agent used for poisoning may be selected based on its accessibility, its properties, or the route of administration among others.[3] Over time, however, there has been a shift in trend regarding the agents which have been used for this purpose. The emergence of new drugs and the easy availability of certain over-the-counter drugs have contributed to it. Pesticides are the agents commonly identified in poisoning-related mortalities in developing countries.[4] The reason behind this may be that in these countries, the economy is agriculture-based, and these agents are accessible to the general populace, many of whom do not know about the precautions they should take while using them.

Poisoning-related mortalities should not be overlooked. This is important because a survey conducted in Pakistan identified

poisoning as the second commonest cause behind unintentional injuries in individuals aged 5 years and above, showing that this as much of a problem nationally as it is on a global scale.[5] This emphasizes the need for elaborate research in this domain. This will lead to better management of the poisoning victims and improved healthcare standards.

Our study aims to identify the age group and the gender of the people in which poisoning or drug toxicity ultimately led to their demise. It also works towards pointing out the agents or the drugs identified in the poisoning victims.

MATERIALS AND METHODS



CORRESPONDING AUTHOR

Arzoo Rahim
C/O Department of Forensic
Medicine, KEMU, Neela
Gumbad, Anarkali Lahore.

Author Email:
drivemycar99@gmail.com

ORCID:
<https://orcid.org/0000-0002-8664-3589>



doi: 10.37978/pjism.v1i4.140

Submission: Apr 18, 2020
Acceptance: Feb 26, 2021
Publication: Mar 10, 2021.



This descriptive, observational study was conducted at the Department of Forensic Medicine and Toxicology, King Edward Medical University, Lahore. One of the duties of this department among others is to perform the autopsies of dead bodies. This retrospective study encompasses data from January 2018 to December 2019.

The study used non-probability purposive sampling method. Those cases in which the cause of death was not poisoning were excluded. The autopsy records and the reports from the toxicology section of Punjab Forensic Science Agency (PFSA) of all the cases in which the cause of death was declared to be poisoning or drug toxicity were examined. From the autopsy record files, the age, gender, year of the autopsy, and agent identified were noted. Before conducting the research, approval was obtained from the Institutional Review Board.

The data was collected and then analyzed statistically using the Statistical Package for the Social Sciences (SPSS) software. These statistics were documented as mean with standard deviation.

RESULTS

During the time frame of this study, i.e. 2 years, a total of 67 cases of poisoning were identified on autopsy and documented; 30 cases in 2019 and 37 cases in 2018. The majority of the victims were males (85.07%), and the females made up the remaining cases (14.92%)[Figure 1]. The majority of the cases fell in the 21-30 years age group (53.73%), followed by the 31-40 years age group (23.88%). There was no case found in the 0-10 years age group, and the number of cases lying in the 11-20 years age group was also few (4.47%). The overall mean age of the victims was calculated to be 32.597 years. So, it can be said that males are predominantly presenting with poisoning and drug toxicity and that most of the victims are falling in the 21-30 years age group[Table 1]. Many different toxic agents were discovered on autopsy and toxicology analysis. Morphine was found to be the toxic agent in most cases (32 cases; 47.76%), followed by Dextromethorphan (26 cases; 38.80%) and codeine (19 cases; 28.35%). Only one case each of cyanide, black stone, cannabis, papaverine, ecstasy, Levorphanol, and certain other agents were identified[Figure 2].

DISCUSSION

In the present study, one of the objectives was to demonstrate the gender and the age group of the victims that have died from poisoning in the past two years. Males, aged between 21-30 years, accounted for 85.07% of the cases that were studied. This was

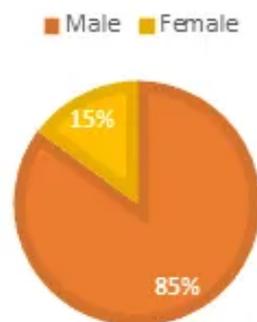


Figure 1: Gender distribution among the poisoning mortalities

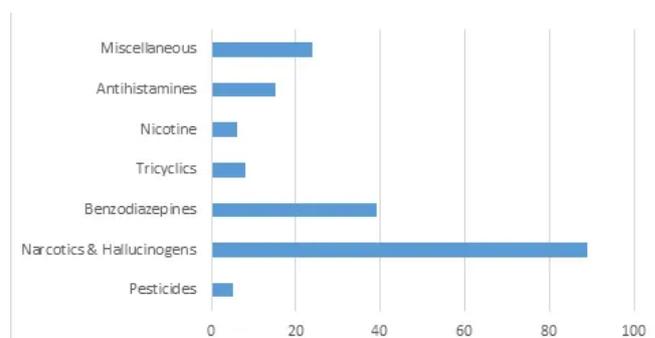


Figure 2: Substances involved among the poisoning mortalities

followed by the 31-40 years age group. This means most of the younger age groups are exposed to various drugs and toxins. This may be due to low socio-economic status, curiosity, stress, peer pressure, and the list goes on. In a 25-year autopsy study conducted by Dalbir Singh et al in Northern India, the victims were mostly males (69%) and the most vulnerable were the ones between the ages of 14 and 30 (68%). In another study carried out in Jamaica, there was a male preponderance, and the 20-29 years individuals were most frequently affected.[6,7] A 10-year Indian study also demonstrated that maximum cases (49.07%) fell in the 15-25 years age group. It also shows a higher percentage of male victims than females.[8] This supports the idea that the youth are the ones that are making up the majority of poisoning mortality cases.

The present study shows that morphine is the agent most commonly detected in poisoning mortalities. This indicates a changing trend, as most cases were found lying in the narcotics and hallucinogens category. Morphine was followed by Dextromethorphan, a cough suppressant, and codeine. Relatively fewer pesticides & insecticide poisoning cases were seen. This is in contrast to other studies carried out for this purpose. For example, in a study carried out in Western India, maximum deaths were due to agricultural products (82.8%), predominantly by organophosphates.[9] Nevertheless, drug toxicity was reported in 10.8% of cases and was found to be the second commonest cause. The drugs abused were mostly NSAIDs and antipyretics. However, it should be pointed out there

Age (years)	No. of cases	%age
0-10	0	0
11-20	3	4.47
21-30	34	53.73
31-40	16	23.88
41-50	7	10.44
51-60	5	7.46
Total	67	100

Table 1: Age distribution of poisoning cases

has been a rising trend in opioid-related overdose deaths in the world. An American study points out that there has been an almost fourfold rise in opioid overdose deaths from 1999 to 2008.[10] A study in Florida documents that the mortality rate from prescription drugs has risen about 84.2%, and that the death rate from prescription drugs has shown a significant rise as compared to illicit drugs.[11]

In another study conducted in Karachi, most poisoning mortalities were reported due to drug overdose.[12] This is a recent study and it further highlights that the trends are changing. Nowadays, we are more likely to encounter drug poisoning as compared to that by pesticides as past studies signified. But that is not necessarily so. Some studies still show that pesticide-related deaths are more commonplace than that by any other agent, for example, this study in Punjab India showed that they make up 17.6% of all the unnatural deaths.[13]

A 5 year study, conducted in Peshawar, to document the drugs of abuse present at autopsy found Diacetylmorphine (heroin) to be the most commonly encountered substance, making 65.38 %, share of the total cases.[14] This probably points to easy access and heroin addiction trends in that locality. In the present study, we encountered 6 cases of heroin-related deaths.

In this study, benzodiazepines appeared to contribute to death in many cases. Diazepam and Nordiazepam (each contributing 16.4%) were the benzodiazepines mostly responsible. A study conducted in Britain also found Diazepam to be the major contributor to poisoning fatalities from benzodiazepine overdose. [15]

Dextromethorphan-related deaths were found second to morphine. This is an easily available, over-the-counter drug. Its addiction is now rising with time. It

has contributed to poisoning mortalities that have been studied as well.[16]

This study displayed the present trends in age, gender, and toxic agent in poisoning cases. However, it has some drawbacks that future studies can improve upon. Future studies should try to study more cases for better accuracy and judgment. Ours was not a multi-centric study, though it was conducted in that university that received the major share of autopsy cases in the city. A multi-centric study would give us a better idea of poisoning trends in the area.

CONCLUSION

Poisoning is a serious health concern that should be studied more in the future so that we can deal with this better in our health providing setups. A rise in drug overdose-related deaths calls for measures to curb this problem including more stern surveillance, more restricted access to drugs, to name a few. Efforts should also be made to counter the rising trends of poisoning among younger males so that we could have a more productive and progressive society.

REFERENCES

1. Akkose S, Fedakar R, Bulut M, Armagan E, Cebicci H. Acute poisoning in adults in the years 1996–2001 treated in the Uludag University Hospital, Marmara Region, Turkey. *Clin Toxicol.* 2005;43(2):105–9.
2. Chen F, Wen J, Wang X, Lin Q, Lin C. Epidemiology and characteristics of acute poisoning treated at an emergency center. *World J Emerg Med.* 2010;1(2):154.
3. RANA PA, FARRUKH R, MALIK SA, RASHEED A. Incidence of Fatal Poisoning in the City of Lahore. A Retrospective Study During 1984-1988. *Ann King Edward Med Univ.* 2000;6(1).
4. Hettiarachchi J, Kodithuwakku GCS. Pattern of poisoning in rural Sri Lanka. *Int J Epidemiol.* 1989;18(2):418–22.
5. Fatmi Z, Hadden WC, Razzak JA, Qureshi HI, Hyder AA, Pappas G. Incidence, patterns and severity of reported unintentional injuries in Pakistan for persons five years and older: results of the National Health Survey of Pakistan 1990–94. *BMC Public Health.* 2007;7(1):1–7

6. Escoffery CT, Shirley SE. Fatal poisoning in Jamaica: a coroner's autopsy study from the University Hospital of the West Indies. *Med Sci Law*. 2004;44(2):116–20.
7. Singh D, Jit I, Tyagi S. Changing trends in acute poisoning in Chandigarh zone: a 25-year autopsy experience from a tertiary care hospital in northern India. *Am J Forensic Med Pathol*. 1999;20(2):203–10.
8. Singh VP, Sharma BR, Dasari H, Vij K. A ten year study of poisoning cases in a tertiary care hospital. *Indian internet J forensic Med Toxicol*. 2004;2(1).
9. Asawari R, Atmaram P, Bhagwan K, Priti D, Kavya S, Jabeen GA. Toxicological pattern of poisoning in urban hospitals of western India. *J Young Pharm*. 2017;9(3):315.
10. Ostling PS, Davidson KS, Anyama BO, Helander EM, Wyche MQ, Kaye AD. America's opioid epidemic: a comprehensive review and look into the rising crisis. *Curr Pain Headache Rep*. 2018;22(5):1–7.
11. CDC. Morbidity and Mortality Weekly Report (MMWR) – Drug Overdose Deaths – Florida, 2003-2009 [Internet]. July 8, 2011. 2011 [cited 2020 Jun 6]. p. 869–72. Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/m6026a1.htm>
12. Khan NU, Pérez-Núñez R, Shamim N, Khan UR, Naseer N, Feroze A, et al. Intentional and unintentional poisoning in Pakistan: a pilot study using the Emergency Departments surveillance project. *BMC Emerg Med*. 2015;15(2):1–7.
13. Singh SP, Aggarwal AD, Oberoi SS, Aggarwal KK, Thind AS, Bhullar DS, et al. Study of poisoning trends in north India—a perspective in relation to world statistics. *J Forensic Leg Med*. 2013;20(1):14–8.
14. Ali SM, Khalil IU, Saeed A, Hussain Z. Five years audit for presence of toxic agents/drug of abuse at autopsy. *J Coll Physicians Surg JCPSP*. 2003;13(9):519–21.
15. Serfaty M, Masterton G. Fatal poisonings attributed to benzodiazepines in Britain during the 1980s. *Br J Psychiatry*. 1993;163(3):386–93.
16. Logan BK, Goldfogel G, Hamilton R, Kuhlman J. Five deaths resulting from abuse of dextromethorphan sold over the internet. *J Anal Toxicol*. 2009;33(2):99–103.

AUTHOR CRediT

AR: Conceptualization, Methodology, Project administration, Writing – original draft, Writing – review & editing

AA: Data curation, Formal Analysis, Writing – original draft

MM: Data curation, Formal Analysis, Investigation, Writing – original draft

HOW TO CITE

Rahim A, Azim A, Munawar M. An Audit of Deaths From Poisoning: A Retrospective Study. *Pak J Surg Med*. 2021;1(4):e140. doi: 10.37978/pjism.v1i4.140

ACKNOWLEDGEMENT

The authors would like to acknowledge Professor Dr Arif Rasheed Malik, Chairman Forensic Medicine and Toxicology, King Edward Medical University Lahore, Pakistan for his invaluable support during conduction of this study.

ETHICAL CONSIDERATION

This study was approved by the Institutional Review Board of King Edward Medical University, Lahore, Pakistan on 15-02-2020 via letter no 168/RC/KEMU.

CONFLICT OF INTEREST

The author declared no conflict of interest.

E-OP

We Value your Opinions. Register your Opinion to this Original Article by Rahim Aet al. by [clicking here](#).

EDITORIAL TEAM

This article has been subjected to extensive editing and double blind peer review process. The following editors were involved in editing of this article;

Lead Editor: S Nizamani

Editors: A Anwer, A Sarfraz, K Zahra, UA Khawaja,

Proof: K Zahra

Bibliography: A Anwer

Stats: A Sarfraz

PUBLISHER'S NOTE

The views and opinion expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.