An Audit of Deaths From Poisoning: A Retrospective Study

Original Article

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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
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 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
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

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Table 1: Age distribution of poisoning cases

Table 1: Gender distribution among the poisoning mortalities

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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.

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