Original Article

A Study among Chemical Suicidal Victims: Situation Analysis

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Abstract

Background: *Suicide by poisoning is the act of intentionally killing oneself by using various chemical substances and it is the most common and widely used method in developing countries like Bangladesh.* ***Objective:*** *The objectives of this study were to find out the socio-demographic characteristics and possible reasons among the chemical suicidal victims.* ***Materials and method:*** *This was a descriptive type of cross-sectional study, held in the Morgue of department of Forensic Medicine of Dhaka Medical College (DMC), Dhaka, Bangladesh, from July 2016 to June 2018. Victims were selected purposively according to the availability in the morgue of Dhaka Medical College. Data were collected from the relatives of the victims and the verbal consent of the doctors who performed autopsy at DMC morgue.* ***Results:*** *A total of 50 victims of suicide using chemical substances as revealed by autopsy findings from the DMC morgue were enlisted in this study. Victims of suicide not using chemicals were excluded from this study. Half (50.0%) of the suicidal deaths by poisoning cases were aged 20 or below. Majority (66.0%) of the victims was male. Organophosphorus compound was found in 58.0% cases, followed by diazepam (8.0%) and barbiturates (4.0%), after receiving chemical analysis report.* ***Conclusion:*** *Pesticides are the most commonly used suicidal agent particularly in low and middle-income countries like ours. So, social awareness regarding this issue is very much needed.*

Keywords: *Autopsy; Poisoning; Suicide; Victim; Chemical substance.*

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Introduction

Poison is a substance (solid, liquid or gaseous), which if introduced to the living body or brought into contact with any part thereof, will produce ill health or death, by its constitutional or local effect or both.[1] Suicide by poisoning is a major public health concern world-wide.[2] The health of the community is reflected by suicide deaths from poisoning.[3] Suicidal death by using various chemical substances is the most common and widely used method in developing countries.[2] Organophosphorus poisoning has become so common in recent years that it may precisely be referred to as "a Social Calamity".[4]

Any unnatural death, whether it is caused by suicide, an accident, or murder, symbolizes a devastating loss of valuable human life and resources.[5] Bangladesh is a developing country where rural population is mostly dependent on agriculture. In our country, ingesting an organophosphorus substance is one of the most

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popular ways to commit suicide by poisoning.[6] Suicidal death indicates the socio-economical and health status of the community.[7] In developing countries, pesticides are a typical catalyst for suicide following insignificant family issues, and kills the life of about 3,00,000 individuals annually.[8]

Materials and method

This is a descriptive type of cross-sectional study. This study was carried out at the department of Forensic Medicine, Dhaka Medical College (DMC), Dhaka, Bangladesh, at the period of July 2016 to June, 2018. A total of 50 samples were enrolled in this study. Study populations are the deceased upon whom autopsy was conducted. This study was focused upon suicidal death occurred by poisoning of autopsy cases held in the morgue of department of Forensic Medicine Dhaka Medical College, Dhaka, Bangladesh, during the study period. Victims were selected purposively according to the availability in the morgue of DMC. Data was collected from the relatives of the victims and the verbal consent of the doctors who had performed autopsy report at DMC. Ethical clearance for the study was taken from the Institutional Review Board and concerned authority.

Results

Table I shows distribution of the study victims by age, it was observed that half of the victims (50.0%) victims age belonged to ≤20 years. The mean age was found 24.34±11.9 years with ranged from 9-60 years.

Table I: Distribution of the study victims by age (N=50)

Age	Number	Percentage
≤20 years	25	50.0
21-40 years	21	42.0
41-60 years	4	8.0
Mean±SD		24.34±11.9
Range (min-max)		9-60

Table II shows distribution of the study victims by sex, it was observed that 31(62.0%) victims were male and 19(38.0%) female.

Table II: Distribution of the study victims by sex (N=50)

Sex	Number	Percentage
Male	31	62.0
Female	19	38.0

Table III shows distribution of the study victims by family history of suicide, it was observed that two third (66.0%) victims had no family history of suicide but 17(34.0%) victims had family history of suicide.

Table III: Distribution of the study victims by family history of suicide (N=50)

Family history of suicide	Number	Percentage
Yes	17	34.0
No	33	66.0

Figure 1 shows the distribution of the study victims by occupation. It was observed that more than one third (40.0%) victims were student, followed by 9(18.0%) housewife, 8(16.0%) day labor, and others.

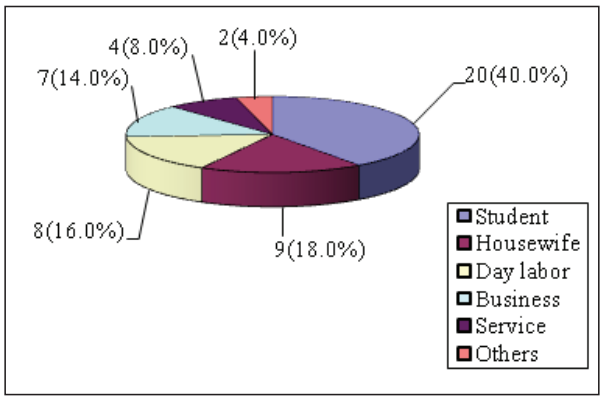

Fig. 1: Distribution of the study victims by occupation

Figure 2 shows number of suicidal poisoning death by different chemicals, after collection of chemical analysis report, organophosphorus compound was found 29(58.0%), diazepam 4(8.0%) and barbiturates 2(4.0%).

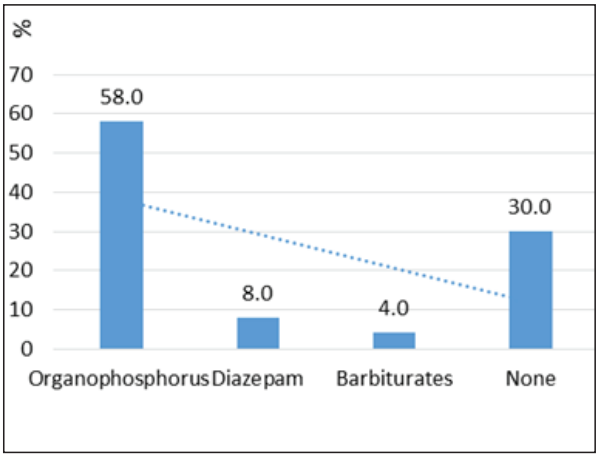

Fig. 2: Bar diagram showing different chemicals used by the victims

Discussion

In this study, it was observed that 50.0% victims age belonged to ≤20 years. The mean age was found 24.34±11.9 years with ranged from 9-60 years. This finding is similar with that of Bari et al.[9] Mean age of the victim was 24.8 ±12.6 years and victims aged 21 to 30 years were the most common age group involved with poisoning (41.6%) followed by patients aged 10 to 20 years (39.1%).[9] In another study Haloi et al. found that most of the victims were in the age group 20-29 years, with 33.33% cases, the lowest number of cases is reported in the age group of 0-9 years 1.04%.[5] According to Meel et al., 51.5% were of age 11-30 years, the victims are frequently affected in the most active periods of their lives i.e. young age.[10] In our country, Hossain et al. found that majority of the victims were within 21 to 30 years age group, which are comparable with the current study.[11]

Regarding the occupation in this present study, it was observed, maximum number of victims were students 40.0%, followed by 18.0% housewife, 16.0% day labor, 14.0% business, 8.0% service and 4.0% others. Singh et al. showed in their study that majority (50%) were unemployed, followed by 29% were employed, and 21% were farmers.[12] Another study reported that the majority of the study subjects were students (43.6%) followed by housewives 28.8% and only 16.1% were engaged in agriculture.[13] In the study of Bansal et al., housewives constituted the largest occupational group (25%) followed by students (15.0%) and 9.0% were farmers.[14] Similarly, Haloi et al. found that 28.1% victim were students followed by domestic worker and house wife from female community with 21.9% cases.[10] Nigam et al. showed the highest incidence of organophosphorus poisoning is seen in persons engaged with agricultural fields constituting 39.60% followed by house wives 20% and students 16.85%.[15]

Self-poisoning constitutes more than half of the total poisoning cases admitted in hospital.[16] Most of the poisoning cases may have some reasons for taking poison. Sometimes the background of poisoning is attributed to mental illness. In this current study, it was observed that 66.0% victims had no family history of suicide whereas 34.0% victims had one. Brent et al. study showed the biggest proportion was associated with positive family history 59.9% and gun in the home in 69.2%.[17] Family history of psychopathology conveyed a risk for completed suicide, even after controlling for psychopathology in the completers, significantly so in the older and male subgroups. According to this, the environmental consequences of having a parent with a psychiatric illness are most likely a mediator of some of the risk associated with familial psychopathology.[17,18] Although the magnitude of the association between family psychopathology and suicide was relatively low, the high prevalence of parental psychopathology makes the identification of youths at risk for suicide through psychiatrically ill parents a logical approach.[17]

Regarding the poisoning methods, it was observed in this present study after collection of chemical analysis report that organophosphorus compound was found in 58.0%, diazepam in 8.0% and barbiturates in 4.0% victims. Singh et al. showed that agrochemicals were the preferred agents with organophosphates alone responsible for maximum (50.0%) suicidal mortalities and followed by aluminium phosphide 40.0% and others 8.0%.[19] The other group included the poisons like organochlorine insecticides, plants and pyrethroids. Only 2% victims those uses drugs to commit suicide. Organophosphates were found to be responsible for maximum mortalities in males and females followed by zinc phosphide (rodenticide) and carbamates. Basic pattern and trend of poisoning shows a regional variation. In another study Haloi et al. observed organophosphorus compounds were the most common agent responsible for poisoning with 22.91% cases followed by organochlorine compounds with 19.79% cases.[10] In India, a study by Palimar and Rastogi found that organophosphorus compound poisoning constituted roughly 5% of the total poisoning deaths, and 77% of the paediatric poisoning fatalities. Thus organophosphates are major contributors to poisoning deaths in childhood.[20]

Conclusion

This study was undertaken to analysis of self-poisoning by pesticide. Various chemical toxic substances or toxic drugs and other households' disinfectants are emerging as an important method of suicide particularly in low and middle-income countries among people with potential mental disorder. Committing suicide by self-poisoning is one of the oldest methods. Suicide is often an impulsive act resulting from the failure to adjust with their surroundings and cope with the stress they are exposed to. Measures to improve the socioeconomic conditions through reforms in the field of education, health, employment and more economic as well as scientific support to cultivators are expected to decrease the incidence of poisoning. Proper education of common people, cultivators about storage, handling, uses of pesticide and insecticide is expected to reduce incidence of poisoning. To eliminate the discrepancies for their manufacture, distribution, sale, storage, and use, the current regulations pertaining to dangerous chemicals should be implemented.

Limitation

1. The study population was selected from a single selected morgue in Dhaka city, so that the results of this study may not reverberate the precise picture of our nation.
2. Poisoning cases are filed as a police issue in Bangladesh; therefore, in some cases, mode of poisoning may not have been reported reliably due to concealment of the proper history by the relatives of the victim.
3. The kind of poisons reported in this study were solely based on the chemical analysis report, autopsy findings, history of the victims' relatives, suicidal note and bottle labels, and police records because it was impossible to determine the precise chemical identity of the toxic agents consumed.

References

1. Reddy KSN, Murty OP. The Essentials of Forensic Medicine and Toxicology. Hyderabad: K Suguna Devi; 2010. p.485-86.
2. Eddleston M. Patterns and Problems of Deliberate Self-Poisoning in the Developing World. QJM. 2000;93(11):715-31.
3. Rahman FN, Ahmad M, Hossain MN, Akhter S, Biswas P. Autopsy Analysis of Suicidal Hanging Cases at Dhaka Medical College. Delta Medical College Journal. 2016;4(1):9-12.
4. Narang U, Narang P, Gupta O. Organophosphorus Poisoning: A Social Calamity. Journal of Mahatma Gandhi Institute of Medical Sciences. 2015;20(1):46.

5. Haloi M, Haloi MD, Patowary A. Death due to Poisoning in District of Kamrup, Assam; A Medico-legal Study. J Indian Aca Forensic Med. 2013;35(1):17-20.

6. Ahmad M, Rahman FN, Ashrafuzzaman M, Chowdhury DK, Ali M. Overview of Organo-phosphorus Compound Poisoning in Bangladesh and Medico-legal Aspects Related to Fatal Cases. Journal of Armed Forces Medical College, Bangladesh. 2009;5(1):41-45.

7. Mortality due to Suicide in Rural Bangladesh. ICDDRB - Health and Science Bulletin (English) - December 2003;1(5):1-3.

8. Eddleston M, Phillips MR. Self-poisoning with Pesticides. 2004;328(7430):42-44.

9. Bari MS, Chakraborty SR, Alam MM, Qayyum JA, Hassan N, Chowdhury FR. Four-Year Study on Acute Poisoning Cases Admitted to a Tertiary Hospital in Bangladesh: Emerging Trend of Poisoning in Commuters. Asia Pacific Journal of Medical Toxicology. 2014;3(4):152-56.

10. Meel BL. Fatalities by Poisoning in the Mthatha Area of South Africa. South African Family Practice. 2007;49(7):17-18.

11. Hossain MN, Rahman Z, Akhter S. Suicidal Death Autopsy Analysis at Dhaka Medical College. Bangladesh Medical Journal. 2011;40(1):18-21.

12. Singh B, Kishore K, Chaudhary AK. Epidemiological Profile of Complete Suicidal Poisoning Cases Autopsied at Autopsy Centre, RIMS, Ranchi. Int J Med Toxicol Forensic Med. 2017;7(1):32-42.

13. Bharati S, Mallik S, Datta PP, Mukhopadhyay A, Datta D, Haq S. Socio-Demographic Profile and Suicidal Intent of Attempted Suicide Cases: A Hospital Based Study in West Bengal, India. Hindu. 2013;135(86.5).

14. Bansal P, Gupta A, Kumar R. The Psychopathology and the Socio-Demographic Determinants of Attempted Suicide Patients. Journal of Clinical and Diagnostic Research. 2011;5(5):917-20.

15. Nigam M, Jain AK, Dubey BP, Sharma VK. Trends of Organophosphorus Poisoning in Bhopal Region an Autopsy Based Study. Journal of Indian academy of forensic medicine. 2004;26(2):62-65.

16. Rahman MM, Khan GK. Clinical Pattern of Acute Poisoning in Medical Units of Dhaka Medical College Hospital. J Dhaka Medical Coll. 1994;3(1):1-5.

17. Brent DA, Baugher M, Bridge J, Chen T, Chiappetta L. Age-and Sex-Related Risk Factors for Adolescent Suicide. Journal of the American Academy of Child & Adolescent Psychiatry. 1999;38(12):1497-505.

18. Gould MS, Fisher P, Parides M, Flory M, Shaffer D. Psychosocial Risk Factors of Child and Adolescent Completed Suicide. Archives of General Psychiatry. 1996;53(12):1155-62.

19. Singh B, Kishore K, Chaudhary AK. Epidemiological Profile of Complete Suicidal Poisoning Cases Autopsied at Autopsy Centre, RIMS, Ranchi. Int J Med Toxicol Forensic Med. 2017;7(1):32-42.

20. Palimar V, Rastogi P. Organophosphorus Compound Poisoning Deaths in Children: An Autopsy Survey from Manipal. Journal of the Indian Society of Toxicology. 2010;6(2):37-39.