Epidemiological Profile of Fatal Poisoning Autopsy Cases Conducted at Gims, Kalaburagi, Karnataka- A Retrospective Study

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Abstract

Background- Pesticide poisoning is a major public health problem worldwide, with thousands of deaths occurring every year, mainly in developing countries. Its usage has been increased in recent past leading its misuse to commit suicide. The aim of this study was to determine the profile of fatal poisoning cases in and around Gulbarga district & to find out its correlates.

Methodology- The present study is a retrospective study of fatal poisoning autopsy cases performed at GIMS, District Hospital, Kalaburagi, Karnataka from January 2018 to December 2018. During this period a total of 647 autopsy cases were conducted of which 85 cases were due to fatal poisoning. Relevant information and subjective data like age, sex, marital status, religion, seasonal variation, type of poison consumed and manner of death have been collected from medicolegal autopsy register, police inquest and treatment history using a predesigned proforma.

Results- A total of 647 cases were autopsied during the year Jan 2018-Dec 2018. Out of 647 cases 85.9% cases were due to unnatural deaths of which 85 cases (13.1%) were due to suspected poisoning. In our study males outnumbered females with 67 cases (78.8%) compared to females with 18 cases (21.2%), maximum number of cases were in the age group between 21-30 years with 36 cases (42.4%). Maximum number of cases were from rural locality with 69 cases (81.2%) & majority of poisoning cases were seen during summer with 42 cases (49.4%). Maximum number of deaths were due to suicide (95.2%) followed by accidental poisoning (4.8%). Majority of poisoning cases were seen in Hindu population (82.3%) and maximum cases were seen in married people (74.1%).

Conclusion- Agrochemical pesticides especially Organophosphorus compounds are responsible for most of the poison related fatalities, which is seen in our present study. Strict legal enforcement in selling and handling of agrochemicals is the need of the hour, and establishment of poison detection centres and early management of poisoning cases at all hospitals, primary health care centres could considerably minimise the morbidity and mortality due to poisoning.

Keywords- *Pesticide poisoning, Suicide, Medicolegal autopsies.*

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Introduction

Poison is a substance that causes damage or injury to the body and endangers one's life due to its exposure by means of ingestion, inhalation or contact.[1] Poisoning is a major public health problem worldwide, with thousands of deaths occurring every year, mainly in the

developing countries. In the last few decades, owing to tremendous advances in the fields of agriculture, medical pharmacology and industrial technologies, there is increase in the incidence of poisoning. Acute poisoning due to accidental and suicidal exposure causes significant mortality and morbidity throughout the world. According to World Health Organization (WHO), globally more than three million of acute poisoning cases with 2,20,000 deaths occur annually.[2] It has been estimated that, in India five to six persons per lakh of population die due to acute poisoning every year.[3]

Organophosphorus (OP) compounds cause most common suicidal deaths in southern, central India.[4] In northern India, Aluminium phosphide causes most deaths.[5,6,7] In general, accidental poisoning is more common in young children, whereas suicidal poisoning is more common in young adults.[8] In developed countries, the rate of mortality from poisoning varies from 1 to 2%, while in India the incidence is alarmingly high at 15-30%.[9] The aim of this study is to determine the epidemiological profile of fatal pesticide poisoning in and around Gulbarga district as this part of Karnataka has large agriculture area taking into account demographic data, place of consumption, type of poison involved and the manner of poisoning.

Material and Method

The present study is a retrospective study of fatal poisoning cases autopsied at the mortuary attached to Gulbarga Institute of medical sciences, Kalaburagi, Karnataka, India from January 2018 to December 2018. Detailed information regarding the circumstances of death was collected from inquest, panchanama, hospital records and medico legal autopsy register. During the study period 647 medico legal autopsies were conducted in the mortuary of district hospital, Kalaburagi of which 85 cases were due to poisoining. Data was compiled and analyzed as per age, sex, marital status, religion, calendar month, residence, & manner of death using a predesigned proforma.

Results

A total of 647 medico legal autopsies were conducted during the period of 1 year from January 2018 to December 2018. Poisoning cases constituted 85 in number (13.1%). Males outnumbered females with 67 cases (78.8%) compared to females with 18 cases (21.2%). It was observed in the study that the maximum number of cases in both sexes were in the age group between 21-30 years with 36 cases (42.4%) followed by the age group of 31-40 years and 41-50 years [Table 1 & 2].

Table 1: Age wise distribution of cases

Age (years)	No. of Poisoning cases	Percentage
<20	08	9.4%
21-30	36	42.4%
31-40	24	28.2%
41-50	12	14.1%
>50	05	5.9%
Total	85	100

Table 2: Sex wise distribution of cases

Gender	No. of Poisoning Cases	Percentage
Male	67	78.8%
Female	18	21.2%
Total	85	100

From Table 3- Majority of cases were from rural locality with 81.2% of cases and 18.8% cases were from urban locality.

Table 3: Distribution of Cases according to Residence

Region	No. of Poisoning Cases	Percentage
Rural	69	81.2%
Urban	16	18.8%
Total	85	100

From Table 4- Out of 85 poisoning cases autopsied, 74.1% cases were married and 25.9% cases were unmarried.

Table 4: **Distribution of Cases according to Marital Status**

Status	No. of Poisoning Cases	Percentage
Married	63	74.1%
Unmarried	22	25.9%
Total	85	100

From Table 5- Out of 85 poisoning cases autopsied, 95.2% cases were due to suicide followed by 4.8% cases were due to accidental poisoning.

Table 5: Distribution of Cases according to Manner of death

Manner of death	No. of Poisoning Cases	Percentage
Accidental	04	4.8%
Suicidal	81	95.2%
Homicidal	00	00
Total	85	100

From Table 6- Out of 85 cases, maximum number of deaths due to poisoning involved Organophosphorus compounds (72.9%), followed by Carbamate compounds and alcohol (9.4%) & followed by Aluminium phosphide (3.5%).

Table 6: Distribution of cases according to type of poison consumed

Type of Poison	No. of Poisoning Cases	Percentage
OrganoPhosphorus	62	72.9%
Carbamate	08	9.4%
Organochlorine	03	3.5%
Aluminium Phosphide	03	3.5%
Alcohol	08	9.4%
Others	01	1.3%
Total	85	100

Discussion

During the study period, a total of 647 cases of medico legal autopsies were performed at District hospital mortuary, GIMS, Kalaburagi. Out of 647 cases, 85 cases were due to poisoning. The incidence of poisoning in the present study was 13.1%, which is comparable to other studies.[10,11,12] Males outnumbered females with 67 cases (78.8%) as compared to females with 18 cases (21.2%) which is similar to studies by Basude et al[9], Mrinal Haloi et al[13], Srivastava et al.[14] This high proportion of poisoning among males might be due to modern life style, cultural patterns in this area, familial, social, psychological and financial problems. These findings are also similar to findings of other studies conducted by Gunnar DG et al[15] at Gulbarga which shows that 65.65% of cases were males. According to study of Vinay Shetty[16] 51.5% of cases were males.

In our study maximum number of fatal poisoning autopsy cases was in the age group between 21-30 years. These findings are in consistency with findings of other authors.[10,11,15,16] This age group was the most active one, physically, mentally and socially and therefore more prone to stressful situations in life. In our study commonest manner of poisoning was suicidal with 81 cases (95.2%), followed by 4 cases (4.8%) due to accidental poisoning. Higher suicidal rate was found among males compared to females. The reasons for the suicide in males include lack of employment, poverty, high degree of stress in academic, financial and social sectors. Higher suicidal rate among males than females were similar with other studies done by Sharma et al[12] and Dash et al.[17]

According to this study maximum number of poisoning cases were seen in Hindu population with 70 cases (82.3%) followed by Muslims with 12 cases (14.1%). These findings were in consistence with the findings of Bansude et al.[9] This difference is due to majority of Hindu population in our area. Maximum number of poisoning cases were seen in married people with 63 cases (74.1%) mostly due to marital conflicts, extra marital affairs, followed by unmarried with 22 cases (25.9%) which may be due to unemployment, depression and love failure. These findings were in consistence with the findings of Bansude et al.[9]

In our study we found that Organophosphorus compounds was most common followed carbamates and aluminium phosphide, as organophosphorus pesticides are easily available at a cheap rate in the market. These findings are in consistence with findings by Jesslin et al[18] and Jai prakash et al[19] except for northern regions of India where Aluminium phosphide is reported as the most commonest type of poison.[20] Majority of the organophosphorus pesticides were either easily available at home or purchased from the nearby shops. Maximum number of poisoning cases were reported in summer season with 42 cases (49.4%) followed by rainy season with 25 cases (29.4%). This was similar to the study done by Jesslin et al.[18] Water scarcity during summer leads to crop failure and financial loses which indirectly increases the rate of suicide.

Conclusion

Study conducted at Gulbarga Institute of Medical Sciences Kalaburagi, to know the profile of fatal poisoning

autopsy cases during a period of one year from January 2018 to December 2018 comprising a total of 647 medico legal autopsies of which 13.1% cases were due to fatal poisoning. In our study we found that majority of cases were in 3rd decade of life, males outnumbered females, rural residents were more in number, Hindus being majority in number formed bulk of cases. Maximum number of cases were seen in the period between April-June and the most commonest type of pesticide involved was Organophosphorus compounds. Various other socio-economic factors responsible for high incidence of suicidal poisoning need early Government Policies. Agrochemical pesticides especially Organophosphorus compounds are responsible for most of the poison related fatalities, which is seen in our present study. Strict legal enforcement in selling and handling of agrochemicals is the need of the hour, and establishment of poison detection centres and early management of poisoning cases at all hospitals, primary health care centres could considerably minimise the morbidity and mortality due to poisoning. The sale of agrochemicals and other pesticides should be controlled through strict regulations & implemented by the concerned authorities.

Conflict of Interest- None

Source of Funding- Self

Ethical Clearance- Permission was not taken from IEC as it was a record based study without involving any live subjects or experimentation.

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