Original Article

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Prevalence of Poisoning Cases at Tertiary Care Hospital of a Rural Medical College: A one year Autopsy based Cross Sectional Study

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Abstract

Poisoning is one of the leading causes of death found among the autopsy cases. Our objective of the present study is to measure the magnitude & epidemiology of poisoning cases presented in the mortuary at MGIMS, Sevagram. MGIMS, Sevagram is situated at rural part of the Vidarbha region of Maharashtra, known for Farmer Suicide cases. This study conducted by the department of Forensic medicine of MGIMS, Sevagram include total 48 cases of poisoning on which autopsy is performed by the Authors over the period of one year. Cases were analysed under various parameters like age, sex, type of poison consumed, residential status, month wise distribution, manner of incidence etc. Data is compared with available literature and conclusion was drawn thereafter. Study clearly indicates that rural area where most of the economy is agricultural based and farmer population is mostly prone to poisoning cases and suicide is the most common manner of death.

Keywords: Medicolegal Autopsy; Poisoning; Agrochemicals; Farmer suicides; Vidarbha region.

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Introduction

Poisoning cases constitute a major public health problem, especially in rural area where most of the population have agricultural background. Poisoning is the common method of suicide adopted in India. In 2012, the state of Maharashtra, with 3,786 farmers suicides, accounted for about a quarter of all India's farmer suicides total (13,754) [1]. From 2009 to 2016, a total of 25,613 farmers committed suicide in the state. In present study, focus is on pattern of various poisoning cases coming to the mortuary of MGIMS, Sewagram for post mortem examination. Sevagram is situated in rural part of Vidarbha region of Maharashtra where more than 70% of population is depending on agriculture for their earning. So, study will be helpful for drawing various conclusions regarding pattern of death in poisoning cases. This study will provide an insight to the policymakers, law custodians & community to look into the specific aspects of the cases and to take measures accordingly for benefit of the community and people at larger scale.

Aims & Objectives

To determine the prevalence and sociodemography of the fatal poisoning cases at tertiary care centre situated at rural area.

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Materials & Methods

The study includes cases with alleged history of poisoning only, reported to mortuary of MGIMS, Sevagram and on which post mortem examination was conducted by the authors. Cases which are not reported during the rotational duty of authors & those cases having no history of poisoning are excluded from the study. Total 48 cases were observed & studied. Data is drawn from the history given by the relatives of the patient, police panchnama and post-mortem examination done on the cases. In the present study, information regarding the demographic details of the victim like age, sex, marital status, domicile, time and place of incident were gathered by interviewing the patient's attendants (parents, guardian, relatives, friends, etc.).

Observation and Results

In the present study, maximum victims (25%) were seen in the age group of 41-50 years, followed by 20.83% cases in the age group of 21-30 years. Males with 41 (85.41%) cases outnumbered the females 7 (14.58%) cases (Table 1). Among all poisoning cases, maximum cases (87.5%) were from rural areas and 6 (12.5%) cases were from urban areas (Table 2). Out of total 48 cases, 31 (64.58%) cases were farmer by occupation & 17 (35.32%) cases were non-farmer (Table 3). Out of 48 cases of poisoning, maximum cases (52.08%) occurred during July to Oct (rainy season), followed by 12 (25%) cases in March to Jun (summer season) and least number of cases 11 (22.91%) occurred in Nov to Feb (winter season) (Table 4). Commonest manner of poisoning is suicidal (85.41%) followed by accidental (14.58%), (Table 5). Maximum cases (58.33%) were of Agrochemical poisons, followed by Rodenticide 6 (12.5%) cases and in 8 (16.33%) cases, type of poison consumed remained unknown (Table 6).

Table 1: Distribution of Poisoning Cases According to Age & Sex (N=48).

Age in Years	Male	Female	Total (%)
<10	0	1	1 (2.08%)
11-20	1	2	3 (6.24%)
21-30	10	0	10 (20.83%)
31-40	6	2	8 (16.64%)
41-50	11	1	12 (25%)
51-60	9	0	9 (18.72%)
61-70	2	1	3 (6.25%)
> 70	2	0	2 (4.16%)
Total	41 (85.41)	7 (14.58%)	48 (100%)

Table 2: Distribution of Poisoning Cases as Per Residence (N=48).

Type of Medico-legal case	Urban	Rural	Total
Poisoning	6 (12.5%)	42 (87.5%)	48

Table 3: Distribution of Poisoning Cases as Per Occupation (N=48).

Occupation	Number of cases	Percentage
Farmer	31	64.58%
Non farmer	17	35.41%
Total	48	100%

Table 4: Distribution of Poisoning Cases According to Month (N=48).

Months	Number of cases	Percentage
March to June	12	25%
July to October	25	52.08%
November to February	11	22.91%
Total	48	100%

Table 5: Poisoning Cases According to Manner of Incidence (N=48).

Manner	Number of cases	Percentage
Suicidal	41	85.41%
Accidental	7	14.58%
Total	48	100%

Table 6: Distribution of Poisoning Cases as Per Type of Poison Consumed (N=48).

Type of poison	Number of cases	Percentage
Alcohol	2	4.16%
Snake	2	4.16%
Agrochemicals	28	58.33%
Phenol	2	4.16%
Rodenticide	6	12.5%
Unknown	8	16.66%
Total	48	100%

Discussion

In the present study, out of total 48 (100%) cases, majority of victims (85.41%) were males. Maximum number of victims (25%) was seen in the age group of 41-50 years and minimum number of victims (2.08%) was found in ≤ 10 years of age group. The results of studies conducted by Dash SK et al. [2], Unnikrishnan et al. [3], Jirli PS et al. [4], Shetty VB et al. [5] & Vanaja K et al. [6] show male dominance and 21-30 years age is most commonly involved group. The studies conducted by Hettiarachchi et al. [7] & Bharadwaj DN et al. [8] revealed male

dominance and common age group involved was 15-25 years. The present study along with many other studies mentioned above, gives the picture of male dominance but considering the age our study is somewhat contradictory to these study. In present study most commonly involved age group is 41-50 years. Reason for this may be that most of the studies includes majority of live cases, while our study consist of only dead cases on which medico legal autopsy is performed. Agrochemical is strong poisonous compound and which is responsible for death in majority of cases and this compound is commonly available with rural/farmer population. Present study is conducted at rural institute and obviously the cases of rural/farmer background are more. In most of this age group, it is suicidal intent rather than accident which is killing factor and which is also a big loss to any society or nation. Person belonging to this age group is sole responsible person towards various issues regarding his family and most of time he is only earning person in family of 5-6 members. Reasons seem to be many like mental instability and inability to face adverse eventualities in life like unemployment, failure of crops, draught conditions, family disputes, and education of children, health issues, and unsettled debt and so on.

It is evident from the present study and other studies, that the males are more prone for poisoning. Females are well guarded from adversities of life, starting from childhood up to old age, as daughter by parents, as wife by husband and as mother by son. The Indian society, traditionally & culturally is sympathetic to women which boosts their morality and self confidence in life. Man being the bread winner of the family in most cases, all transactions go in his name. If failed to fulfil the basic requirements for the family, due to frustrations they end their lives.

In our study, maximum cases (87.25%) were from rural areas and 12.5% from urban areas. This finding is similar to the findings of the study conducted by Dash SK et al. [2] & Shetty VB et al. [5]. As far as occupation is concerned, as per present study, 31 (64.58%) cases were farmer by occupation and 17 (35.32%) cases were non-farmer. As per study by Gupta BD et al. [9], farmers (28%) are the most common victims of poisoning cases. Many other studies also concluded the same. Our study is also consistent with this finding even more as it is conducted at rural hospital where more than 70% population is agriculture dependant and this region is known for more number of farmer suicide. Illiteracy and poverty are the main reasons for that. Another reason may be, due to either lack of water or flood, they may not be able to generate the required income for their day to day living and commitments and they may get frustrated and resort to suicide by these agro-chemicals, which are readily available in their backyard.

As far as seasonal variation is concerned, maximum number of poisoning cases (52.08%) occurred during July - Oct (rainy season), followed by 12 (25%) cases in March to June (summer season) and least number of cases (22.91%) occurred in November to February (winter season). Our results contradict to the results of studies conducted by Dash SK et al. [2], where maximum number of cases occurred in summer season. This seasonal variation with rainy season dominance can be attributed to agriculture and rain. In India, rain is the main source of water for agriculture. All agricultural activity takes place in this season only. Agrochemical, which is most commonly used suicidal agent is readily available with all farmers in this season. This is the period of investment and period of stress for the agricultural population. Failure of adequate rains has become a common phenomenon in most parts of the country with some exceptions. Monsoon failure, high debt burdens, govt. policies, public mental health, personal issues and family problems all collectively increase stress among the farmers. This drought situation is highly unsuited for cultivation. Thus, those families which are totally dependent on agriculture and rains for agriculture face the worst threat for basic needs. Finally, instead of starving to death, they cling on to this method of suicide. Obviously such people use agrochemicals present at their home.

Considering the type of poison consumed, maximum numbers of cases were due to poisoning by agrochemicals (55.08%). This result is similar to the results of the studies Hettiarachchi et al. [7], Unnikrishnan B et al. [3] & Gupta BD et al. [9]. But this result of agrochemical dominancy is in contrast with the result of the study conducted by Bharadwaj DN et al. [8] where the most common type of poisoning was Aluminum phosphide. This result is similar to the studies conducted by Dash SK et al. [2], Jirli PS et al. [4], Shetty VB et al. [5], Vanaja K et al. [6] & Prakash C et al. [10].

In the present study, out of 48 cases of poisoning, the commonest manner of poisoning is suicidal (85.41%) followed by accidental (14.58%). No homicidal case of poisoning was found during the study. Our results are similar to the results of studies conducted by Hettiarachchi et al. [7],

Bharadwaj DN et al. [8], Unnikrishnan B et al. [3], Jirli PS et al. [4], Gupta BD et al. [9] and Shetty VB et al. [5]. It is evident from the present study as well as from other studies quoted above, that in most of the poisoning cases, suicide is the main intention of poisoning. Rural farmers are most commonly involved with agrochemicals as most commonly used agents in developing countries like India and Sri-Lanka. This can be attributed to the fact that, even for trivial problems, people have found suicide as best solution by agrochemicals which are easily available and which could be easily consumed.

Agrochemicals are commonly used, as seen in the present study. This can be attributed to a number of factors like easy availability as they are sold in open market without strict vigil and also much cheaper. The occupation of most victims being agriculture, these chemicals are almost always present in home and readily procurable. These can be easily consumed orally. Another thing that was noticed upon inquiring the hospital victims was that, they were sure of mortality due to these compounds as they have seen many die the same way in their vicinity.

Conclusions

- Study clearly indicates that rural area where most of the economy is agricultural based and farmer population is mostly prone to poisoning cases. Suicide is the most common manner of death. Also the most commonly involved poison (i.e. agrochemicals) is easily available with the farmers during the rainy season.
- So our suggestion is that, government should employ the policy to improve socioeconomic status of the rural population by improving irrigation facility, educational facility, modern farming technique to improve farm production and creating employment among the youth of rural population by investing in secondary agricultural business like dairy, poultry etc.
- Government should introduce less hazardous pesticides in the market and should strictly regulate the sale of the hazardous agrochemicals by all possible methods.

References

1. National Crime Reports Bureau, ADSI Report Annual-2014 GOI, p. 242, table 2.11.
2. Dash SK, Raju AS et al. Sociodemographic profile of poisoning cases. Journal of Indian Academy of Forensic Medicine. 2005;27(3):133-37.
3. Unnikrishnan B, Singh B et al. Trends of acute poisoning in south Karnataka. Kathmandu University Medical Journal 2005 (cited 2014 July 13);3(2):149-54.
4. Jirli PS. A cross sectional study of poisoning cases admitted and autopsied at district hospital, Belgaum (unpublished Doctoral Dissertation, Rajiv Gandhi University of Health Sciences, Bangalore 2001), pp.54-65.
5. Shetty VB, Pawar GS et al. Profile of poisoning cases in district and Medical College Hospitals of north Karnataka. Indian Journal of Forensic Medicine and Toxicology. 2008;2(2):22-26.
6. Vanaja K, Jai prakash V et al. Pattern of poisoning reported at South Indian tertiary care hospital. Indian Journal of Forensic Medicine and Toxicology 2008;2(2):17-19.
7. Hettiarachchi J, Kodithuwakka GCS et al. Suicide in southern Sri Lanka. Med Sci Law. 1988;28(3): 248-51.
8. Bharadwaj DN, Dogra TD et al. Status of poisoning in Faridabad district of Harayana. Medico-legal Update. 2004;4(3):79-83.
9. Gupta BD, Vaghela PC. Profile of fatal Poisoning in and around Jamnagar. Journal of Indian Academy of Forensic Medicine. 2005;27(3):145-48.
10. Prakash C, Joshi G et al. Pattern of poisoning cases admitted at a Tertiary Care Centre in the Kumaon region of Uttarakhand. Indian Journal of Forensic Medicine and Toxicology. 2010;4(1):4-5.