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RESEARCH ARTICLE

DEATH DUE TO SUICIDAL POISONING IN BIJAPUR DISTRICT

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ABSTRACT

Background: Poisoning related deaths were commonly encountered in forensic autopsy. Poisoning related deaths mostly suicidal sometimes accidental and rarely homicidal. **Aim:** To study death due to suicidal poisoning in our area. **Materials and Methods:** This is a retrospective study of 100 cases of death due to suicidal poisoning which underwent Postmortem, from 2008-2018, Al Ameen Medical College, Bijapur. **Results:** In total 100 cases of death due to suicidal poisoning 72 were males and 28 were females with male to female ratio 2.5:1. 21-30 age group is more commonly involved around 52%. Most of the victims are Hindus and from lower socioeconomic group(64%). Observed lethal period is around 6pm-12am (54%), mostly in summer season, Maximum cases educated upto High school (30%). In 94% cases, incidence took place of residence and majority were married(76%). Reasons of poisoning were financial problems (32%), family problems(28%), Unemployment(18%), ill health(8%)psychological ill health (4%), love failure(8%) and Marital unemployment, stress and family dispute. Poison consumed were Organophosphorous(64%), Aluminium phosphide(32%), Pyrethroid(1%), ethyl alcohol (1%), Paraquat(1%) and Alprazolam (1%). In present study external autopsy findings showed cyanosis (72%), froth around mouth(46%), petechial hemorrhage(56%) and injury over body(1%). Specific smell of content of stomach and small intestine being kerosene like in stomach (64%) and small intestine (26%), other findings include congestion in kidney(92%) and liver (87%). **Conclusion:** Suicidal poisoning is more common in younger age group and Organophosphorous is most commonly used poison.

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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 (Reddy, 2011). The nature of poison used varies in different parts of the world and may vary even in different parts of the same country depending on the socioeconomic factors and cultural diversity (Mahabalshetti, 2013). The commonest agents of poisoning in India appear to be pesticides, sedatives, chemicals, alcohol, plant toxins, household poison and snake bite, etc. Of late, aluminium phosphide has begun to emerge as a major player in the toxicological field, particularly in some northern Indian states (Bibhuti Bhusana Panda, 2015). The mortality rate due to poisoning in developed countries is only 1%-2% but in developing countries like India, it varies in between 15%-30% and which is one of the common causes of death, especially in rural areas (Guntheti Bharath, 2011). National data of suicidal deaths showed a number of 134799 cases of suicidal death out of which Karnataka accounted for 11266 cases in 2013. The four metropolitan cities- Bangalore (2033), Chennai (2450),

Delhi(1753) and Mumbai(1322) have reported higher number of suicides (Gopal et al., 2015). In earlier times, the poisoning deaths from pesticides were mainly accidental but easy availability, low cost and unrestricted sale have led to an increase in suicidal and homicidal cases as well (Singh, 2013). The aim of this study was to evaluate demographic profile and mortality pattern in autopsy cases with history of suicidal poisoning in Bijapur district.

MATERIALS AND METHODS

This is a retrospective study of 100 cases of death due to suicidal poisoning which underwent postmortem, from 2008 to 2018, in Al Ameen Medical College Bijapur. Details of suspected poisoning cases were collected from inquest reports, hospital records, autopsy reports and chemical examiners analysis reports of viscera and fluids. The various epidemiology data i.e., age, sex, religion, habit, marital status, education, occupation, economic status, mental status, date and circumstances of ingestion of poison, place of treatment and most common agent responsible for fatal poisoning are studied. The information thus collected was statistically analyzed.

Observation and results: During period of 2008 to 2018, total 120 cases were brought for postmortem examination out of which 100 (83.33%) were deaths due to suicidal poisoning, 2 (1.66%) were due to homicidal and 18 (15%) were deaths due to accidental poisoning. Among the total 100 cases of deaths due to suicidal poisoning 72 were males and 28 were females, Male to female ratio is 2.5:1

Table 1. Age wise distribution

Age group	Number	Percentage
10- 20	5	5%
21-30	52	52%
31-40	18	18%
41-50	12	12%
51-60	8	8%
61-70	5	5%
Total	100	100%

In this study, maximum number of cases belonged to age group 21-30 (52%) followed by 31-40 (18%) and least in age group 10-20 (5%) and 61-70 (5%). 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 (Reddy, 2011). The nature of poison used varies in different parts of the world and may vary even in different parts of the same country depending on the socioeconomic factors and cultural diversity (Mahabalshetti, 2013). The commonest agents of poisoning in india appear to be pesticides, sedatives, chemicals, alcohol, plant toxins, household poison and snake bite, etc. Of late, aluminium phosphide has begun to emerge as a major player in the toxicological field, particularly in some northern Indian states (Bibhuti Bhusana Panda, 2015). The mortality rate due to poisoning in developed countries is only 1%-2% but in developing countries like india, it varies in between 15%-30% and which is one of the common causes of death, especially in rural areas (Guntheti Bharath, 2011). National data of suicidal deaths showed a number of 134799 cases of suicidal death out of which karnataka accounted for 11266 cases in 2013. The four metropolitan cities- Bangalore (2033), Chennai(2450), delhi(1753) and Mumbai(1322) have reported higher number of suicides (Gopal, 2015). In earlier times, the poisoning deaths from pesticides were mainly accidental but easy availability, low cost and unrestricted sale have led to an increase in suicidal and homicidal cases as well (Singh, 2013). The aim of this study was to evaluate demographic profile and mortality pattern in autopsy cases with history of suicidal poisoning in Bijapur district.

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Table 2. Demographic data

Characteristics		Number	percentage
Religion	Hindu	94	94%
	Muslim	4	4%
	Christian	2	2%
Socioeconomic status	Lower	64	64%
	Middle	28	28%
	upper	8	8%
Reason for poisoning	Financial problems	32	32%
	Family problems	28	28%
	Unemployment	18	18%
	ill health	8	8%
	Psychological ill health	4	4%
	Love failure	8	8%
Marital disharmony	2	2%	
Educational status	Illiterate	10	10%
	Primary	21	21%
	High school	30	30%
	Higher secondary	24	24%
	graduate	15	15%
Occupational status	Student	28	28%
	Business	8	8%
	Service	8	8%
	Cultivator	10	10%
	Domestic worker	20	20%
	Labor	8	8%
	unemployed	18	18%
Various habits	No habits	32	32%
	Smoking	24	24%
	Alcohol	18	18%
	Tobacco	16	16%
	Smoking, alcohol and tobacco	10	10%
Time	6am-12pm	30	30%
	12pm-6pm	10	10%
	6pm-12am	54	54%
	12am-6am	6	6%
Season	Summer	54	54%
	Winter	32	32%
	rainy	14	14%
Place of consumption	Residence	94	94%
	Workplace	4	4%
	others	2	2%
Period of survival	>24hrs	48	48%
	Spot death	22	22%
	6-24hrs	18	18%
	<6hrs	12	12%
Marital status	Married	76	76%
	unmarried	24	24%
Treatment	Hospitalized	76	76%
	Not hospitalized	24	24%

In this study, maximum number of cases belonged to age group 21-30 (52%) followed by 31-40 (18%) and least in age group 10-20 (5%) and 61-70 (5%).

Table 3. Autopsy findings and chemical analysis

Characteristics	Findings	Number	Percentage
External autopsy findings	Cyanosis	72	72%
	Froth around mouth	46	46%
	Petechial hemorrhage	36	36%
	Injury over body	1	1%
Internal autopsy findings	Specific smell of content of stomach and small intestine		
	Kerosine like		
	1. Stomach	64	64%
Findings of visceral organ congestions	2. Small intestine	24	24%
	Congestion of		
	1.Kidney	92	92%
	2.Liver	87	87%

Table 4. Toxicological analysis

Substance	Number	Percentage
organophosphorus	64	64%
Aluminium phosphide	32	32%
Pyrethroid	1	1%
Ethyl alcohol	1	1%
Paraquat	1	1%
Alprazole	1	1%
total	100	100%

DISCUSSION

During period of 2008 to 2018, total 120 cases were brought for postmortem examination out of which 100 (83.33%) were deaths due to suicidal poisoning, 2 (1.66%) were due to homicidal and 18 (15%) were deaths due to accidental poisoning. Suicide was the most common manner of poisoning than accidental and homicidal pattern in this study. Data is supported by other authors (Ramesha, 2009; Khan, 2013; Unnikrishnan, 2005). Among the total 100 cases of deaths due to suicidal poisoning, Male victims outnumbered the female victims, the number being 72 and 28 female with male to female ratio 2.5:1. As males lead to a more stressful life than female due to family and responsibility. Males being the breadwinner in majority of family are exposed more frequently to outdoor work and lead a more stressful life than female due to family responsibilities.

This explains the rising suicidal tendency amongst males. Similar findings were observed in the studies conducted by B.k.gopal (2015), S P singh (2013), Bharath, (2011), Mrinal (2013), Adarsh (2001) and mizanur rahman (2010). In this study, maximum number of cases belonged to age group 21-30 (52%) followed by 31-40 (18%) and least in age group 10-20 (5%) and 61-70 (5%). B.k.gopal et al has found that age group between 21-40 years was found to be more vulnerable to suicidal poisoning. This accordance with the study conducted by the others (Gunnell, 2007; Singh, 1984; Singh et al., 1997; Sharma, 2002). Emotional, aggressive, intolerant and irrational behavior among the youth made them vulnerable whereas the least fatality were observed in the victims in the extremes of ages due to limited exposure to poisonous substance (Mahabalshetti, 2013) Active and productive lifestyles make the age group more vulnerable (Bibhuti Bhusana, 2013). Gargi et al observed that male to female ratio was nearly 3:1, majority of the victims were in the age group of 21 to 30 years(45.54%) (Gargi et al., 2006). Dhanya et al stated that male to female ratio is 1.27:1, and maximum victims from the age group 15-30(58.58%) (Dhanya, 2009). Ali et al also found that majority of cases was young people from the age group 16-40 years (around 80%). This age range is a period in which a person is most active in all respects be it family life,

professional life or social life, which increases the stress and often leads to devastating outcomes (Ali, 2012). While Pokbrel et al found that females were more susceptible to intentional poisoning than male. Intentional poisoning for unmarried male was found to be more (34%) than for females. On the contrary, intentional poisoning in females was high in case of married subjects (57%) (Pokhrel, 2008). V.saxena et al showed vulnerability of poisoning among married females is more than married males. However, unmarried females are also more vulnerable than unmarried male subjects (Saxena, 2014). In our study, most of the victims were hindus(94%), muslims(4%) and Christians (2%). This is due to low percentage of muslims and Christian population in our area and as well as their religious belief (Gopal et al., 2015).

More cases were found to be amongst lower socioeconomic status(64%) which is consistent with Gopal et al (2015). While study conducted by B.B.panda et al and other studies supported that it is more common in middle class family (Unnikrishnan, 2015; Dash, 2005). About 60% cases were having family and financial problems as the motive for suicide, which is consistent with Gopal et al. (2015). The rising prices of the basic amenities and inability to meet them financially could be the reason for cynicism in life and also due to the reason for cynicism in life and also due to inability to afford the standard of treatment after exposure. While Mrinal haloi (2013) et al study showed majority of victims belonged to the student community (28.12%), as this group is less exposed to life with worries of study, future unemployment and love affairs. Most of the lethal period of poisoning found to be 6pm-12am(54%), this is consistent with other study(5), due to emotional outburst, resenting from tiredness at the end of busy life and disappointment. In our study, highest number of cases were recorded in summer season(54%) followed by winter, these observations are consistent with studies conducted by Assam (Mrinal Haloi, 2013). Maximum number of cases were educated upto high school level(30%) and rest were illiterate(10%). While study conducted by mrinal et al(12) showed maximum number of cases are educated upto high school level about 28.12% and lowest cases were reported from illiterate group. Analyzing the place and time of consumption most of incidents (94%) took place in residence

because agricultural insecticides were available, that is consistent with other studies (Gopal, 2015; Bibhuti Bhusana Panda, 2015). Availability of plenty of household poisons and secluded environment in home made it the ideal choice of place for poisoning. In the present study most of the cases were married (76%) and unmarried (24%). This is inconsistent with most of the studies, they showed that most of poisoned victims are married (Unnikrishnan, 2005; Dash, 2005; Mittal, 2013). In our study, around 76% were hospitalized for treatment. While study conducted by B.k.gopal showed 58.58% cases were hospitalized for the treatment (Gopal, 2015). Reason for poisoning- present study shows financial problems (32%), family problems (28%), unemployment(18%), ill health(8%), psychological ill health (4%), love failure(8%) and marital disharmony(2%). Similar observation were made by Bibhuti bhusana panda et al. Unemployment, stress and family disputes may lead to such findings. Present study shows substance consumed are organophosphorus (64%), aluminium phosphide (32%), pyrethroid (1%), ethyl alcohol(1%), paraquat (1%) and alprazolam (1%). Similar findings were observed in studies conducted by B.k.gopal et al. (2015), Murari Atul (2002), Reddy NKS (2009), Lan Zhou (2011) and RK Gorea (2009).

In the present study survival cases of more than 24 hours were 48% and in between 6-24 hours (18%) and less than 6 hours (12%) and spot death (22%), which is inconsistent with Gopal et al. (2015). In present study external autopsy findings showed cyanosis (72%), froth around mouth (46%), petechial hemorrhage (56%) and injury over body (1%). Similar study shows that Mrinal et al. (2013) observed external cyanosis, petechial hemorrhage and froth were found in 64.58%, 27.08%, 43.75% of the cases respectively. Kidney (90.62%) was the most common organ of congestion. Present study shows findings to have specific smell of content of stomach and small intestine being kerosene like in stomach (64%) and small intestine (24%). Present study shows findings of congestion in kidney (92%) and liver(87%).

Autopsy findings: Autopsy findings by Pankaj et al shows brain was oedematous and congested in 77.78% of organophosphorus cases and 62.50% of aluminium phosphide poisoning cases. 25% of aluminium phosphide poisoning cases had petechial hemorrhage over lungs. Inner mucosa of stomach was hemorrhagic in more than 80% of the cases of pesticides. Liver was yellowish in colour hard and gritty. On the cut in 22.22% of cases of organophosphorus. Altered corticomedullary junction in kidney was noticed were in organophosphorus poisoning cases than aluminium phosphide poisoning.(30)

Summary and Conclusion

Deaths due to suicidal poisoning were more common in males mostly in younger age group. Most of them were observed in lower socioeconomic population. It mostly occurs in summer season and commonly occurred period being 6pm to 12am. Most of them had financial problems, the commonest reason and organ phosphorus is the commonest poisonous agent.

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