



**To study the demographic profile of poisoning cases admitted in P.B.M. hospital, Bikaner**

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**Abstract**

**Background:** Poisoning is a global public health issue, and one of the common causes for visiting an emergency department (ED). Wide availability, easy access, and extensive use in medical, industrial, household and agricultural applications increase the risk, exposure, and incidence of poisoning.

**Methods:** The present study was conducted on 712 patients in Department of Medicine, S.P. Medical College and P.B.M. Associated Group of Hospitals, Bikaner

**Results:** Mean age in females was 26.19±10.65 years while in males, mean age was 29.00±10.34 and this difference was found statistically highly significant ( $p<0.001$ ). Majority of cases were Hindu ( $n=654$ ) while remaining 58 cases were Muslims. Majority of cases were came from rural area where total 516 cases were found and out of them 208 and 308 cases were females and males respectively while out of total 196 urban area cases, 75 and 121 cases were female and males respectively ( $p>0.05$ ). 211 females were married while 72 females were unmarried and 213, 216 males were

married and unmarried respectively ( $p < 0.001$ ). Majority of cases were came from lower socioeconomic status, 237 cases came from middle socioeconomic status while only 59 cases were came from upper socioeconomic status ( $p < 0.001$ ).

**Conclusion:** Nearly 88% cases were younger than 40 years. Younger age group, agricultural worker, housewives, student were most vulnerable group.

**Keywords:** Poisoning, Age, Sex, Demographic

### Introduction

Poisoning is a global public health issue<sup>1-5</sup>, and one of the common causes for visiting an emergency department (ED)<sup>6-10</sup>. Wide availability, easy access, and extensive use in medical, industrial, household and agricultural applications increase the risk, exposure, and incidence of poisoning<sup>1,10</sup>. The Oxford English Dictionary defines poison as “A substance that is capable of causing the illness or death of a living organism when introduced or absorbed<sup>11</sup>.”

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<sup>12</sup>. Acute poisoning is defined as acute exposure (less than 24hrs) to the toxic substance<sup>13</sup>. 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<sup>14</sup>. It has been estimated that, in India five to six persons per lakh of population die due to acute poisoning every year<sup>15</sup>. Poisoning is the fourth common cause of mortality in India<sup>16</sup>. Pattern of poisoning in a region depends on various factors which include availability and access to the poison, socioeconomic status of an individual, cultural and religious influences, etc.

According to the World Health Organization (WHO), 99 percent of the fatal poisoning cases occur in developing countries, predominantly among the farmers due to various kinds of poisoning, including poisonous toxins from natural products during handling. Therefore, early diagnosis, treatment and prevention are crucial in reducing the burden of poisoning related injury in any country. Very few studies have been done in North India regarding the epidemiology of poisoning as compared to South India.<sup>14</sup>

### Material and methods

**Study Design:** Hospital based cross sectional study

**Study Duration:** 12 months (October 2018 to September 2019)

**Study Place:** Department of Medicine, S.P. Medical College and P.B.M. Associated Group of Hospitals, Bikaner.

**Study Population:** All the patients with any type of poisoning admitted in P.B.M. hospital in general medicine ward and medicine ICU.

**Sampling method:** Consecutive Sampling Method

### Inclusion Criteria

1. Patients with history of poisoning >14 years age admitted to general medicine ward and medicine ICU in study period were included in the study.
2. Written consent given for participation by patient and legal guardian

### Exclusion Criteria

1. Those with improper history of poisoning.
2. In patient having serious co-morbid conditions like COPD, Cardiac disorder, CLD, CKD, Cancer, HIV and terminally ill patient.
3. Snake bite, scorpion sting, insect bite, drug allergy, hanging, etc.
4. Subject unwilling to consent for study.
5. Brought dead case.

**Method of Collection of Data**

- Patients admitted in P.B.M. hospital general medicine ward and medicine ICU with reliable history of poisoning given by the patient himself/herself if conscious or from patient relative and suggestive clinical features if patient unconscious or associated poison container were taken as study subjects.
- A complete history and clinical examination of toxicity of individual compound and certain relevant bio-chemical and other investigations were performed.
- All patients were managed with usual decontamination method including nasogastric lavage and treated according to nature of compound.
- Data were collected from patient case sheet and transfer to data entry format for evaluation.

**Statistical Analysis**

Appropriate statistical analysis was applied as and when required using SPSS software for statistical analysis. Considering the p value (<0.05) as statistically significant.

**Observations**

Table 1: Distribution of cases according to age group (years) in relation to gender

Age Group	Gender				Total	
	Female		Male		No. %	
	No.	%	No.	%		
≤20	108	38.2	100	23.3	208	29.2
21-30	112	39.6	195	45.5	307	43.1
31-40	42	14.8	70	16.3	112	15.7
41-50	9	3.2	50	11.7	59	8.3
51-60	7	2.5	8	1.9	15	2.1
>60	5	1.8	6	1.4	11	1.5

Total	283		429		712	
Mean	26.19		29.00			
SD	10.65		10.34			
t	3.511					
p	<0.001					

Table 1 shows distribution of cases according to age in relation to gender. In present study, out of total 712 cases, 283 were females and 429 were males. So from above table it is clear depicts that male predominance over females. Out of total 283 females, 112 females had their age between 21-30 years, 108 females had their age ≤20 years and 42, 9, 7 and 5 cases belonged to age group 31-40, 41-50, 51-60 and >60 years while out of total 429 males, 195 cases belonged to age group 21-30 years and 100 cases had their age ≤20 years and 70, 50, 8 and 6 cases belonged to age group 31-40, 41-50, 51-60 and >60 years age group.

Mean age in females was 26.19±10.65 years while in males, mean age was 29.00±10.34 and this difference was found statistically highly significant (p<0.001).

Table 2: Distribution of cases according to religion in relation to gender

Religion	Gender				Total	
	Female		Male		No. %	
	No.	%	No.	%		
Hindu	271	95.8	383	89.3	654	91.9
Muslims	12	4.2	46	10.7	58	8.1
Total	283		429		712	
χ <sup>2</sup>	9.576					
p	0.002					

According to religion, majority of cases were Hindu where total 654 cases were found and out of them 271 and 383 cases were females and males respectively while out of total 58 Muslims, 12 and 46 cases were female and males respectively (p<001).

Table 3: Distribution of cases according to residential area in relation to gender

Residential Area	Gender				Total	
	Female		Male			
	No.	%	No.	%	No.	%
Rural	208	73.5	308	71.8	516	72.5
Urban	75	26.5	121	28.2	196	27.5
Total	283		429		712	
$\chi^2$	0.248					
p	0.618					

According to residential area, majority of cases were came from rural area where total 516 cases were found and out of them 208 and 308 cases were females and males respectively while out of total 196 urban area cases, 75 and 121 cases were female and males respectively ( $p>0.05$ ).

Table 4: Distribution of cases according to educational status in relation to gender

Educational Status	Gender				Total	
	Female		Male			
	No.	%	No.	%	No.	%
Illiterate	42	14.8	60	14.0	102	14.3
Primary	84	29.7	98	22.8	182	25.6
Middle	73	25.8	117	27.3	192	26.7
Secondary	76	26.8	104	24.2	180	25.3
Graduate	8	2.8	50	11.7	58	8.1
Total	283		429		712	
$\chi^2$	20.671					
p	<0.001					

In present study, out of total 283 females, 76 females were educated up to secondary level, 73 females were educated up to middle level, 84 females were educated up to primary level and 8 females were educated up to graduation level while 42 females were illiterate.

Out of total 429 males, 104 males were educated up to secondary level, 104, 50 and 117 males were educated up to middle, graduate and primary level respectively while 60 males were uneducated. On applying chi square test, the difference was found statistically highly significant ( $p<0.001$ ).

Table 5: Distribution of cases according to marital status in relation to gender

Marital Status	Gender				Total	
	Female		Male			
	No.	%	No.	%	No.	%
Married	211	74.6	213	49.7	424	59.6
Unmarried	72	25.4	216	50.3	288	40.4
Total	283		429		712	
$\chi^2$	43.918					
p	<0.001					

Out of total 283 females, 211 females were married while 72 females were unmarried while out of 429 males, 213 and 216 males were married and unmarried respectively and this difference was found statistically highly significant ( $p<0.001$ ).

Table 6: Distribution of cases according to socioeconomic status in relation to gender

Socioeconomic Status	Gender				Total	
	Female		Male			
	No.	%	No.	%	No.	%
Lower	130	45.9	286	66.7	416	58.4
Middle	116	41.0	121	28.2	237	33.3
Upper	37	13.1	22	5.1	59	8.3
Total	283		429		712	
$\chi^2$	33.907					
p	<0.001					

In present study, majority of cases were came from lower socioeconomic status where total 416 cases were found and out of them 130 and 286 cases were females

and males respectively, 237 cases came from middle socioeconomic status and out of them 116 and 121 cases were females and males respectively while only 59 cases were came from upper socioeconomic status and out of them 37 cases were females and 22 cases were males. On applying chi square test, the difference was found statistically highly significant ( $p < 0.001$ ).

Table 7: Distribution of cases according to occupation in relation to gender

Occupation	Gender				Total	
	Female		Male			
	No.	%	No.	%	No.	%
Farmer	21	7.4	157	36.6	178	25.0
House Wives	191	67.5	0	-	191	26.8
Labourer	4	1.4	58	13.5	62	8.7
Student	65	23.0	58	13.5	123	17.3
Unemployed	0	-	52	12.1	52	7.3
Other	2	0.7	104	24.2	106	14.9
Total	283		429		712	
$\chi^2$	462.511					
p	<0.001					

Above table shows distribution of cases according to occupation in relation to gender. In females, 191 were housewives, while 65, 21, 4 and 2 females were students, farmer, labourer and other while in males out of total 429 cases, 157 were farmers, 104 had other type of occupation while 58 males each had labourer and student and 52 males were unemployed and this difference was found statistically highly significant ( $p < 0.001$ ).

### Discussion

Pesticide is a major public health problem in developing world. According to WHO data in 2012, 193460 people died worldwide from poisoning most of

which (84%) took place in low and middle income countries.

The present study highlights the trends of poisoning in North-West Rajasthan keeping in mind of various demographic factors.

In present study incidence of poisoning was found to higher in male (60.3%), male to female ratio was 1.52:1. Similar observations were made by Khosya and Meena<sup>15</sup> (61.7% case male), Asawari et al<sup>16</sup> (male to female ratio 1.3:1). However this is contrast to Gupta et al study conducted at Madhya Pradesh where female case of poisoning were more than male. Female to male ratio (1.21:1).

Increasing incidence of poisoning in male may be due to more exposed to occupational hazard, stress and strain due to financial difficulties, loss of job as they are the only earning member of large family.

In present study – incidence of poisoning was very high among young. Out of 712 cases, majority 72.3% cases were younger than 30 and 88.06% cases are less than 40 years of age.

Similar observations were made by Maharani and Vijayakumari<sup>17</sup> (66.6% cases <30 years of age), Gupta et al 72.3% cases were younger than 30 years. Siwach et al<sup>18</sup> reported 70% poisoning case was seen in age group between 15-30years in North India. The high incidence of poisoning in young can be explained by fact that the person of this age group are suffering from stress of modern life style, failure in love, educational, employment related stress, conflict with parents and spouse.

In present study poisoning were more common in rural area (72.5%). Similar observations was made by Khosya and Meena<sup>15</sup> (73.84% cases), Gupta et al (54.83%) and Singh et al<sup>19</sup> (92.5%) cases of poisoning belong to rural area.

This is because most of population in India is still rural and agricultural is main occupation of rural people.

The present study found out 33.7% cases were agricultural worker (Farmer, labourer), 27.5% cases were housewives and 17.3% cases were student.

Similar observations were made by Khosya and Meena<sup>15</sup> agricultural worker 36.5% and housewives 21.7%.

However, in contrast study done by Gupta et al housewives 37% cases of poisoning were more common followed by unemployment student was 26.7%. India being an agricultural based economy, handling of pesticide is routine practice by farmer and their family member due to easy availability of highly toxic pesticide.

Poverty, monsoon failure, financial crisis were responsible for higher incidence of poisoning among farmer and labourer. Factor like dowry, family quarrel, cruelty by the in-laws, marital disharmony, unemployment, economic crisis were responsible for higher incidence of poisoning among housewives.

Failure in exams, unwarranted expectation by parent to perform well in studies and failure in love were common factor that case to higher incidence of poisoning among student.

In present study, poisoning was more common in married people. Out of 712 cases 424 cases (59.6%) were married. Similar fact also observed from other studies like Gupta et al (69.8% cases married) and Batra et al<sup>20</sup> (62.1% cases married).

An early marriage in rural community along with its added family responsibility, social custom, limited resource of income may be factor responsible for married people more prone to stressful condition. This study shows that highest number of poisoning cases were in lower socioeconomic class 416 cases (58.4%)

followed by middle class 237 cases (33.3%) and then upper class 59 cases (8.3%) which was similar to other study.

A season wise variation is seen in our study. Distribution of poisoning cases were highest in raining season 331 cases (46.4%) (June –September). Similar observations was made by Khosya and Meena<sup>86</sup> (62.3%), Singh et al<sup>19</sup> and Prasad et al. This may be due to increased work and labour pressure, financial crisis and increased use and availability of pesticide during that season.

### Conclusion

Nearly 88% cases were younger than 40 years. Younger age group, agricultural worker, housewives, student were most vulnerable group.

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