

ORIGINAL ARTICLE

Pattern of Poisoning in a Tertiary Care Center with Special Reference to Odollam Poisoning

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Abstract

Introduction: Suicide is a major public health challenge in Kerala. Majority of adult poisoning is intentional. Most of those who attempt 'deliberate self harm' are young adults and many a time the reason is trivial.

Objectives: To find out the pattern of poisoning, prognostic factors in different type of poisoning, precipitating factors for deliberate self harm and to suggest preventive measures

Methodology: This was a prospective observational study conducted among patients admitted with history of poisoning in a tertiary care centre in Kerala. Detailed history, physical examination, relevant lab investigations were done in all the patients. Psychiatric assessment and counselling was done in all survivors.

Results: A total of 195 patients were included in this study-109 males and 86 females. The intention of poisoning was suicidal in 98.82% of cases. The mortality rate was 13.33%. Common poisons consumed were odollam, drugs, pesticides and rodenticides. Majority of deaths were due to organophosphorous compounds (42.31%) followed by odollam (38.46%). The common precipitating factors were family problems, personal stressors and marital discord in both sexes. Psychiatric assessment showed adjustment disorder as the commonest problem followed by impulsive act.

Conclusion: The common poisons ingested are organophosphorous compounds, drugs and odollam. Organophosphorous and odollam carries higher mortality. Pesticide regulation, use of less toxic pesticides in agriculture, early management and quick referral to well equipped hospitals will help in reducing mortality. Suicide prevention programmes like psychosocial support and counselling, raising public awareness about deliberate self harm and alcohol de-addiction programmes will help in reducing the incidence of deliberate self harm.

Introduction

Over 800,000 people commit suicide every year and there are many more who attempt suicide.¹ In 2012, suicide was the second leading cause of death among 15-29 year olds globally.¹ WHO estimated that nearly 1,70,000 people commit suicide every year in India.^{2,3} Of these, 29.10% of suicides were due to poisoning (NCRB 2014 report).⁴ The common methods adopted by the patients include ingestion of organophosphorous compounds, rodenticides, drug overdose, vegetable poisons etc.

Suicide is a major public health challenge in Kerala. The suicide rate in Kerala (23.9 out of every 1,00,000

population) is much higher compared to the National rate of 10.6 out of every 1,00,000 population in 2014.⁴ Attempted suicides tend to occur 8 to 20 times more frequently than completed suicides.⁵

Poisoning constitute an important cause of admission to the casualty departments of hospitals. Such admissions carry significant mortality also. Majority of adult poisoning are intentional. Most of those who attempt 'deliberate self harm' are young adults. Psychological analysis of these patients has revealed that many a time the reason is trivial. Hence, there is definitely a case for prevention of such incidents. In this study we tried to find out the pattern of poisoning in adults

admitted to Govt T. D. Medical College, Alappuzha over a period of one year with special reference to the substance used, socio-demographic factors, precipitating factors, prognostic factors and management measures to be adopted.

Objectives

To find out the pattern of poisoning among patients admitted to Medical College, Alappuzha over a period of One year.

To look for prognostic factors in different poisoning cases.

To find out any specific precipitating factors for deliberate self harm and also to suggest preventive measures.

Methodology

This prospective observational study was done at Govt T.D. Medical College, Alappuzha from March 2012 to October 2012. All patients admitted with history of alleged consumption of poison were included in the study after obtaining written, informed consent. The protocol for the study was approved by the Institutional Ethics Committee of Govt. TD Medical College, Alappuzha.

Detailed history was gathered including the nature of poison, time of ingestion, quantity of poison ingested, precipitating causes, past and family history of DSH or psychiatric illness, co-ingestion with alcohol, addictions etc. Further, Socio-demographic factors like education, occupation etc were also recorded. Detailed physical examination was also carried out along with all relevant investigations to look for organ dysfunction based on the type of poison. Psychiatric assessment was done in all the survivors and

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Table 1: Mortality – age wise and sex wise

Age group	Died number (%)	Survived number (%)	Grand total
Females			
< 21 years	0	27 (35.1)	27
21-40 years	6 (66.7)	42 (54.5)	48
40-60 years	3 (33.3)	4 (5.2)	7
>60 years	0	4 (5.2)	4
Grand total	9 (100)	77 (100)	86
Males			
<21 years	0	19 (20.6)	19
21-40 years	7 (41.2)	39 (42.4)	46
40-60 years	7 (41.2)	23 (25)	30
>60 years	3 (17.6)	11 (12)	14
Grand total	17 (100)	92 (100)	109

Table 3: Psychiatric assessment

Row Labels	Psychiatric Assessment	%
Adjustment disorder	76	44.97
Alcohol Related	17	10.06
Depression	26	15.38
Impulsive act	37	21.89
Others	13	7.69
Total	169	100.00

counselling, psychotherapy and medications were provided wherever indicated.

Results

A total of 195 patients were included in the study. Out of this 109 were males and 86 were females with mean age of 37.74 in males and 28.04 in females. Commonest age group was between 21-40 yrs. The intention of poisoning was suicidal in 98.82% of patients. The mortality rate was 13.33% (males-15.59%, females-10.46%).

The common poisons consumed were Odollam (30.77%), Drugs (28.21%), Pesticides (25.13%) and Rodenticides (10.77%). There was only one case of Aluminium Phosphide poisoning and the patient expired. In males pesticides (organophosphorus, organochlorides and carbamates) were the commonest (33.94%) followed by Odollam (27.52%), whereas in females drugs and Odollam were the commonest (34.88%).

Majority of deaths were due to Organophosphates (42.31%) followed by Odollam (38.46%)

Organophosphorus compounds exhibited the highest mortality rate – 30.56%, followed by Odollam – 16.67%. It is seen that the mortality rate of Organophosphorus is nearly double that of Odollam (Table 2).

Among males Labourers, students and skilled workers were common whereas females were predominated

Table 2: Mortality - poison wise

Type of Poison	Died number (%)	Survived number (%)	Grand total number
Drugs	3 (5.2)	55 (94.8)	58
Odollam	10 (16.7)	50 (83.3)	60
Organophosphorus	11 (30.6)	25 (69.4)	36
Rodenticides	2 (9.5)	19 (90.5)	21
Others	0	20 (100)	20
Grand total	26 (13.3)	169 (86.7)	195

Table 4: Mortality indicators - odollam poisoning

Observations	Survivors no. (%)	Deaths cases no. (%)	Total numbers
Bradycardia (PR < 60)	13/50 (26)	7/10 (70)	60
Hypotension (SBP < 90)	4/50 (8)	7/10 (70)	60
Hyperkalemia (SK+ > 5)	12/50 (24)	3/10 (30)	60
ECG changes	24/50 (48)	10/10 (100)	60

by homemakers and students:

The common precipitating factors were family problems, personal stressors and marital discord, in both sexes. Personal stressors were the commonest reason in males (29.55%), whereas females cited family problems as the commonest reason (40.26%).

Psychiatric assessment showed Adjustment disorder (44.97%) as the commonest problem followed by Impulsive act (21.89%), Depression (15.38%) and Alcohol related problems (10.06%) (Table 3).

The common findings observed in Organophosphorus poisoning were vomiting, diarrhoea, smell of kerosene, sweating, bronchoconstriction, miosis, fasciculations and frothing from mouth.

Nausea, vomiting, abdominal pain, bradycardia, irregular pulse, hypotension were the common presenting features in odollam poisoning. ECG changes commonly observed were sinus bradycardia and different degrees of heart blocks. Atrial fibrillation with complete heart block and ventricular tachycardia were observed in two patients.

In Odollam poisoning the incidence of Bradycardia, Hypotension, ECG changes and Hyperkalemia were observed more in those who succumbed. 7 out of 10 deceased patients had taken more than 2 kernels of Odollam. 5 patients had complete heart block and 3 patients had second degree heart block. One each had first degree heart block and atrial fibrillation. 9 out of 50 survivors needed Temporary pacing.

Discussion

Poisoning accounts for about a third of all suicides that occur in India.⁴

Nearly half of these are attributed to insecticides. During our study, common poisons consumed by the patients were found to be Odollam, Drugs, Pesticides and Rodenticides.

In our study pesticides were the most common poison consumed by males. Many other studies have also reported similar findings.^{6,8,9,12,17} In developing countries use of pesticides is poorly regulated. This easy availability without restrictions makes them a popular method of self harm. As observed in other studies also, pesticides were less common in females compared to males. Pesticides are more easily accessible to men which explain the higher usage by males. Many male patients had taken the poison along with alcohol and they sought medical care late and in some cases the symptoms were initially mistakenly attributed to alcohol by the relatives. This also might have contributed to the high mortality. However, compared to studies from North India much lower use of Aluminium phosphide was found in our study.⁷

Compared to other studies from India and other countries we had a higher proportion of patients who had consumed Odollam.⁸ We noticed higher incidence of Odollam poisoning even compared to studies from other parts of South India and Kerala.^{12,20} This could be due to abundance of Odollam around the wetlands of Alappuzha. Young adults were involved in maximum cases, similar to many other studies.^{5,17} Although, adolescents constituted a sizeable group in females, no mortality was reported in this group indicating less lethal poisons were used.

In our study, adjustment disorder and Impulsive acts were most common. Many western studies have reported

high prevalence of psychiatric disorders (92%) and personality disorders in DSH patients.^{11,13-15,19} But, in our study psychiatric disorders were less common.

One significant finding in our study was the high incidence of Odollam poisoning. It was the commonest methods employed by females. The mortality observed in Odollam was 16.67%. Globally plants are an uncommon source of poisoning. However, in some parts of the developing world it is a major clinical problem.^{10,18}

Cerbera Odollam 'suicide tree' belongs to Apocyanaceae family, which is found in many parts of South Asia. This plant is abundantly seen in Alappuzha. It is the green fruit of the plant which is poisonous and it looks like mango. The seeds of Odollam contain Cerberin, cerebroside –cardiotoxins. Odollam is responsible for about 50% of plant poisoning cases and 10% of total poisoning cases in Kerala.¹⁸ It is used mainly for suicidal purpose. The kernel is mashed and taken along with sugar or jiggery as it is very bitter. As this tree is very commonly seen near many houses, the majority of the victims are women. It's easy availability and high lethality makes it a very common suicidal agent even in patients who take it impulsively without any suicidal intention.

In Odollam poisoning, patients usually present with nausea, vomiting, abdominal pain etc. The major effect is the cardio toxicity which includes bradycardia, and various types of heart blocks and arrhythmias. Hypotension is a bad sign and usually indicates myocardial depression. Hyperkalemia is common. These patients are managed with stomach wash, and atropine injections. Hyperkalemia is managed with Insulin glucose regimen. If there is second degree or higher level of heart blocks they are managed with temporary pacing. Digoxin specific antibody has been suggested as treatment in serious cases but we do not have experience of using this.^{10,18} In our study, heart blocks, hyperkalemia, hypotension and ECG changes were more common in those who died. 8/10 patients died had taken more than 2 kernels of Odollam. During hospitalisation these patients were managed with Atropine, measures to correct Hyperkalemia and Temporary pacing where ever needed. Only

very few studies are available about Odollam poisoning. Further, studies are needed to find out more about this lethal poison.

Conclusion

The common poisons ingested are organophosphorus compounds, drug over dosage and Odollam. Organophosphorous compounds and Odollam carries higher mortality. These agents are preferred because of their easy availability.

Pesticide regulation with mandatory colour coding and avoidance of highly toxic pesticides in agriculture will help curbing mortality rates. Early management and quick referral to equipped hospitals where facilities for gastric lavage, administration of antidotes and proper supportive care like Ventilator support will help these patients. Many of the patients committed these acts impulsively and many had adjustment problems indicating that such cases can be prevented by timely psycho social support and expert counselling. Alcoholism plays a significant role –both direct and indirect, in males. De-addiction programmes and de-addiction clinics, support groups like alcoholics anonymous will help these patients. Measures to reduce the universal availability of alcohol and increasing public consensus on pesticide-free farming methods might improve the situation in future. Strict regulations on prescribing and dispensing drugs may help in reducing drug over dosage cases.

Enhancing readiness of Primary Health centres in managing poisoning cases could save valuable lives. Simultaneously, raising awareness among public about the ill effects, symptoms, treatment options and facilities could help in patients reaching care centres without delay. Identifying and keeping under watch of persons at risk of DSH could also be attempted to reduce eventualities. In the case of odollam poisoning it may be very helpful to educate the public about the dangers and the very high toxicity of odollam. Early referral to tertiary care facilities which are equipped to manage complications like cardiac arrhythmias including temporary pacing will help in reducing mortality.

As has been mentioned earlier Only very few studies are available

about Odollam poisoning. The exact mechanism of the cardiac toxicity in odollam poisoning has not been documented by studies. Myocardial depression, digitalis like effect, effects of hyperkalemia have all been attributed to the cardiac manifestations. Autopsy studies have shown presence of haemorrhage on the under surface of inferior wall of myocardium. So further, studies are required to find out more about this lethal poison.

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