

# An Audit of Wheat Pill Poisoning in A Tertiary Care Hospital: A Retrospective Study

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## ABSTRACT

**Background:** Wheatpill is a commonly used suicide drug in developing countries. Due to the easy availability, this drug has played a great role for those people who commit suicide due to various reasons.

**Aim:** To investigate different features such as (Age, Gender, Education, Marital status, Treatment, Location) of all those people who deliberately self-harm by using aluminium phosphide.

**Study design:** Retrospective study.

**Methodology:** Patients (n=83) were enrolled at Teaching Medical Unit, DHQ Teaching Hospital, Sargodha, Pakistan from January 2019 to December 2019 in present study and study tools were age, gender, marital status, educational status, time of arrival, number of days stayed in a hospital, treatment and outcome. Cases were included irrespective of gender. Data analyzed by SPSS 22.0v.

**Results:** Among them 42 are men and 41 were women. 77% of the patients were under 40 years of age and despite taking advantage of all available treatment options, the mortality rate was up to 83% which indicates severe consequences after taking Aluminium Phosphide.

**Conclusion:** This study concluded that this particular aspect of pesticide poisoning was almost exclusively a concern of the developing world where aluminum phosphide was a commonly used and easily available rodenticide. Agricultural activities were undertaken in remote rural areas, which most often lack health-care facilities. Death resulted from cardiogenic shock and hypotension.

**Keywords:** Gender, educational status, time of arrival and treatment efficacy.

## INTRODUCTION

We are living in an era where new advancements are made daily and technology is developing quickly, making human life easier and comfortable. But at the same time mental and psychological health is deteriorating and is reflected in raised suicidal frequency as observed across all races, and ethnicities<sup>1,2</sup>.

Actual suicidal rates are not available in both developed and developing countries because of under reporting.<sup>3</sup> In the developed and privileged world, most of these cases are either due to drug overdose or substance abuse mostly in adolescents and young adults and it has been on the rise since the last decade<sup>4,5</sup>. In less privileged countries situation is no different and is affecting adults of all age groups. Though the ways to commit suicide may be similar that is, drugs and poison, wheat pills remain the most commonly used entity in underdeveloped and developing countries<sup>6,7</sup> in contrast to opiates, anti-psychotics, hypoglycemics and sedatives in developed countries.

Amongst all the pesticides and fumigants commonly used in agricultural fields, Aluminum phosphide, an active ingredient of wheat pills, has the highest case fatality rates. Wheat pills are used to protect grains and are easily available. They are very lethal even in smaller doses and

most of the people who ingest them die because of multi-organ failure. On ingestion, when aluminum phosphide comes in contact with stomach acid, it releases highly toxic phosphine gas, generates free oxygen radicals<sup>1</sup> hence producing toxic effects on the heart and kidneys. Demographics may vary from country to country but most commonly women and adults in reproductive age tend to commit suicide because of myriad issues.<sup>8,9</sup> In our country, the situation is no different where people opt for deliberate self-harm with the intent to end their life whatever the reason may be<sup>10,11</sup>. Aluminum phosphide poisoning is known worldwide especially in developing countries. Its easy availability and low cost have made it one of the leading causes of deliberate ingestion but few cases have occurred accidentally. It is often fatal even in small doses and despite strenuous therapeutic endeavors, death rate is high<sup>9</sup>.

Thus keeping this in mind, the objective of this study was to analyze the prevalence and outcome of wheat pill ingestion associated suicide in Sargodha and correlation with the variables like age, gender, educational status and location, time of arrival and number of days stayed in hospital after ingestion, treatment efficacy and outcome.

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**METHODOLOGY**

Patients (n=83) were enrolled at Teaching Medical Unit, DHQ Teaching Hospital, Sargodha, Pakistan from January 2019 to December 2019 in present study and study tools were age, gender, marital status, educational status, time of arrival, number of days stayed in a hospital, treatment and outcome. Cases were included irrespective of gender. We consider those patients with more than 12 years of age admitted to the Teaching Medical Unit, DHQ Teaching Hospital, Sargodha.

**Statistical analysis:** Data analyzed by SPSS 22.0v.

Parameters including age, gender, marital status, educational status, time of arrival, number of days stayed in a hospital, treatment and outcome were expressed as frequency and percentages.

**RESULTS**

Table-1: Distribution of general parameters among subjects as frequency

Gender	Male	42 (50.6%)
	Female	41 (49.4%)
Marital Status	Married	54 (65%)
	Un-married	29 (35%)
Education	Educated	39 (46.9)
	Un-educated	44 (53.1)
Arrival	Less than 4 hours	55 (66%)
	More than 4 hours	28 (34%)
Treatment	Gastric Lavage Only	14 (17%)
	Combined	69 (83%)
Stay	Less than 2 days	44 (53%)
	More than 2 days	39 (47%)
Location	Rural	44 (53.1%)
	Urban	39 (46.9%)
Outcome	Survived	13 (15.6%)
	Died	70 (84.4%)

We retrospectively analyzed data of 83 patients in a tertiary care hospital. Amongst them 42 were males and 41 were females while distribution of other parameters was shown

in table-1. Age distribution among enrolled subjects was shown in table-2. Around 77 percent of patients were below the age of 40 years. Distribution of enrolled subjects on monthly basis in present study as shown in table-3. Results also stratified that prevalence was more in July and October. We inferred that females of all ages use wheat pills more-often and there is no distinction in the age group. They are also more affected by such pesticides see Figure 1 (a). Similarly in Figure 1 (b), we can see more patients died living in rural areas where such pills are easily available.

Table-2: Total patients with their frequency and cumulative %age by age

Age	Frequency	%age	Valid%	Cumulative%
10-19	17	20.5	20.5	20.5
20-29	29	34.9	34.9	55.4
30-39	18	21.7	21.7	77.1
40-49	12	14.5	14.5	91.6
50-59	2	2.4	2.4	94.0
60-59	3	3.6	3.6	97.6
>70	1	1.2	1.2	98.8
>80	1	1.2	1.2	100
Total:	83	100	100	

Table-3: Total patients with their frequency and cumulative %age by months

Month	Frequency	%age	Valid%	Cumulative%
Jan	2	2.4	2.4	2.4
Feb	5	6.0	6.0	8.4
Mar	3	3.6	3.6	12.0
Apr	4	4.8	4.8	16.9
May	2	2.4	2.4	19.3
Jun	6	7.2	7.2	26.5
Jul	17	20.5	20.5	47.0
Aug	7	8.4	8.4	55.4
Sep	5	6.0	6.0	61.4
Oct	18	21.7	21.7	83.1
Nov	9	10.8	10.8	94.0
Dec	5	6.0	6.0	100.0

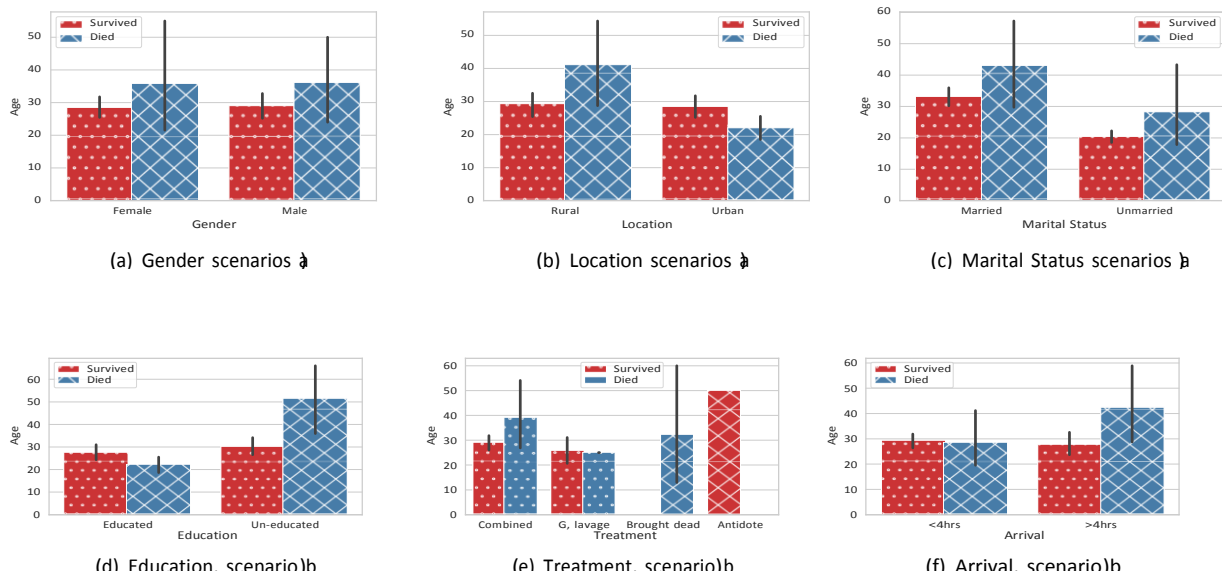


Fig. 1: Bandwidth, scenarios a) (low) and b) (low-high): Resolutions change for 60 video segments

## DISCUSSION

Pesticides are a group of chemicals used predominantly in agriculture. Amongst them, aluminum phosphide commonly called 'wheat pills' are household items in most developing countries and are the commonly employed mean of suicide. In the industrialized world, the problem of acute pesticide poisoning has largely been controlled whereas the situation is still quite alarming in the developing world. We analyzed data of 83 patients retrospectively which demonstrated that most adults in their thirties and forties deliberately took pills with an intent to end their life. Suicidal ideation and rate among females are high as compared to males and multiple factors are responsible for this behavior in our set of a population like social stigma, shame, saving face, family pressure, religious taboos like taweez, dum and sometimes problems of childbearing prevent them from seeking behavioral health care.<sup>12</sup> Also, the ones who opted for poisoning were uneducated, married, and belonged to rural areas as pesticides are part and parcel of agricultural activities of rural areas. Also in these areas, health care facilities are not always available. Other factors like poor marital and social support, stressful life events such as failures and unemployment.

Patients who reached hospital early within a few hours had better chances of survival as compared to those who suffered any delays to medical treatment after ingestion<sup>13</sup>. Early resuscitation with lavage and drugs improved prognosis. Periodic weather variation was also significant as prevalence was more in July which could be attributed to violent behavior in hot, humid weather and the second peak in October due to a high incidence of depression in autumn.

In developed countries, pesticides are responsible for only a small percentage of all poisonings, whereas in the developing countries they are a major contributor to poisoning. In advanced countries, substance abuse and drug over-dosage are more common causes of deaths in adolescents and adults.

In Table-1, we presented data set information. We collect (Gender, Marital Status, Education, Arrival and stay in the hospital, Patient location and finally the outcome). We can see in Table-1 wheat-pill poisoning is more common in married males as compared to unmarried (35%) and females (49.1%). The intake of wheat-pills is more prevalent in uneducated individuals i.e. 65.4% (the cutoff point being middle standard education) which may be attributed to knowledge of more effective toxins in the educated folks. 84.3% people died hence survival rate was very low (15.7%). 55 out of 83 individuals arrived within 4-hours of intake of poison, upon whom 69 were given combination of treatment. The correlation of arrival in hospital and outcome is significant, meaning thereby, the earlier a patient reaches the hospital better are the chances of his recovery; however age has no effect on outcome of poisoning. Wheat-pills poisoning is more prevalent in rural areas (53%) which may be attributed to the agricultural background. Combined treatment (antidote plus symptomatic treatment) is found to be most effective way (83.1% cure rate) of treating wheat-pill poisoning. Outcome of poisoning is also significantly related to the time of the

year see Table-3. This can be attributed to the more poisonous nature of pills as well as the temperament of individuals in harsh weather leading to significant mental health issues leading to suicide. Similarly we can see in Table-2 patients with age range (20-40) had attempted wheat-pills poisoning more frequently.

**Limitations:** Present study had number of limitations like small sample size, financial constrains and limited resources

## CONCLUSION

This study concluded that this particular aspect of pesticide poisoning was almost exclusively a concern of the developing world where aluminum phosphide was a commonly used and easily available rodenticide. Agricultural activities were undertaken in remote rural areas, which most often lack health-care facilities. As compared to the majority of other pesticides available it was the most dangerous one because of direct toxic effects of phosphine gas released in the stomach. Death resulted from cardiogenic shock and hypotension. But because of the unavailability of a specific antidote, all that can be done was resuscitation and supportive care. Though drugs like magnesium sulfate, calcium gluconate have been used worldwide so far there was no concrete proof that any proposed treatment offers any clinical benefit. Suicide in any society is a social problem that requires attention from many disciplines. However, primary health care approach can be regarded as the most suitable for such situations. To reduce case-fatality rates it was prudent to enact and implement legislation to put a restriction on over the counter availability of wheat pills, to identify the vulnerable set of people and offering them psychosocial and socio-cultural support and maybe, in general, the incidence may fall with the introduction of safer and newer pesticides in the market.

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