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COLLAPSING CARDIOVASCULAR AND RESPIRATORY PHYSIOLOGY: INCREASING TRENDS OF WHEAT PILLS (ALUMINUM PHOSPHIDE) POISONING IN RURAL NAWABSHAH, INTENSIVE CARE UNIT BASED OBSERVATIONS

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Abstract:
Study Objective: This study was aimed at determining the frequency and percentage of wheat pill poisoning with its clinical presentation and outcomes in our tertiary care ICU. **Study Design and settings:** It was an observational study conducted in ICU of the People's University of medical and health sciences Nawabshah from June 2023 to December 2023. **Material & Methods:** Patients reported as the suicidal and accidental poisoning with wheat pills were admitted in the ICU and the treatment was provided according to emergency protocols. The required data was collected using the research proforma. Collected data was interpreted and results were generated using statistical package of social sciences 22. **Result:** We admitted 20 patients as the victims of wheat pill (aluminum phosphide) poisoning out of which 10 (50%) were males and 10(50%) were females with a male

female ratio of 1:1 for involvement. There were 7(35%) cases which belonged to 30 years or below age group while 13(65%) cases belonged to the age group above 30 years. Only one patient survived while 19 patients couldn't be saved with a mortality rate of 95%. **Conclusion:** Suicidal Wheat pill poisoning is becoming a common practice in the rural area of this region being an easily available and cheaper option whereas the accidental poisoning with this agent is very rare in this area.

Key words: Aluminum phosphide (Wheat Pills), Suicidal poisoning, accidental poisoning, Outcomes

Introduction

The active compound of the wheat pills is Aluminum phosphide used in houses and in agriculture as fumigant to control the pest being a cheaper insect killer it is a common agent used for suicide in 3rd world countries with no available antidote and treatment guide lines [1,2]. The toxicity results following ingestion and inhalation of mainly the fresh tablets which when get wet release phosphine (a highly toxic gas) which inhibits mitochondrial protein synthesis and the enzymes affecting the major organs of the body, the heart, lungs and the liver [3]. One 3gram tablet contains Aluminum phosphide 56.4% and ammonium carbonate 44.6% and it can release 1 gram of phosphine following contact with HCL in the stomach following ingestion and its 150mg to 500mg are sufficient to cause death [2,4]. Hypoxia at the cellular level occur as the electron transport is blocked by phosphine in cytochrome oxidase non-competitively inhibiting the oxygen carrying capability of the hemoglobin [5]. The rate of mortality associated with wheat pill poisoning is 84% specially reported from the rural areas [6]. Majority of the patients die before reaching the hospital hardly 5-10% of the affected person may reach the health care facilities [7]. The mortality rates in ICU are reported from 55 to 90% while in Pakistan it was reported as 35.3% from KPK province [8]. The sign and symptoms of what pill toxicity include blurred vision, teamers, fits, peripheral and pulmonary edema, cardiac arrhythmias, shock and cardia arrest [9]. Wheat pills poisoning following the suicidal ingestion is commonly reported in young South Asian females [10]. The reported cases at the tertiary care level were reported be hardly 20% of the actual cases occurring at the community level which remain unreported [11]. The data regarding this chemical poisoning is limited from this region of Sindh, Pakistan so we decided to conduct this research study on the ICU admitted emergencies with documented wheat will poisoning. Hopefully our findings will add some new figures on this topic in the available literature.

Methodology:

This research work was conducted in the intensive care unit of the people's University of medical and health sciences Nawabshah (Shaheed Benazir Abad) Sindh, Pakistan after institutional permission. The information was collected in a scientific way on a predesigned research proforma following an informed and written consent from the attendants of the patients. Both quantitative and the qualitative data was collected and analyzed using SPSS Version22 to calculate the measures of the central tendency and measures of dispersion etc. and presented in the form of tables and figures.

Results: We admitted 20 patients as the victims of wheat pill (aluminum phosphide) poisoning out of which 10 (50%) were males and 10(50%) were females with a male female ratio of 1:1 for involvement. The mean age was calculated as 37.5 $\pm$10.3 years with a minimum as 20 years and maximum as 65 years. There were 7(35%) cases which belonged to 20-30 years age group while 13(65%) cases belonged to the age group above 30 years, with the details as in [Table-1], The age group 30-40Years were 05(25%), 40-50 years were 04(20%) and similarly patients belonging to age group 50-60 years were 04(20%). Only one patient survived while 19 patients couldn't be saved with a mortality rate of 95%. The duration of hospital stay was from 1 day to 10 days most of the patients died in the initial 48 hours

Table-1: Various age groups involved in wheat pill poisoning

Age Groups	Frequency and percentage
20-30 Years	07(35%)
30 -40 Years	05(25%)
40-50 years	04(20%)
50-60 years	04(20%)

Table-2: Duration of stay in ICU and Outcome

Days of stay in ICU	Frequency and Percentage	Outcome
1 Day	01(5%)	Died
2 Days	06(30%)	Died
3Days	02(10%)	Died
4Days	03(15%)	Died
5 Days	03(15%)	Died
6 Days	01(5%)	Died
7 Days	01(5%)	Died
8 Days	01(5%)	Died
9 Days	01(5%)	Died
10 Days	01(5%)	Survived

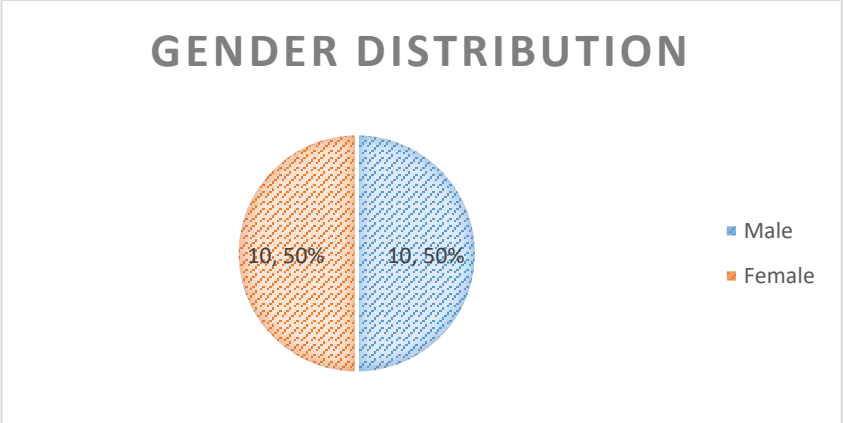
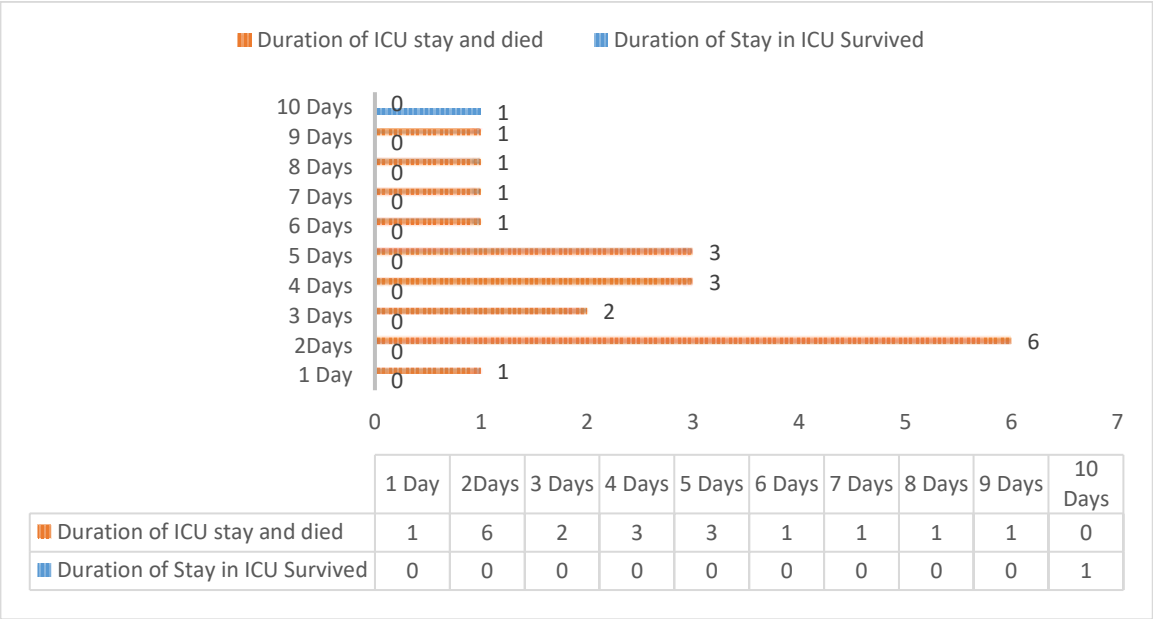


Fig-1: Gender distribution of the study patients



	1 Day	2Days	3 Days	4 Days	5 Days	6 Days	7 Days	8 Days	9 Days	10 Days
Duration of ICU stay and died	1	6	2	3	3	1	1	1	1	0
Duration of Stay in ICU Survived	0	0	0	0	0	0	0	0	0	1

Fig-2: Hospital stay and outcomes of the wheat pill poisoning patients

Discussion:

Studies had reported the mortality rate following wheat pill poisoning as up to 90% Chugh SN et al 2011[12] and Iftikhar R et al 2011[13] which is consistent with the 95% mortality rate in our study. Another Pakistani study by Khan AN et al 2021 reported the mortality rate as 70% which was inconsistent with our observation [14]. This difference between the mortality rates among the Pakistani studies may be due to difference in dose of ingested wheat pills tablets or the early reaching the tertiary care hospital in our study the cases were reported late to the hospital. Young age is more associated with the suicidal poisoning with the wheat pill as we observed and similar observations were reported by some other researchers [15,16]. The main cause of death from wheat pill poisoning is the acid base imbalance, respiratory arrest and cardiac arrhythmias, the same was observed in our study all the patients of wheat pill poisoning were hemodynamically unstable with compromised respiration and disturbed ABGs (arterial blood gases) [17]. Most of the deaths occurred within 48 hours of the hospitalization which is in accordance with the previously reported studies [18]. The poisoning was reported to be the suicidal in our study patients, similar observations were reported from the other parts of the developing world as the pills are easily available and any one can purchase so many countries have made legislation to avoid the easy availability of the wheat pills [19,20]. Proper guidelines should be developed and implemented for sale and use of the wheat pills and other associated poisoning agents in Pakistan and other countries where such cases are frequently reported. There should be training sessions arranged in rural areas in order to educate the common people regarding keeping and handing such chemicals and early hospitalization of the victims in order to save their lives as the higher mortality rates are due to the reasons of late arrival at the hospitals. If the victim is timely brough to hospital the poison may be removed by stomach wash without reaching the systemic circulation.

Conclusion:

Suicidal Wheat pill poisoning is becoming a common practice in the rural area of this region being an easily available and cheaper option whereas the accidental poisoning with this agent is very rare in this area.

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