

# To Evaluate the Pattern, Demographics and Etiologies of Acute Poisoning at A Tertiary Care Centre In Karachi Pakistan

Abdul Ghani, Muhammad Azam Akhter, Muhsbat Ali, Shua Nasir, Lal Shehbaz, Zain Ali

## ABSTRACT

**Objective:** The aim of our study is to evaluate the pattern, demographics and etiologies of acute poisoning at a tertiary care centre in Karachi Pakistan. **Method:** The type of study is a retrospective analysis of hospital record, from April 2013 to April 2016, for a period of 3 years, at a tertiary health care centre at Karachi Pakistan. The data was extracted from the hospital record and patient files, and various variables such as patients age, gender, type of agent used for poisoning, marital status at time of poisoning, date of poisoning, method utilized, time between intoxication and presentation to the emergency department, intentional or unintentional poisoning, clinical outcome and length of stay etc was noted for the patients. Various poisonous, drugs and toxic agents were classified. We also noted whether only a single drug was ingested or multiple drugs were ingested. Data was analyzed using SPSS version 23. **Results:** The study population consisted of n= 796 patients, out of which n= 654 patients were included in the study as the rest of patients had incomplete data. The mean age of patients was 29 +/- 14 years, of the total study population n= 425 (65%) were females having a mean age of 30 +/- 14 years and n= 229 (35%) were males having a mean age of 34 +/- 16 years. The various types of toxicities were distributed as follows, pharmaceutical agents and drugs n= 255 (38.99%), pesticide ingestion n= 276 (42.20%), corrosives n= 26 (3.97%), food n= 52 (7.95%), alcohol n= 32 (4.89%), others n= 13 (1.98%). N= 238 (93.33%) patients took pharmaceutical agents for intentional intoxication and n= 17 (6.66%) did accidental overdose, while in the non pharmaceutical group n= 304 (76.19%) patients took intentionally the toxic agents and n= 95 (23.80%) took the agents unintentionally. Of those patients who took the agents for suicide attempt 82% were females as compared to 70% of males having a p value of less than 0.001. Also the majority of patients who attempted suicide were of young age, less than 28 years old having a p value of less than 0.001, while the majority of patients who in whom the intoxication was intentional were married in 60% of the cases. **Conclusion:** According to the results of our study, the most common agents of suicide used in our region and those who were reported at our setup were over dose of pharmaceutical agents and pesticide ingestion. Most attempts were to cause deliberate harm to self, and most common in the younger demographic especially in young girls, it is recommended that preventive measures and psychological counseling to be done of these patients.

**Keywords:** Poisoning, Overdose, Pesticides, Suicide attempt, self harm, emergency.

### Corresponding Author

**Dr. Zain Ali**

Research Associate

Contact: +92 331-2913458

Email: drzainali88@gmail.com

Submitted for Publication: 05-12-2016

Accepted for Publication: 02-03-2017

**Article Citation:** Ghani A, Akhter MA, Ali M, Nasir S, Shehbaz L, Ali Z. To Evaluate the Pattern, Demographics and Etiologies of Acute Poisoning at A Tertiary Care Centre In Karachi Pakistan. APMC 2017;11(2):89-93.

## INTRODUCTION

Among the most common reasons for a visit to the hospital emergency department is exposure to toxic agents such as drugs and chemicals,<sup>1,2,3</sup> such intentional or unintentional exposures are a major cause of morbidity and mortality around the globe, acute poisoning is a challenge to physicians due to the fact that a huge number of agents can be the cause of such poisoning incidents.<sup>4</sup> Various drugs and toxic agents are available easily in the communities and the patterns of poisoning are different in different parts of the world and may change with time.<sup>5,6,7</sup> Therefore there is a need to be constantly vigilant when it comes to the pattern of poisoning in a population, so as to prepare adequate safeguards and methods for primary and secondary prevention at all levels, as it is a public health

disaster. The aim of our study is to evaluate the pattern of acute poisoning at a tertiary care centre in Karachi Pakistan, evaluating the demographics and etiologies of the patients.

## METHODOLOGY

**Study Design:** The type of study is a retrospective analysis of hospital record.

**Place of Study:** Tertiary health care centre at Karachi Pakistan.

**Period:** from April 2013 to April 2016, (3 years)

**Method:**

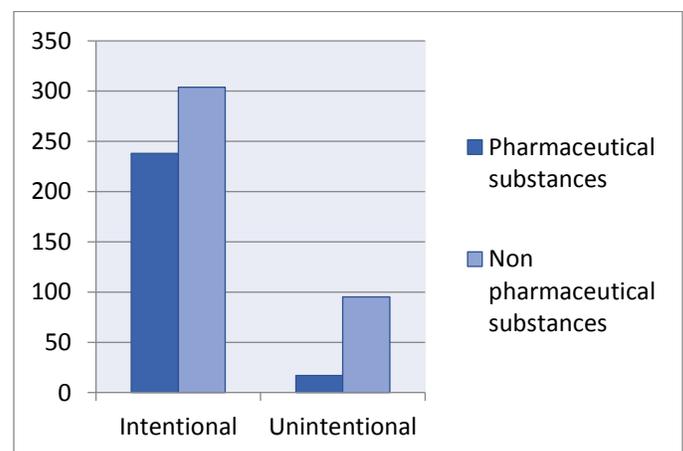
The data was extracted from the hospital record and patient files, and various variables such as patients age, gender, type of agent used for poisoning, marital status at time of poisoning, date of poisoning, method utilized, time between intoxication and

presentation to the emergency department, intentional or unintentional poisoning, clinical outcome and length of stay etc was noted for the patients. Various poisonous and toxic agents were classified, such as pesticides, corrosives, pharmaceutical agents, spirits and alcohols and rotten foods and beverages etc. The drugs was also classified as analgesics, antidepressants, antihypertensive, psychotropic agents etc and the drugs which we were not able to classify were included in the others category (which included antiemetic, anti dyspeptic drugs, drugs for diabetes, hormones, vitamins, muscle relaxant drugs, warfarin and drugs sold over the counter such as for common cold) also a category for unidentifiable drugs was created (which included homeopathic, herbal, Hakeem, ayurvedic, Chinese and other such alternative medications). We also noted whether only a single drug was ingested or multiple drugs were ingested. Data was analyzed using SPSS version 23. Mean and standard deviation was used for quantitative variables while frequency and percentages was used for qualitative variables and they were analyzed using the Pearson Chi square test. A p value of less than 0.05 was considered to be statistically significant.

## RESULTS

The study population consisted of n= 796 patients, out of which n= 654 patients were included in the study as the rest of patients had incomplete data. The mean age of patients was 29 +/- 14 years, of the total study population n= 425 (65%) were females having a mean age of 30 +/- 14 years and n= 229 (35%) were males having a mean age of 34 +/- 16 years. For rest of demographics refer to table 1. The various types of toxicities were distributed as follows, pharmaceutical agents and drugs n= 255 (38.99%), pesticide ingestion n= 276 (42.20%), corrosives n= 26 (3.97%), food n= 52 (7.95%), alcohol n= 32 (4.89%), others n= 13 (1.98%). Of those patients ingesting drugs, the most common agent of choice was analgesic medications, of which 40% used paracetamol, and NSAIDS in 29.80% of the cases, the rest used various other analgesic medications. The most common combination of drugs used were analgesics and antibiotics or analgesics and antidepressants. Organophosphates were used as the most common insecticide and pesticide agent in patients being involved in 94.2% of cases. The most common corrosive agent used was bleach (sodium hypochlorite) in 69.23% of cases and ethyl alcohol was the most common agent used when alcohol was used for intoxication, being the case in 87.5% of patients, while 12.5% of

patients ingested methanol. Majority of the cases of toxicity were due to intentional self harm, refer to graph 1. N= 238 (93.33%) patients took pharmaceutical agents for intentional toxication and n= 17 (6.66%) did accidental overdose, while in the non pharmaceutical group n= 304 (76.19%) patients took intentionally the toxic agents and n= 95 (23.80%) took the agents unintentionally. Of those patients who took the agents for suicide attempt 82% were females as compared to 70% of males having a p value of less than 0.001 respectively. Also the majority of patients who attempted suicide were of young age, less than 28 years old having a p value of less than 0.001, while the majority of patients who in whom the intoxication was intentional were married in 60% of the cases. On initial presentation to the emergency department, n= 458 (70.03%) of the patients had a Glasgow coma score of 15, while n= 59 (9.02%) had a GCS score of 8 and the rest of the patients n=137 had a GCS score between 9 and 14 respectively. The mean time of exposure to arrival at the hospital for the patients was 4 +/- 2.4 hours. The majority of the patients were treated in the ER n= 450 (68.8%) while rest had to be admitted to the hospital. N= 35 (5.35%) of the patients expired. The agents involved were organophosphates in n= 20, pharmaceutical agents in n= 7, methanol in n= 3, cannabis in n=1, foods n=2, and n=2 patients were dead on arrival. The mean length of stay in the hospital for the patients was 25 +/- 10.5 hours. A variety of treatment modalities were available to these patients, and they were treated accordingly by the emergency medicine doctors and staff present. Treatment modalities such as Gastric lavage, activated charcoal, oxygen inhalation, antitoxic and antidote medication, mechanical ventilation etc were used to save the lives of these patients.



**Figure 1: Frequency of intentional and unintentional poisoning**

**Table 1: Various characteristics of the patient population**

Variable	Number of patients n= 654	Percentage
<b>Age group in years</b>		
16 to 25	323	49.38 %
26 to 35	174	26.60 %
36 to 45	86	13.14 %
46 to 60	46	7.03 %
60 and above	25	3.82 %
<b>Gender</b>		
Male	229	35 %
Female	425	65 %
<b>Marital status at admission</b>		
Single	230	35.16 %
Widowed/Divorced	32	4.89 %
Married	392	59.93 %
<b>Number of drugs ingested</b>		
Single drug used	190	74.50 %
Two drugs used	38	14.90 %
Three or more drugs used	12	4.70 %
Not able to identify	15	5.88 %
<b>Class of drugs ingested</b>	249	
Not able to identify	48	19.27 %
Others (homeopathic, herbal etc)	29	11.64 %
Anti ulcer medication	2	0.80 %
Antispasmodic medication	1	0.4 %
Antihistamine medication	4	1.6 %
Antihypertensive medication	5	2.00 %
Antibiotic medication	7	2.81 %
Antiepileptic medication	13	5.22 %
Psychotropic medication	12	4.81 %
Analgesic medication	90	36.14 %
Antidepressant medication	38	15.26 %

## DISCUSSION

Various studies report the number of cases in the emergency department related to acute poisoning to be 0.7 to 2.4% of the total cases, recent study by Hanssens et al report cases to be 0.18% while a study from England reports 1.2% cases.<sup>6,8-14</sup> According to the results of our study the majority of the patients were young age which is similar to other studies<sup>6,7,8</sup> while a study by Reiniluto et al reports highest cases of poisoning in males being of age 28 to 37 years and in females aged 38 to 47 years,<sup>3</sup> the male to female ratio in our study was about 2:1 which is also similar to other studies,<sup>8,9,11</sup> however in the developed countries this ratio is reported to be 1:1.<sup>6,15,16</sup> According to our study we found the rates of intentional suicidal poisonings were greater as compared to accidental poisonings and also more common in the female population which are consistent with other international studies.<sup>5,12,17,18,19,20</sup> The majority of agents used for poisoning were pharmaceutical agents and organophosphates, which is also reported by other similar studies,<sup>5,9,11,12,15,20</sup> and the most common agent used for pharmaceutical poisoning was reported to be analgesic medications which is also similar to our study<sup>8,9,10</sup> whereas according to a study by Baydin et al they found antidepressant medication to be the most abused pharmaceutical agent.<sup>11</sup> In studies conducted in Iran, Finland, Canada and Norway they found Benzodiazepines to be the most abused drug in poisoning cases.<sup>3,5,6,7</sup> In a country like Pakistan where any drug is easily available without a prescription it is fairly easy for patients to acquire any medication they deem fit. The pharmacies are usually run by uneducated or unqualified people, who misguide and misinform the patients when it comes to the use of medications. Paracetamol and mefenemic acid were two most common analgesic agents abused by the patients in our study, which is also the case in other studies conducted in England and Turkey,<sup>8,9,12,14,15,17</sup> in 25% of the cases more than one drug was ingested, and the most common combination being analgesics with antibiotics and with antidepressants which is also in line with other studies.<sup>9,12</sup> Intentional poisoning is one of the common cause of even suicide by the person itself or by somebody else.<sup>21,22</sup> According to a review of 76 articles by Eddlestone they found that organophosphates was responsible for the majority of deaths in cases of poisoning, they are sold openly in Pakistan in every general store and are usually kept in homes for killing various insects etc.<sup>23,24,25</sup> Pakistan is also an agricultural country, and majority of suicide cases occur in illiterate, farmers who consume their own

insecticides and pesticides for poisoning, in countries which are non agricultural the rates of organophosphate poisoning is lower.<sup>9,11,12,17</sup> The other common agent for poisoning used were corrosive agents such as bleach (sodium hypochlorite) which is also widely available and is cheap, is present in virtually all homes and can be ingested intentionally or accidentally, the reports of incidence of corrosive ingestion are from 2 to 2.2% respectively.<sup>2,11</sup> Since Pakistan is a dry country there were not many cases reported for Alcohol intoxication, still in a large metropolitan city like Karachi, buying alcohol is easy, and people also manufacture their own alcohol in small cottage breweries. These locally manufactured alcoholic beverages are poisonous as they contain high quantities of methanol, which is a cause of death in alcohol intoxications. Similarly food related poisonings are also common in this region, where inadequate preparation, sanitary conditions and lack of proper regulation on the food and hotel industry created a public health havoc waiting to happen.<sup>18,19,20,23,25</sup> The majority of the patients reached the hospital within 4 hours, and had a good GCS score on arrival, they were treated appropriately in the emergency department and were discharged. One of the reasons for early discharge was that in our hospital the ICU and CCU were frequently full, and patients who were kept under observation were usually kept in the ER itself. The mortality rate of the patients was 5.35% which is higher than other similar studies which report a mortality rate of 0 to 2.8%<sup>8,9,11</sup> while Eddlestone reports a mortality rate of 0 to 50%.<sup>23</sup> The mortality rate depends on various factors such as amount of drug ingested and its severity, ingestion of non lethal versus lethal agents, time between intake and arrival to the hospital etc.<sup>9,12,23,25</sup> We recommend that strict regulatory measures be taken to stop the easy use and availability of drugs and pesticides, and education programs to inform the public about the use and misuse of drugs and psychological counseling of patients most prone to suicidal attempts.

## CONCLUSION

According to the results of our study, the most common agents of suicide used in our region and those who were reported at our setup were over dose of pharmaceutical agents and pesticide ingestion. Most attempts were to cause deliberate harm to self, and was most common in the younger demographic specially in young girls, it is recommended that preventive measures and

psychological counseling to be done of these patients.

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### AUTHORSHIP AND CONTRIBUTION DECLARATION

AUTHORS	Contribution to The Paper	Signatures
<b>Dr. Abdul Ghani</b> Resident emergency Medicine Ziauddin University Hospital Karachi	Concept, Design, Definition of intellectual content, Literature search	
<b>Muhammad Azam Akhter</b> Resident emergency medicine, Ziauddin University Hospital Karachi	Data acquisition, Manuscript preparation	
<b>Dr. Muhbat Ali</b> Resident emergency medicine, Ziauddin University Hospital Karachi	Write-up, Data collection, Manuscript preparation	
<b>Dr. Shua Nasir</b> Registrar Emergency Medicine Ziauddin University Hospital	Write-up, Data collection, Manuscript preparation	
<b>Dr. Lal Shehbaz</b> Registrar Emergency Medicine Ziauddin University Hospital	Manuscript review, Literature search	
<b>Dr. Zain Ali</b> House officer Civil Hospital, Karachi	Final Layout, Data entry, Write up, Corresponding author	