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Analysis of adult intoxication cases treated in ICU: A sample from Adıyaman Region of Turkey

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Abstract

Objective: We determined the patient profile and aim to look into the distribution of age and sex, intoxication route, the duration of the stay in ICU and prognosis of the cases we accepted to our ICU presenting with intoxication.

Material and Methods: Before the research, approval was granted by the Ethical Committee. 259 intoxication patients, accepted and treated in the ICU of Adıyaman University Hospital between the dates of 2012-2014, were included in the research.

Results: Total of 259 as 83 male, 176 female patients were examined. 75.7% of the cases were below age of 30. 92% of the cases received in ICU were suicidal and 8% of them were accidental intoxication cases. When the causes were observed, 85.7% of the cases were intoxicated by drug intake. Most frequently used drugs were antidepressants (43.6%). The mean number of the days in intensive care unit was 2.02 days.

Conclusion: As a result, most of the intoxication cases in intensive care unit were made up by young age cases who received antidepressants with suicidal intentions. Acute drug intoxications have better response to intensive care treatments and shorter duration of stays while non-pharmacological intoxications have longer duration of stays.

Key words: Adıyaman Region, adult cases, Intensive Care Unit, acute poisoning, suicide

Introduction

Intoxication is the occasion of unwanted signs or symptoms in the organism caused by a toxic substance or a non-toxic substance received at a toxic dose (1). Intoxications can emerge as intake of drug or substance with an aim of suicide, unintentional usage of overdose medication or uncalled drug reactions (2,3). Intoxication cases constitute about 5-14% of the patients in intensive care unit (4). In Turkey, it is stated that the percentage of the intoxication cases in all the cases rushed to the emergency service is 0.91% and the percentage of intoxication cases is 5.11% in all the cases treated in intensive care unit (3).

Besides emergency treatment, in intoxication cases, preventing absorption of toxic substance by the gastrointestinal system, accelerating the excretion, giving specific antidote, offering supportive care, emergent dialysis under certain conditions can be applied among the main treatment principles (5).

We aim to look into the distribution of age and sex, the way of intoxication and its type, the duration of the stay in intensive care and prognosis of the cases we accepted to our intensive care unit presenting with intoxication.

Material and Methods

Before the research, approval was granted by the Ethical Committee of Adıyaman University Training and Research Hospital non-invasive Clinical Research (28/04/2015-0316). 259 patients, treated for the reason of intoxication in the intensive care unit of Adıyaman University Training and Research Hospital between the dates of 2012-2014, were included in the research. Demographical data and clinical features of the cases were determined by scanning file records.

The cases were evaluated under the titles of demographical data, intoxication type (Suicide, accident), agents exposed, duration of intensive care, drug intake, and discharge type from the intensive care unit and mortality.

Statistic: The collected data were installed and evaluated by computer program SPSS 15.0 (Statistical Package for Social Science).

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The descriptive statistics for the continuous variable in the research were stated as: mean, standard deviation, minimum and maximum values, and categorical variables were stated as numbers and percentage. For the comparison of two independent group, Independent T-Test was used and $p<0.05$ value was statistically found meaningful.

Results

259 patients, followed and treated for the reason of intoxication in the intensive care unit of Adıyaman University Training and Research Hospital between the dates of January 2012- December 2014, were observed. 83 (32%) of the cases were male and 176 (68%) of them were female. The mean age of the cases was 25.72. The youngest age was 15 and the oldest age was determined as 81 (Table 1).

The cases were studied in five categories according to the age groups, which were: 15-20, 21-30, 31-40, 41-50 and above. In intoxication, when looked into all age groups, it was determined that females were 68% and males were 32% ($p<0.05$). 75.7% (n: 196) of the cases were below the age of 30. Considering the intoxication taking place under the age of 30 the percentage of the females was meaningfully higher than the males ($p<0.05$). Furthermore, the intoxications cases after the age of 50 the rates of the males were found as 57% (Table 2).

92% of the cases received in ICU were suicidal and 8% of them were accidental intoxication cases ($p<0.05$). The rate of suicidal intoxication cases were identified 94% for females and 87% for males ($p>0.05$) (Table 2).

When the causes of intoxication cases were observed, it was seen that 85.7% (n: 222) of the cases were intoxicated by drug intake and 14.3% (n: 37) of them were intoxicated by non-pharmacological reasons. 74.8% of drug intake cases were single drug intake while 25.2% were multiple drug intakes. The mean number of the days in intensive care unit was 2.02. Duration of the stay in ICU was determined as 1.84 days for single drug intake cases, 1.91 days for multiple drug intake cases and 3.0 days for the cases of non-pharmacological intoxications ($p<0.05$). The longest duration of stay in ICU occurred in alcohol, pesticides and organophosphate intoxications (Table 3) (Figure 1).

In the cases intoxicated by drug intake, it was seen that the most frequently used drugs were antidepressants (43.6%), the second most frequently used drugs were analgesic anti-inflammatory drugs (17%). In non-pharmacological intoxications organophosphates (7%) were stated to be the most frequent cause (Table 4).

In our research, mortality was defined as 0.38%. While 63.7% of the cases were discharged, 34.7% of them were transferred to the service (Table 5).

Table 1: The data regarding the demographical features and the number of the days in intensive care unit.

Sex	N	Age (year) (Mean±SD)	Number of the days In ICU (day)
Male	83 (32%)	28.67±12.98	2.41±2.47
Female	176 (68%)	24.23±9.12	1.84±0.99
Total	**259**	**25.72±10.78**	**2.02±0.63**
p		0.01	0.008

SD: Standart deviation ICU: Intensive Care Unit

Table 2: The distribution of age groups by the sex

Intoxication Type	N	F/M	Male	F/M (%)
Suicide	238 (92%)	166 (94%)*	72 (87%)	70/30
Accident	21 (8%)	10 (6%)	11 (13%)	48/52
Age Groups (year)				
15-20	110 (42.5%)	79	31*	72/28
21-30	86 (33.2%)	62	24*	72/28
31-40	37 (14.3%)	21	16	57/43
41-50	19 (7.3%)	10	9	53/47
50+	7 (2.7%)	3	4	43/57
Total	259 (100%)	176	83	68/32

(*) shows the values lower than $p<0.05$.

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Table 3: The causes of intoxications and the number of the days in ICU

The causes of intoxications	Number (%)	Duration of stay in ICU (day)
Single Drug	166 (64%)	1.84
Multiple Drug	56 (22%)	1.91
Non-Pharmacological	37 (14%)	3.0
Total	**259 (100%)**	**2.02**
p	0.001	

Table 4: The chart of the intoxications reasons

	Drug Name	Number	Percent (%)
Drug	Antidepressant	113	43.6
	Analgesic-anti-inflammatory	44	17
	Antihypertensive	9	3.7
	Antibiotics	8	3
	Other Drugs	23	8.8
	Unknown	25	9.6
	Total	**222**	**85.7%**
Non-pharmacological Causes	Organophosphates	18	6.9
	Alcohol	3	1.2
	Bleach	3	1.2
	Pesticides	6	2.3
	Fungi	3	1.2
	Other	4	1.5
	Total	**37**	**14.3%**

Table 5: The data regarding the relation of intoxication causes and sex with prognosis

	N	Discharged	Transfer to Service	Death	Transfer to an Advanced Centre
Male	83	49 (59%)	32 (38.6%)	1 (1.2%)	1 (1.2%)
Female	176	116 (65.9%)	58 (33%)	-	2 (1.1%)
Suicide	238	151 (63.4%)	84 (35.3%)	1 (0.4%)	2 (0.8%)
Accident	21	14 (66.7%)	6 (28.6%)		1 (4.8%)
Total	**259**	**165 (63.7%)**	**90 (34.7%)**	**1 (0.4%)**	**3 (1.2%)**
p			>0,05		

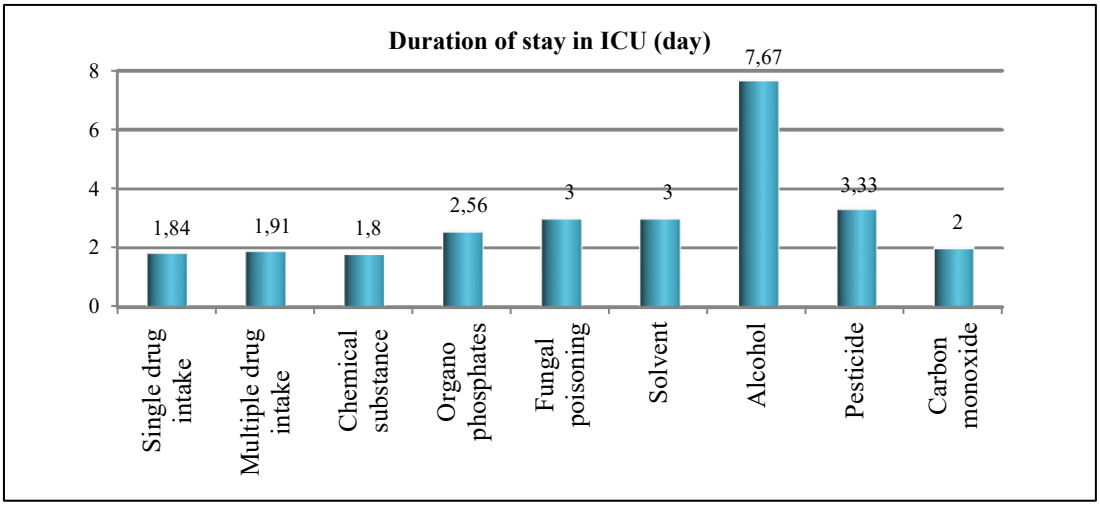

Figure 1: The graphic of the relation between the cause of intoxication and the duration of stay in ICU.

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Discussion

Intoxication is defining a chemical substance's potential of harming the body. In our age the rate of the intoxication cases around the world is increasing day by day due to the changing life style and social behaviours. 5-30% of intensive care unit beds are occupied by intoxication cases (5,6). In acute intoxication cases by evaluating the patient's clinic and laboratory symptoms, and the causes of intoxication, the cases with life threatening situations are accepted to the ICU, followed and treated.

The cause of intoxication varies according to the geographic conditions, age, sex, education level, traditions of the region and seasons (7). Research studies state that intoxication cases are more common among young female population.

A study in Turkey (8), it was reported that 0.64% of the patients presented in emergency service were acute intoxication cases. It was also identified that the mean age of all the cases was 28.16±11.74, and 68.6% of them were female. 84.9% of these intoxications were suicidal and 15.1% of them were accidental exposure. In our study, 68% of the cases were female and 32% of them were male. The mean age of all the cases was 25.72±10.78.

75.7% of the cases were the patients under the age of 30 in our study. It was notified that the rate of the female intoxications was meaningfully higher in comparison with the males regarding the intoxications under the age of 30 while the rates were similar concerning the intoxications above the age of 30.

In our study 92% of the intoxication cases received at ICU, were for suicidal reasons and 8% of them were accidental exposure. In the study held by Demirel et al. (9) female/male rate in 457 acute intoxication cases, treated in intensive care unit, was found 2.46. 92.2% of these intoxications were because of suicidal reasons and 7.8% of them were accidental exposure cases, and similar results were gathered in our research. Abdollahi et al. (2) reported that accidental exposure in children and suicidal intoxication in women was more common. We consider that the high rates of female suicidal intoxications under the age of 30 are due to the fact that they are more emotional.

Technological and socio-economic improvements make drug and chemical substance access much easier (10). According to the information provided by Ministry of Health in Turkey, the most frequent acute intoxication factors are respectively, drugs (analgesic, antidepressant, antihistaminic etc.), agricultural pesticide and insecticide (organophosphates etc.), domestic chemicals (bleach, detergents etc.), toxic gases (carbon monoxide, choking gases), other chemicals, plants and nutrition (fungi, saloon plants, fish, andromedotoxine, apricot seed, etc.) and venomous animal bites and stings (scorpion, snake, spider, bee etc.) (11).

Demirel et al. (9) as drugs are defined as the most frequent cause of intoxications; it was stated that 28.6 of the cases received more than one drug and the drugs taken by 6.56% of the cases were unidentified. It is stated that antidepressants (23.8%) are known as the most common cause of intoxications and they are followed by analgesic-anti-inflammatory (18.1%) and antihistaminic (7%) in intoxication cases. Mortality rate in the research was calculated as 0.21%. In the research of Ayan et al. (12) the rate of intoxications was found as: 47% drug, 22% carbon monoxide and 8.3% agricultural pesticide. When literature is reviewed it comes out that the most important cause of intoxications are drugs (5,13). In our research it was also seen that 222 (85.7%) of the cases were intoxicated by single or multiple drug intake and 37 (14.3%) of the cases were intoxicated by exposition to non-pharmacological factors. In 9.6% of drug intake cases, the drugs received were unidentified. Besides, Ergun et al. (8) reported that out of 1380 acute drug intoxication 48.1% of them occurred by psychoactive drugs (n:664), and 33.5% of them were analgesic (n: 463). Mortality rate in the research was calculated as 0.58%. Considering the most common reason of intoxications is suicidal, we think that easy access to drugs allows abusing and for this reason it becomes the most frequent factor for intoxications.

The patients having depression treatment have higher suicide attempt and it is determined that these patients attempt to commit suicide with their own medication. The research upon this matter indicated that 50% of the cases attempting suicide were the patients with earlier history of psychiatric problems (14,15). In our study the rate of intoxication with an antidepressant is 43.6%. The second frequent cause becomes analgesic-anti-inflammatory (17%) drugs. The most common non-pharmacological intoxication is due to organophosphates (6.9%).

In our study the mean duration of stay in ICU was 2.02 days. The length of stay in intensive care unit was found 3.5 days by Kurt et al. (16) and by Yagan et al. (1) the duration was found 3.77 days and by Ersoy et al. (17) the duration was found 3 days. The duration of stay was calculated lower compared to the literature. Besides, it was determined that for single drug intake cases mean duration of stay was 1.84 days, for multiple drug intake cases the mean was 1.91 days and for non-pharmacological intoxication cases mean stay was 3 days. In acute drug intoxications, early diagnosed good treatment response is seen with symptomatic treatments like stomach lavage that decrease absorption and increase excretion, and there are opportunities of specific antidotes.

For this reason the duration of stay in our research was short. In non-pharmacological intoxication cases the mean length of stay in intensive care was found meaningfully longer. And the longest stay in ICU was in alcohol intoxications.

It was notified in the studies that mortality rate in intoxications varied between %0.03-27 (18,19). Mortality rate of our research was found as 0.38%. The only case progressing mortal was acute alcohol intoxication. We related the reason of low mortality rate to the high rate of drug intoxication and new antidepressants being less toxic.

Conclusion

As a result, most of the intoxication cases in intensive care unit were made up by young age female cases who received antidepressants with suicidal intentions. Acute drug intoxications have better response to intensive care treatments and shorter duration of stays while non-pharmacological intoxications have longer duration of stays. By the reason of easy access to drugs, we consider that they are open to abuse and some precautions are needed to be taken.

Conflict of Interest: The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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