

# The Evaluation of Blood Glucose and pH Levels on The Patients Who Attempt Suicide With Drug Overdose

İlker AKBAŞ<sup>1</sup>, Sultan Tuna Akgöl GÜR<sup>2</sup>, Abdullah Osman KOÇAK<sup>2</sup>

<sup>1</sup> Department of Emergency Medicine, Bingöl State Hospital, Bingöl, Turkey

<sup>2</sup> Department of Emergency Medicine, School of Medicine, Atatürk University, Erzurum, Turkey

## Abstract

**Objectives:** Throughout the history of humanity, suicides in all societies are not only a matter of concern to the psychiatrists, but also have economic, cultural and social aspects. The World Health Organization divides the suicides into completed suicides and suicide attempts and determines that the completed suicides result in deaths. Suicide attempts are all non-lethal voluntary attempts to destroy, harm, and poison oneself.

**Materials and Methods:** Our study was done retrospectively in the emergency department of Faculty Hospital at Atatürk University. The files of the intoxication patients who applied to our hospital between 01.01.2010 and 31.12.2011 were examined. The patients who applied to our hospital after taking pills for suicidal reasons were included in the study. In addition to demographic data such as age, gender, marital status, these patients were classified according to the drugs they took like psychiatric drugs (antidepressant, anxiolytic) and analgesic (paracetamol, NSAID) and antibiotic drugs. Psychiatric diagnose, Glasgow coma score, blood pH at the time of presentation, glucose and hospitalization time(less than 1 day, more than 1 day) were registered.

**Results:** From the file scan, the data of a sum of 234 patients was reached. 69.7% (n = 163) of the patients were female. The mean age of the patients was 24.64 (± 9.463). According to marital status, 75 (32.1%) of the patients were married, 150 (64.1%) were single, 5 were widow (2.1%) and 4 (n = 1.7) patients were engaged. According to the drugs they used for suicide, there were 72 (30.8%) patients who used psychiatric drugs and 83 (35.5) patients who used analgesics and antibiotics. The number of patients that were hospitalized above 24 hours was 38 (16.2%). In the statistical analysis, there was no significant difference between GCS, pH and Glucose values of the patients who committed suicide with Psychiatric and Antibiotic-Analgesic drugs (p>0.05). Similarly, there was also no significant difference between hospitalization times (p>0.05).

**Conclusion:** As a result of our study, it was found that the patients that committed and attempted suicide were under 30 years old and mostly women. Considering the drugs used for suicidal purposes, no difference could be detected between the use of analgesic-antibiotics and psychiatric medication on blood parameters and GCS.

**Keywords:** suicide attempts, drug overdose, glucose, ph, blood analyzes

## Özet

**Giriş:** İnsanlık tarihi boyunca bütün toplumlarda her zaman görülen intihar sadece ruh hekimlerini ilgilendiren bir sorun olmayıp ekonomik, kültürel ve toplumsal yönleri vardır. Dünya Sağlık Örgütü, intiharları gerçek intiharlar ve intihar girişimleri olarak ikiye ayırarak gerçek intiharları ölümlü sonuçlananlar olarak belirlemektedir. İntihar girişimleri ise bireyin kendisini yok etmek, zarar vermek, zehirlemek amacıyla gerçekleştirildiği intihara yönelik, ölümcül olmayan tüm istemli girişimlerdir.

**Gereç-yöntem:** Çalışmamız Atatürk Üniversitesi Tıp Fakültesi hastanesi Acil servisinde retrospektif olarak yapılmıştır. Çalışmamız için 01.01.2010-31.12.2011 tarihleri arasında hastanemize başvuran intoksikasyon hastalarına ait dosyalar incelenmiştir. Çalışmamız içinde belirlenen tarih aralığında hastanemize ilaç içme sonrası başvuran hastalar dahil edilmiştir. Bu hastaların yaş, cinsiyet, medeni durum gibi demografik verilerine ek olarak aldığı ilaçlarda psikiyatrik ilaçlar(antidepresan, anksiyolitik) ve analjezik(parasetamol, NSAİD) ve antibiyotik ilaçlar olarak gruplandırılmıştır. Hastanede yattığı süre içerisinde psikiyatri konsültasyonu sonrası aldığı psikiyatrik tanı, Glasgow koma skoru, başvuru anı kan ph, glikoz ve hastanede kalış süresi (1 günden az, 1 günden çok olmak üzere) kayıt altına alınmıştır.

**Bulgular:** Dosya taramasından toplam 234 hasta verisine ulaşıldı. Hastaların %69,7'si (n=163) kadın cinsiyette idi. Hastaların yaş ortalaması 24,64 (±9,463). Medeni durumlarına göre hastaların 75 tanesi (%32,1) evli, 150 tanesi (%64,1) bekar, 5 kişi dul (%2,1) ve 4 (n=1,7) hasta ise nişanlı idi. Hastaların intihar amaçlı kullandıkları ilaçlara göre psikiyatrik ilaç kullanan 72 (%30,8), analjezik ve antibiyotik kullanan 83 (35,5) hasta vardı. Hastalardan 24 saat üzerinde hastanede yatan hasta sayısı 38 (%16,2) idi. Yapılan istatistiksel analizde psikiyatrik ve Antibiyotik-Analjezik ilaçlar ile intihar eden hastaların GKS, PH ve Glikoz değerleri arasında anlamlı fark yoktu. (p>0,05) aynı şekilde aldıkları ilaç çeşidine (psikiyatrik, analjezik-antibiyotik) göre hastanede yatma süreleri arasında da anlamlı fark yoktu(p>0,05).

**Tartışma:** Çalışmamızın sonucunda intihar ve intihar girişimi olan hastalarda; kadınların çoğunlukta olduğu ve hastalarımızın çoğunun 30 yaşın altında olduğu bulundu. İntihar amaçlı kullanılan ilaçlar göz önüne alındığında analjezik-antibiyotik ile psikiyatrik ilaç alınmasının, kan parametreleri ve GKS üzerinde bir fark tespit edilememiştir.

**Anahtar Kelimeler:** intihar girişimi, ilaç overdoz, glukoz, ph, kan analizi

## Introduction

Throughout the history of humanity, suicides in all societies are not only a matter of concern to the psychiatrists, but also have economic, cultural and social aspects<sup>1,2</sup>. The

World Health Organization divides the suicides into completed suicides and suicide attempts and determines that the completed suicides result in deaths. Suicide attempts are all non-lethal voluntary attempts to destroy, harm, and poison oneself<sup>2</sup>. Many psychosocial risk factors are considered to

**Corresponding Author:** Sultan Tuna Akgöl Gür e-mail: sultantuna@hotmail.com

**Received:** 12.01.2018 • **Accepted:** 15.02.2019

©Copyright 2018 by Emergency Physicians Association of Turkey - Available online at www.ejtoxicology.com

contribute to the suicide risk. Suicide risk also increases in situations such as marriage problems, unemployment, low socioeconomic status, living alone, migration history, stressful life, death of a relative, job loss and detention<sup>3,4</sup>. Drug intoxication is one of the reasons for admission to emergency services. Drug intoxications often occur as a result of accidental ingestion in children and suicide in adults. Although it is one of the common problems encountered in emergency services in our country, it is very difficult to reach a reliable morbidity and mortality statistics<sup>5</sup>.

Toxicology is divided into three main sub-branches as industry, economic and forensic toxicology. Industrial toxicology examines the harmful effects of chemical pollutants in air and water, and also discusses the existing pollutants at the work and home. Economic toxicology examines chemicals in drugs, food additives, cosmetics, fertilizers and veterinary drugs. Forensic toxicology, in particular, investigates the medical aspect of cases that result in death or serious injury. Drugs are used for healing, while poisons are used for killing. However, if an overdose is the case, this generally means that the drug is used as poison. Suicide is the most common form of death due to intoxication. Cyanide, arsenic and other toxic substances are common, but the cause of suicides is most commonly prescribed drugs. People who have psychiatric disorders can easily access drugs that can be lethal when taken in large amounts to deal with the symptoms of these diseases<sup>6</sup>.

In our study, the patients who had taken high doses of drugs used for medical purposes and received inpatient treatment in our hospital afterwards, were examined. Changes in blood biochemistry and Glasgow coma scores were examined according to the medications taken by the patients.

## Materials and Methods

Our study was done retrospectively in the emergency department of Medical Faculty Hospital at Atatürk University. The files of the intoxication patients who applied to our hospital between 01.01.2010 and 31.12.2011 were examined. The hospital in which our study is performed is a central hospital providing third step health services in eastern Anatolia. The patients who were admitted to our hospital after taking drugs for suicidal reasons at aforementioned date range were included in this study. In addition to demographic data such as age, gender, marital status, these patients' drugs were classified according to the drugs like psychiatric drugs (antidepressant, anxiolytic) and analgesic (paracetamol, NSAID) and antibiotic drugs. During their stay in the hospital, psychiatric diagnosis after psychiatric consultation, Glasgow coma score, blood pH at admission time, glucose and hospital stay time (less than 1 day, more than 1 day) were registered.

Descriptive statistics were reported as proportions for categorical data and as mean  $\pm$  standard deviation for continuous numeric variables. We performed a series of uni-

variate analyses using the independent t test for numeric variables and the Chi-square test for categorical variables. In defining independent variables, we accepted  $p < 0.05$  in univariate analyses as the numbers in each groups were sufficient. The statistical analysis was performed using SPSS software (released 2011; IBM SPSS Statistics for Windows, Version 20.0, IBM Corp., Armonk, NY).

## Results

From the file scan, the data of a sum of 234 patients was reached. 69.7% (n = 163) of the patients were female. The ages of the patients ranged from 14 to 88 and the mean was 24, 64 ( $\pm$  9,463). According to the marital status, 75 (32.1%) of the patients were married, 150 (64.1%) were single, 5 were widowed (2.1%) and 4 (n = 1.7) patients were engaged. According to the drugs they used for suicide, there were 72 (30.8%) patients who used psychiatric drugs and 83 (35.5) patients who were using analgesics and antibiotics. The classification of the patients according to their diagnosis after psychiatric consultation is summarized in Table-1.

The number of patients that were hospitalized above 24 hours was 38 (16.2%). Their classification according to Glasgow coma score and blood parameters of patients are shown in Table-2.

**Table 1.** Classification of the patients according to their diagnosis after psychiatric consultation

	Number (n)	Percentage (%)
No psychiatric diagnosis	143	31,1
Impulsive Suicide	67	28,6
Major depressive disorder	20	8,5
Obsessive compulsive disorder	2	0,9
Bipolar	1	0,4
Psychosis	1	0,4
Total	234	100

In the statistical analysis, there was no significant difference between GCS, PH and Glucose values of the patients who committed suicide with Psychiatric and Antibiotic-An-

**Table 2.** Classification of patients according to blood parameters and Glasgow coma score

	N	Minimum	Maximum	Mean	Standard deviation
GCS	234	3	15	14,18	2,559
PH	195	6,85	7,62	7,39	0,077
Glucose	219	67,7	442	110,67	41,40

algesic drugs ( $p > 0.05$ ). Similarly, there was no significant difference between hospitalization times according to the type of medicine they took ( $p > 0.05$ ).

## Discussion

The cause of suicide varies from one individual to another. Generally, there is a motive of frightening their relatives, punishment, anger or a need escape for intense shame.

Crisis situations involving parasuicide risks are closely related to negative and stressful life events. Volant stated that the feeling of exhaustion and depressions that lead to the suicidal tendencies were observed in women. According to Volant, poverty and low education level as well as their inability to integrate with the society have a significant impact on the emergence of women's depression<sup>7</sup>. The suicide rate for men is more than women in all regions in Turkey. It is seen that female suicides are more than male suicides in South East Anatolia Region<sup>8</sup>. Şenol and his friends found female / male ratio as 1/7 in their studies in Kayseri<sup>9</sup>. In a study by Ambade and his friends, the rate of deaths from suicide was found to be 62.5% for men, 37.5% for women and 1.7: 1 for ratio<sup>10</sup>. Women's suicide rate in China is 25% higher than in men<sup>11</sup>. This situation is similar in our study.

Suicide prevalence is the highest in the males over 45 years of age. After the age of 55, it was observed that the number of completed suicides had increased. The number of suicide attempts in older men is low, but the rate of completed suicide is high. Suicide attempts are common in the patients with psychiatric disorders. They are observed between the ages of 20 and 40 in the patients with mood disorders. They are seen in all ages between childhood (5-6 years) to 50 years of age (rarely older) in bipolar patients<sup>12, 14</sup>. In major depression, suicide is more common in all ages, but is usually more common in those who are 30 to 40 years<sup>15</sup>. The suicides in Turkey show a density of ages 15-24 and ages 25-34. While the women of 15-24 years old and younger than 15 years old have a higher rate, males have higher rate in other age group<sup>8</sup>. This situation is similar in our study.

In the United States, the rate of suicide in the married is 11/100000, while the rate of unmarried people is almost twice as much. Being a man raises rates here. The proportion of suicide in the divorced men is 69/100000, whereas it is 18/100000 in the divorced women, which is lower. The majority of individuals who attempt suicide in Europe are single, widowed or alone<sup>16</sup>. In a study, the rate of divorced or separated people is 11 times higher than those without risk<sup>17</sup>. Divorce rates are less common in the eastern part of our country than the western part. The highest suicide rate in our country is seen in the Aegean region<sup>18</sup>. In our study, the majority of those who attempted suicide are single.

In our study, our patients who attempted suicide with medications used for psychiatric purposes consist of ap-

proximately 30%. This situation is an indication of the use of these drugs by the patients themselves or someone from their family. After all, the people with psychiatric disorder or who have someone with one are more prone to suicide. Among the patients, 35% of the drugs used for suicide were analgesics and antibiotics.

This ratio was also expected to be high. Analgesic and antibiotic groups are the most commonly used drugs in households. In our study, we investigated the effect of psychiatric medication and analgesics-antibiotics on the blood parameters of patients. GCS score was also evaluated. As a result of this study, no difference was found between these drugs.

## Conclusion

As a result of our study, it was found that patients that committed and attempted suicide were mostly women and under 30 years old. Considering the drugs used for suicidal purposes, no difference could be detected between the use of analgesic-antibiotics and psychiatric medication on blood parameters and GCS.

## References

1. Bekaroğlu M. Birinci Basamak için Acil Psikiyatri. İstanbul: Uniform Matbaası; 1998.
2. Köknel Ö. Genel ve Klinik Psikiyatri. İstanbul: Nobel Tıp Kitabevi; 1989.
3. Stack S. Suicide: a 15-year review of the sociological literature. Part II: modernization and social integration perspectives. *Suicide Life Threat Behav.* 2000;30(2):163-76.
4. Heikkinen M, Aro H, Lonqvist J. Recent life events, social support and suicide. *Acta Psychiatr Scand Suppl.* 1994;377:65-72.
5. Seydaoğlu G. Zehirlenme Epidemiyolojisi. Doç Dr Salim Satar, Editör; Nobel Kitapevi 2004.
6. Poklins A. Forensic Toxicology. In: Eckert WG. Introduction to Forensic Sciences. 2nd ed. Florida: CRC;1997
7. Volant E. İntiharlar Sözlüğü, Çev: Turhan Ilgaz, Sel Yayıncılık, İstanbul, 2005
8. Uçan Ö. Türkiye'de intiharı konu alan yayınlar üzerine bir bibliyografya çalışması. *Kriz Dergisi.* 2005;13(3):15-26.
9. Senol V, Ünal D, Avsarogullari L, İkizceli I. İntihar girişimi nedeniyle Erciyes Üniversitesi Tıp Fakültesi Acil Anabilim Dalı'na basvuran olguların incelenmesi\*/An analysis of patients admitted to the Emergency Department of Erciyes University Medical School due to suicidal attempt. *Anadolu Psikiyatri Dergisi.* 2005;6(1):19.
10. Ambade VN, Godbole HV, Kukde HG. Suicidal and homicidal deaths: a comparative and circumstantial approach. *Journal of forensic and legal medicine.* 2007;14(5):253-60.
11. Practice guideline for the assessment and treatment of patients with suicidal behaviors. *Am J Psychiatry.* 2003;160(11 Suppl):1-60.

12. Aslan Ş, Emet M, Cakir Z, Aköz A, Gür STA. Suicide attempts with amitriptyline in adults: a prospective, demographic, clinical study. *Turkish Journal of Medical Sciences*. 2011;41(2):243-9.
13. Depp CA, Jeste DV. Bipolar disorder in older adults: a critical review. *Bipolar disorders*. 2004;6(5):343-67.
14. Leboyer M, Henry C, Paillere-Martinot ML, Bellivier F. Age at onset in bipolar affective disorders: a review. *Bipolar Disorders*. 2005;7(2):111-8.
15. Kaplan HI, Sadock BJ. *Kaplan and Sadock's Synopsis of Psychiatry*. (9th ed). Williams and Wilkins, Philadelphia 2003, pp 534-536.
16. Yalvaç D. İntihar Girişiminde Bulunan Bireylerde Psikiyatrik Morbidite, Kişilik Bozukluğu ve Bazı Sosyo-Demografik ve Klinik Etmenlerle İlişkisi. Uzmanlık Tezi Malatya, İnönü Üniversitesi, Tıp Fakültesi. 2006.
17. Skegg K. Self-harm. *The Lancet*. 2005;366(9495):1471-83.
18. Başbakanlık Devlet İstatistik Enstitüsü İntihar İstatistikleri. Ankara: Devlet İstatistik Enstitüsü Matbaası; 1998.