



# EURASIAN JOURNAL of CRITICAL CARE



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# Editorial

Ülkemiz 2020 yılına zaten devam etmekte olan trafik kazaları ve terör gibi sıkıntılara ilaveten deprem, çığ ve uçak kazası gibi felaketler ile başladı. Tüm dünya ise yaklaşık bir asırdır benzerine rastlamadığı bir virüs salgını ile şok yaşıyor.

Hastanelerin pandemi hastanesi ilanı, elektif ameliyatların ertelenmesi, bilim kurulu oluşturulması, filyasyon, tüm sağlık çalışanlarının seferber olması gibi tıbbi tedbirlerin yanı sıra sosyal, ekonomik, kültürel, sportif vb. birçok alanda alınan tedbir ve yaklaşımlarla bu pandemi süreci örnek teşkil edecek şekilde yönetilmekte.

Özellikle son iki aydır ülkemizin de etkilendiği Koronavirüs pandemisi nedeniyle yoğun bakım ünitelerimiz, acil servislerimiz bambaşka bir hasta grubunu misafir etmekte.

Bu olağanüstü şartlarda bile işlevini aralıksız sürdüren alanlardan birisi de kuşkusuz bilimsel çalışmalar. Kritik Bakım Dergimiz 4. sayısında hız kesmeden travmadan toksikolojiye, kardiyovasküler problemlerden solunumsal acillere birçok alanda yeni araştırma çalışmalarına ilaveten ilgi çekici olgu sunumlarına yer verdi.

Önümüzdeki günlerin tüm dünyada salgının sona erdiği, normal hayata dönüşün müjdelendiği dönem olması dileğiyle bu sayımızda emeği geçen tüm yazar, hakem ve dergi kuruluna teşekkürlerimi borç bilirim, sağlıklılıkla kalınız.

Tüm editöriyal kurul adına editör;  
Prof. Dr. Mehmet Gül

Our country started 2020 with disasters such as earthquakes, avalanches and plane crashes in addition to the traffic accidents and terrorism that are already ongoing. The whole world is shocked by a virus outbreak that it has not encountered for about a century.

In addition to medical measures such as the announcement of pandemic hospitals of hospitals, postponement of elective surgeries, establishment of a scientific board, filiation, mobilization of all healthcare workers, social, economic, cultural, sports, etc. This pandemic process is managed as an example with the measures and approaches taken in many areas.

Our intensive care units and emergency rooms host a completely different group of patients, especially due to the coronavirus pandemic, which has been affected by our country for the last two months.

Scientific studies are undoubtedly one of the areas that continue to function even under these extraordinary conditions. In the 4th issue of our Eurasian Journal of Critical Care, it included interesting case reports in addition to new research studies in many areas from trauma to trauma to toxicology, cardiovascular problems and respiratory emergencies.

I would like to thank all the authors, referees, and magazines who contributed to this issue, and hope that this will be the period in which the epidemic ends in the world and the return to normal life is heralded.

Tüm editöriyal kurul adına editör;  
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# Predictors of Early And Late Mortality in Multitrauma Patients

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## Abstract

Trauma-related deaths are the third most common cause of death in all age groups, following cardiovascular diseases and cancer. Predicting mortality and morbidity is of vital importance for patient survival while evaluating trauma patients with a multidisciplinary approach, who account for a significant number of emergency admissions. This study aimed to investigate the parameters that may affect early (24 hours) mortality due to multitrauma. The mean RTS of the early deaths (n: 49) was  $3.11 \pm 2.19$  and that of the late deaths was  $5.32 \pm 1.78$ ; the ratio was statistically significant ( $p < 0.0001$ ). The mean ISS of the early deaths (n: 49) was  $59 \pm 17.85$  and that of the late deaths was  $36.16 \pm 12.43$ ; the ratio was statistically significant ( $p < 0.0001$ ). The mean admission APACHE II score of the early deaths was  $27.22 \pm 6.78$  years; the ratio was statistically significant ( $p < 0.0001$ ). The mean lactate values were  $6.63 \pm 3.43$  for the early deaths and  $3.98 \pm 2.87$  for the late deaths in late deceased patients and the difference was statistically significant. The mean base deficit (BD) of the early deaths was  $11.5 \pm 7.06$  and that of the late deaths was  $-5.10 \pm 7.15$ , thereby leading to a statistically significant difference ( $p < 0.0001$ ). In conclusion, the GCS score, RTS, ISS, and APACHE II score are reliable to use for mortality prediction and high lactate and BD levels can also be used in early mortality prediction. We believe that aggressive treatment may make a positive contribution to survival in patients with high lactate and BD values.

**Keywords:** Predictors, Mortality

## Introduction

Multitrauma refers to structural damage to multiple body areas or organ systems after physical external factors. Trauma is one of the most common causes of death in people under the age of 40 and causes more than 10,000 deaths per day worldwide<sup>1</sup>. Scoring systems have been developed to predict mortality and morbidity while evaluating trauma patients with a multidisciplinary approach, who account for a significant number of emergency admissions. Scoring systems are used as a follow-up parameter to evaluate the severity of injury and its response to treatment.

Serum lactate measures products of anaerobic metabolism and shows impaired oxygenation of tissues in shock patients<sup>2</sup>. Base excess (BE) is calculated to determine the amount of strong acid or base required to balance the pH of the blood at 7.4<sup>3</sup>. BE is known to be influenced by lactic acidosis, ventilation rate, sodium bicarbonate, intravenous fluid and blood transfusion<sup>4</sup>. BE and serum lactate level are used in the post-trauma follow-up of patients. BE and serum lactate level have been reported to be associated with poor prognosis and post-trauma follow-up of patients<sup>5</sup>.

This study aimed to investigate the parameters that may affect early (<24 hours) and late (>24 hours) mortality due to multitrauma.

## Materials and Methods

This study retrospectively investigated multitrauma cases followed up in the emergency department of the University of Health Sciences Haydarpaşa Numune Training and Research Center. All patients who survived the trauma and were discharged after the examination and treatment and patients with high levels of alcohol in their blood were excluded from the study.

The patients were divided into two groups: early (<24 hours) and late (>24 hours) mortality. Age, sex, mechanism of trauma, Glasgow Coma Scale (GCS) score on admission, Revised Trauma Score (RTS), Injury Severity Score (ISS), post-traumatic death time, organ damage and bone fractures after multiple trauma, blood pressure, pulse, hemoglobin, hematocrit, lactate and base excess values at the time of application were recorded.

Statistical analysis was performed using SPSS software Version 16.0. Continuous variables were analyzed using the Kolmogorov-Smirnov test. The Mann-Whitney U test was used to compare differences between groups and the Chi-square test was used to analyze categorical variables. A p-value less than 0.05 was considered statistically significant.

## Results

This study recruited 110 patients who were examined in our emergency clinic due to multitrauma and died during the follow-up. Among 110 patients, 85 (77.3%) were male and 25 (22.7%) were female. 49 (44.5%) patients died in the early period and 61 (55.4%) died in the late period. There was no statistically significant difference between sex and early and late mortality ( $p > 0.05$ ).

The mean age was  $44.57 \pm 21.93$  years. The minimum age was 4 years and the maximum age was 91 years. With respect to trauma etiologies, the most common etiology was out-of-vehicle traffic accidents (39.1%). The other mechanisms of trauma were as follows: 26.4% falls from height, 12.7% in-vehicle traffic accidents, 9.1% motorcycle accidents, and 12.7% other causes. When the association between the mechanisms of trauma and the rate of early and late mortality was analyzed, a statistically significant correlation was found between falls from height and late mortality ( $p < 0.05$ ).

22 (31.9%) of the patients with head trauma died within the first 24 hours and 47 (68.1%) died after 24 hours ( $p < 0.05$ ). Of head trauma patients with an Abbreviated Injury Scale (AIS) score  $> 3$ , 23 patients (34.8%) died in the early period and 43 patients (65.2%) died in the late period, thereby yielding a significant correlation between early and late mortality ( $p < 0.05$ ). 23 patients (82.1%) with abdominal AIS score  $> 3$  died within the first 24 hours and there was a significant correlation between early and late mortality ( $p < 0.05$ ). Pelvic, femoral or extremity fractures, vascular-nerve injuries, vertebral fractures, and maxillofacial injuries did not lead to statistically significant differences between the early and late mortality groups.

Considering the trauma scores of the patients on admission, there was a statistically significant difference between the mean GCS score ( $5.12 \pm 1.89$ ) of the early deaths and the mean GCS score ( $7.93 \pm 3.88$ ) of the late deaths ( $p < 0.05$ ).

The mean RTS of all patients ( $n: 110$ ) was  $4.33 \pm 1.25$ . The mean RTS of the early deaths ( $n: 49$ ) was  $3.11 \pm 1.19$  and that of the late deaths was  $5.32 \pm 1.78$ ; the ratio was statistically significant ( $p < 0.05$ ).

The mean ISS of all patients was  $46.32 \pm 18.84$ . The mean ISS of the early deaths ( $n: 49$ ) was  $59 \pm 17.85$  and that of the late deaths was  $36.16 \pm 12.43$ ; the ratio was statistically significant ( $p < 0.05$ ). The mean admission APACHE II score of all patients was  $22.98 \pm 8.02$ . The mean admission APACHE II score of the early deaths was  $27.22 \pm 6.78$  years; the ratio was statistically significant ( $p < 0.05$ ).

Considering the admission lactate levels, the mean lactate level of the early deaths was  $6.63 \pm 2.43$  and that of the late deaths was  $4.01 \pm 1.87$ ; the ratio was statistically significant ( $p < 0.05$ ).

Additionally, the admission lactate level was found to be  $> 4$  mmol/L in 70 of the early deaths according to the

first blood test in the emergency room. 35 (58.3%) of these patients died in the early period ( $p < 0.05$ ).

The mean BE of the early deaths was  $-11.5 \pm 4.06$  and that of the late deaths was  $-5.10 \pm 2.15$ , thereby leading to a statistically significant difference ( $p < 0.05$ ).

Systolic blood pressure (SBP), diastolic blood pressure (DBP), pulse, Mean Arterial Pressure (MAP), and Shock Index recorded at the time of emergency admission were statistically lower in the group of patients who died within the first 24 hours ( $p < 0.05$ ). The hemoglobin and hematocrit values were similar between the two groups.

## Discussion

Multitrauma continues to pose an important health problem worldwide due to the mortality or permanent disabilities it might cause. A great deal of previous research has shown that multitrauma affects especially the young population and men and this situation leads to socioeconomic problems due to the loss of labor force. With advances in technology, changes have been made in trauma management. Early interventions during the golden hour are known to be life-saving.

110 patients included in this study were in the 4-91 age range. Men (77.3%) were found to be more exposed to multitrauma. This result is consistent with trauma statistics of many previous studies<sup>6</sup>. Considering trauma etiologies, the most common cause was out-of-vehicle traffic accidents (39.1%). Factors such as the use of safety belts and compliance with speed limits in for car rides and the use of helmets and protective clothing for motorcycle rides, which all are more common today, can prevent high-energy accidents that may result in mortality. With respect to 49 patients who died within the first 24 hours, there was no statistically significant correlation between mortality and trauma mechanism. However, considering those who died in the late period, 71.4% of the cases of falls from height died after the first 24 hours ( $p < 0.05$ ).

Various scoring systems have been used to predict mortality and evaluate prognosis in trauma management for several years. The GCS Developed by Jennett and Teasdale in 1974, is the most widely used scoring system in the assessment of the neurological status of head injuries worldwide<sup>7</sup>. It is simple and useful in assessing patient mortality and morbidity and shows a really good correlation with the severity of head trauma. In our study, the relationship between GCS score and mortality within the first 24 hours was statistically significant ( $p < 0.05$ ).

The Revised Trauma Score obtained through the combined assessment of the GCS score, systemic blood pressure, and respiratory rate is known to help make reliable survival estimates<sup>8</sup>. The mean RTS was  $4.33 \pm 1.25$  for all the patients



included in this study. The mean RTS was  $3.11 \pm 1.19$  for the patients who died in the early period and this value was found to be statistically significant ( $p < 0.05$ ). Considering the GCS score, RTS, ISS, and APACHE II score, a significant difference was observed between the two groups, thereby suggesting that these scoring systems are reliable to use for the prediction of mortality in the early post-traumatic period. The similarity of hemoglobin (HB) and hematocrit (HCT) between the two groups supports the idea that HB and HCT values mislead clinicians during the emergency follow-up of multitrauma patients. Base excess (BE) is reported to predict pre-hospital and emergency room mortality in trauma patients. Previous studies on the association between BE and mortality have shown that higher arterial BE levels are associated with higher in-hospital mortality. Previous studies have also reported an increased mortality rate with increasing BE<sup>9</sup>. The mean BE of the early deaths was  $-11.5 \pm 4.06$  and that of the late deaths was  $-5.10 \pm 2.15$ , thereby leading to a statistically significant difference ( $p < 0.05$ ).

It is stated that the increase in lactate shows the deterioration of tissue perfusion since the early period, and therefore it

is a very important parameter in the diagnosis and follow-up of shock. Additionally, previous research has indicated that initial high lactate levels are more effective in predicting mortality in blunt trauma patients compared to initial BE levels<sup>5</sup>. Considering the initial (admission) lactate levels of the patients in this study, the initial lactate level was  $>4$  mmol/L for 70 of those who died in the early period and 35 (58.3%) of them died in the early period ( $p < 0.05$ ). Therefore, we believe that it is an important parameter for early mortality in trauma patients with high lactate levels and more aggressive treatment should be applied in these patients.

In conclusion, as it is an indisputable fact that the first intervention in the management of patients exposed to multi-trauma contributes significantly to prognosis, similar studies have shown the value of trauma scoring systems in predicting mortality. GCS score, RTS, ISS, and APACHE II score are reliable to use for mortality prediction and high lactate and BD levels can also be used in early mortality prediction. Aggressive treatment may contribute positively to survival in patients with high lactate and BD levels.

**Table 1.** Study population characteristics

	Total	EM (<24 h)	LM (>24 h)	P value
<b>Demographics</b>				
Age, y (mean SD)	44,57±21,93	44,48±21,83	44,74±21,45	> 0.05
Female	25 (%22,7)	11 (%22,4)	14 (%23)	> 0.05
Male	85 (%77,3)	38 (%77,6)	47(%77)	> 0.05
<b>Blunt mechanism (%)</b>				
Pedestrian struct	43 (%39,1)	20 (%46,5)	23 (%53,5)	> 0.05
Falls from height	28 (%26,4)	8(%28,6)	20(%71,4)	< 0.05*
In-vehicle traffic acc.	14 (%12,7)	8 (%57,1)	6(%42,9)	> 0.05
Motorcycle accidents	10 (%9,1)	4 (%40)	6 (%60)	> 0.05
Other causes	15 (%12,7)	8(%53,3)	7(%46,7)	> 0.05
<b>Initial parameters (mean SD)</b>				
Initial GCS	7,17±2,94	5.12 ± 1.89	7.93 ± 3.88	< 0.05*
RTS	4,33±1,25	3,11±1,19	5,32±1,78	< 0.05*
ISS	46,32±18,84	59±17,85	36,16±12,43	< 0.05*
APATCHE II	22,98±8,02	27,22±6,78	19,57±7,32	< 0.05*
Abdomen Trauma	n:34	26 (%76,5)	8 (%23,5)	< 0.05*
Abdomen AIS >3	n:28	23 (%82,1)	5 (%17,9)	< 0.05*
Head Trauma	n:69	22 (%31,9)	47 (%68,1)	< 0.05*
Head Trauma AIS>3	n:65	23 (%34,8)	3 (%65,2)	< 0.05*
Pelvic fractures	n:14	7 (%50)	7 (%50)	> 0.05
Femoral fractures	n:13	6 (%46,2)	7 (%53,8)	> 0.05
Maxillofacial injuries	n:11	3 (%27,3)	8 (%72,7)	> 0.05
Vascular-nerve injuries	n:11	7 (%63,6)	4 (%36,4)	> 0.05
Vertebral fractures	n:15	6 (%40)	9 (%60)	> 0.05
Extremity fractures	n:21	12 (%57,1)	9 (%42,9)	> 0.05
Lact level> 4mmol/L	n:70	35(%58,3)	25(%41,7)	< 0.05*
Lactate	5,17±2,38	6,63±2,43	4,01±1,87	< 0.05*
BE	-7,99±2,79	-11,5±4,06	-5,10±2,15	< 0.05*
SBP	87,72±35	57,57±22,26	111,93±41,25	< 0.05*
DBP	50,29±22,74	32,33±13,51	64,72±24,41	< 0.05*
MAP	62,78±29,52	40,76±18,43	80,46±30,97	< 0.05*
Pulse rate	116,55±32,93	133,06±31,95	103,28±27,4	< 0.05*
Shock Index	1,86±1,32	2,78±1,32	1,13±0,76	< 0.05*
Hemoglobin	10,77±2,82	10,33±2,99	11,12±2,66	> 0.05
Hematocrit	32,45±7,84	31,62±8,52	33,12±7,25	> 0.05

EM: Early mortality, LM: Late mortality, In-vehicle traffic acc.: In-vehicle traffic accidents, Lact level: Lactate level



# Spontaneous Uvula Hematoma

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## Abstract

Uvula hematoma is more commonly seen as a complication of thrombolytics and streptokinase use or after trauma. Although spontaneous uvula hematoma is rare in the literature, we aim to present a rare spontaneous uvula hematoma in our case. A 26-year-old woman was admitted to the emergency service with a feeling of sticking in her throat and difficulty in swallowing. In her physical examination, the uvula was ecchymotic and edematous. She stated that she does not use any antiplatelet and anticoagulant agents. Other system examinations were normal. In some studies, uvula hematoma have been reported after endotracheal intubation and use of antiplatelet. However, uvula hematoma was spontaneously formed in the patient who applied to us. As with all emergency cases, hemodynamic stability and airway patency should be maintained in the first intervention in such airway hematomas. After maintaining the airway, anticoagulation therapy or hematoma drainage, if necessary, constitute the second step of hematoma treatment. The upper aerodigestive system should be checked for bleeding after trauma, endoscopy and intubation, especially in patients with anticoagulant therapy and in patients with systemic bleeding disease.

**Keywords:** Spontaneous, uvula hematoma, emergency medicine

## Introduction

Uvula hematoma is more commonly seen as a complication of thrombolytics and streptokinase use or after trauma<sup>1-4</sup>. Although spontaneous uvula hematoma is rare in the literature, we aim to present a rare spontaneous uvula hematoma in our case.

## Case

A 26-year-old woman was admitted to the emergency service with a feeling of sticking in her throat and difficulty in swallowing. There were no features in the patient's medical history. In her physical examination, the uvula was ecchymotic and edematous (Figure-1). She stated that she does not use any antiplatelet and anticoagulant agents. Other system examinations were normal. The vital parameters of the patient were 36.4° C, heart rate 80 / min, TA: 125/80 mmHg, respiratory rate 20 / min. The hemogram, biochemistry parameters, CRP and coagulation values of the patient were normal. Ecchymosis and edema in the patient's throat were evaluated as uvula hematoma. The patient was asked for an otorhinolaryngology consultation. Otorhinolaryngologist advised the patient to contact the emergency department again if her symptoms increase. In the absence of any symp-

toms, he suggested elective control in the otorhinolaryngology clinic. The patient, who was followed up in the emergency room for 12 hours and had no complaints during the follow-up, was discharged with recommendations.



Figure-1: Uvula hematoma

## Discussion

Previous studies; uvula, mouth, tongue, larynx and hematomas of the face region have been reported. Antiplatelet

treatments, bleeding disorders and traumas have been shown to be the cause of these hematomas<sup>2,3,5,6</sup>. In some studies, uvula hematoma have been reported after endotracheal intubation and use of antiplatelet<sup>1,3</sup>. However, uvula hematoma was spontaneously formed in the patient who applied to us. The patient had no history of drug use, systemic disease and trauma. In only one case, we found spontaneous uvula hematoma<sup>7</sup>. As with all emergency cases, hemodynamic stability and airway patency should be maintained in the first intervention in such airway hematomas. After maintaining the airway, anticoagulation therapy or hematoma drainage, if necessary, constitute the second step of hematoma treatment. If the uvula hematoma is not so serious, spontaneous regression occurs within a few days. If possible, discontinuation of anticoagulants may help in the healing period. Hematoma drainage and surgical treatments are rarely required in cases that cause severe airway stenosis<sup>7,8</sup>. Follow-up was recommended because there was a uvula hematoma in our case which did not cause severe airway stenosis.

## Conclusion

In the management of these patients, priority is to maintain airway clarity. The upper aerodigestive system should be

checked for bleeding after trauma, endoscopy and intubation, especially in patients with anticoagulant therapy and in patients with systemic bleeding disease.

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# The Osborn Wave and Ethanol?

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## Abstract

The Osborn wave which is also known as the J wave in electrocardiogram (ECG) is most commonly detected in the cases with hypothermia. Furthermore, this wave may develop as secondary to many conditions such as hypercalcemia, hypoglycemia, brain damage, ischemic heart disease. The Osborn wave disappears when the underlying cause is recovered. As is known, alcohol is a substance made of ethyl alcohol which may cause severe cardiac problems such as cardiomyopathy, cardiac arrhythmia and cardiac arrest. In the present case report, we wanted to address the association of a typical Osborn wave with high blood level of alcohol by presenting two cases whom Osborn wave was detected after cardiac arrest and hypothermia developed secondary to high alcohol level in the blood; and discuss the association between Osborn wave and high blood levels of alcohol.

**Keywords:** Osborn Wave, Ethanol, Cardiac Arrest, Emergency Room

## Introduction

The Osborn wave is a dome- or hump-shaped deflexion appeared on RST junction (J point) in ECG<sup>1</sup>. The J waves (Osborn waves) were first identified by Dr. Osborn<sup>(2)</sup>. The Osborn wave was identified with many different denominations such as camel-hump sign, late delta wave, hathook junction, hypothermic wave, J point wave, K wave, H wave and current of injury. Although there is not any definite impression about terminology of the aforesaid wave, the most common denomination recently is the Osborn wave or J wave<sup>1</sup>. The Osborn waves are commonly observed in case of hypothermia. Progressive decreases in the pulse and cardiac output occur in extended moderate hypothermia (28-32°C) whereas increases in atrial and ventricular arrhythmias as well as the Osborn waves are detected in ECG<sup>3</sup>. However, Osborn waves were also reported in case of hypercalcemia, sepsis, neuroleptic drug use, hypoglycemia, diabetic ketoacidosis, brain damage, cardiac arrest, Chagas disease, ischemic heart disease, cardiopulmonary arrest developed secondary to over-sedation and Brugada syndrome<sup>4</sup>.

Alcohol is widely used in chemistry, industry and medicine. This compound consists of carbon, hydrogen and oxygen. The most well known alcohol is the ethyl alcohol as it is the essential ingredient of alcohol beverages<sup>5</sup>. The risk for ischemic heart disease and myocardial infarction increases in the individuals who intake alcohol. Alcohol may increase the blood pressure and cause cardiac failure. Severe cardiac

problems such as cardiomyopathy, cardiac arrhythmias and sudden death may develop due to alcohol use<sup>6</sup>.

The aim of the present case report was to focus onto the association between appearance of typical Osborn wave detected in ECG and high blood levels of alcohol via a patient who referred to our ER twice due to cardiac arrest and hypothermia developed as secondary to high alcohol levels detected in the blood and developed Osborn waves and disappearance of the waves by treatment through typical ECG images.

## The Case

A 51-year old male individual who was severely drunk was taken to ER by 112 team. It was learned that the patient was chronically alcoholic based on the information obtained from the relatives and 112 team. The first assessment of the patient was as follows; overall status was good; GCS: 15; the patient was conscious but disoriented due to alcohol. Vital signs; blood pressure: 110/60 mmHg, pulse: 82/min; respiration count: 22/min; body temperature: 36.3°C and SpO<sub>2</sub>: 95%. Blood glucose measured from the finger tip blood was 110 mg/dl. Physical examination was normal. Since the patient was disoriented, neurological examination could not be performed. The patient had not any significant motor deficit as much as assessed. Laboratory tests were ordered. Cardiopulmonary arrest developed during monitoring under med-

ical observation; therefore, resuscitation was started. The patient was intubated; and the cardiac pulse returned after a 5-minute of CPR performance. Vital signs after the CPR; BP: 70/50 mmHg, Pulse: 55/min, RC: intubated; body temperature: 36.4°C; SpO<sub>2</sub>: 98%. The Osborn waves were observed in the ECG (Figure 1). Cerebral tomography was ordered for further tests and diagnosis. Laboratory tests were normal except the blood alcohol level of 211 mg/dl (normal range: <10 mg/dl). There was not any intracranial pathology in the cerebral tomography of the patient. Cardiology department was consulted for any cardiac pathology. Any cardiac pathology was not considered primarily. No pathology was detected in laboratory analyses during monitoring period. Final blood alcohol level was detected as 118 mg/dl. In line with this finding, there were gradually decreasing Osborn waves in ECG series of the patient (Figure 2). After a monitoring period for 12 hours in the ER, the patient was referred to intensive care unit. The patient was extubated at 36th hour in the ICU, laboratory tests were normal and ECG was at normal sinus rhythm without any Osborn waves; discharge was planned after a monitoring period of 48 hours without any symptoms.

The 51-year old male patient whom emergency service team told he was severely drunk and his clothes were wet was taken to our ER approximately 5 days later. First assessment revealed a well overall status as well as somnolence; GCS was detected 14. All clothes of the patient was wet and cold. Vital signs; blood pressure: 130/90 mmHg, pulse: 78/min; respiration count: 20/min; body temperature: immeasurably low and SpO<sub>2</sub>: 96%. Blood glucose measured from the finger tip blood was 106 mg/dl. All clothes of the patient were taken off and he was observed. There was not any abnormal finding in the physical examination of the patient except cold skin. Neurological examination could not be performed since the patient has somnolence. The patient had not any significant motor deficit as much as evaluated. There was not any additional pathology detected in the ECG except the Osborn waves (Figure 3). Depending on the aforesaid findings, heating protocol was started since hypothermia was considered. Intravenous infusion of 0.9% physiological saline which was heated up to 40°C was started. All clothes of the cases were taken off and he was covered with blankets. Electric heaters were placed around the case. A foley catheter was inserted and irrigation was performed with heated water. Heated moist O<sub>2</sub> was administered. Samples were collected and referred for laboratory tests. The body temperature was measured as 35°C through a digital thermometer approximately 2 hours later. The body temperature was detected as 35.7°C at 4th hour of monitoring. The control ECG revealed that the Osborn waves disappeared and the rhythm returned to normal sinus rhythm. There was not any significant pathology except alcohol level of 411 mg/dl (Normal range: <10 mg/dl). Since the tests and treatment process revealed no pathology during a monitoring period of 24 hours, the patient was discharged.

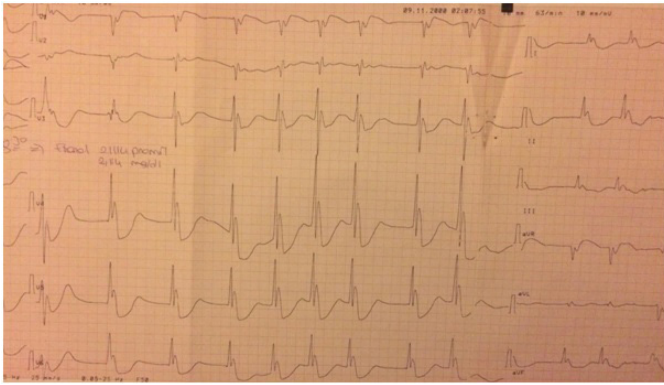
## Discussion

The Osborn waves are commonly observed in case of hypothermia. However, Osborn waves were also reported in case of hypercalcemia, sepsis, neuroleptic drug use, hypoglycemia, diabetic ketoacidosis, brain damage, cardiac arrest, Chagas disease, ischemic heart disease, cardiopulmonary arrest developed secondary to over-sedation and Brugada syndrome<sup>3</sup>. In the present case, the cause of Osborn waves which were reported in the literature was cardiac arrest for the first referral; and the second cause was hypothermia; the blood level of alcohol was detected at very high levels than normal limits.

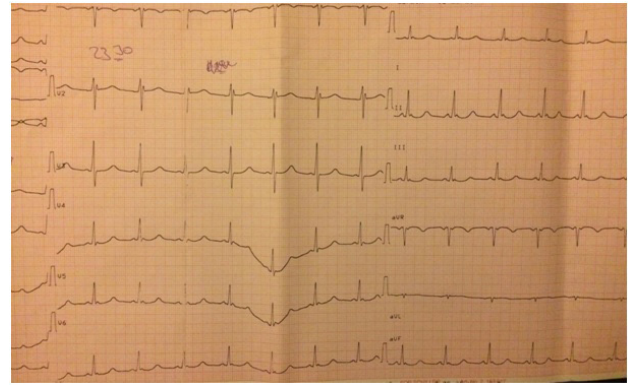
The effects of alcohol use on cardiovascular system include high blood pressure and cardiac failure. Cardiomyopathy, cardiac arrhythmias and sudden death may appear due to alcohol intake<sup>5</sup>. In the present case, cardiopulmonary arrest developed because of possible increase in the blood alcohol level and a considerably short cardiopulmonary resuscitation was performed (approximately 5 minutes). There was not any cardiac pathology detected in cardiac evaluation of the patient. However, the Osborn waves in the ECG of the patient may be assumed as secondary to the cardiac arrest. Second referral was because of development of hypothermia due to possible exposure to a cold environment for a long period in an unconscious state because of high levels of alcohol and the Osborn waves might have developed due to this.

The Osborn waves are temporary findings; therefore, the osborn pattern in ECG disappears when the underlying cause is treated such as return of body temperature to normal level in hypothermic patients<sup>(7)</sup>. The present case had not any pathology and a condition that may cause osborn wave (i.e. hypothermia, cerebral cardiac pathology) in the first referral except high alcohol levels in the blood (211 mg/dl); and the osborn wave pattern gradually decreased and disappeared in line with the decrease in blood level of alcohol during monitoring. Hypothermia and elevation of the blood alcohol level (411 mg/dl) were detected in the second referral; the osborn waves again disappeared in the ECG by rapid heating and decrease of the alcohol level in the blood. The two conditions mentioned above were considered to be related with high alcohol level in the blood.

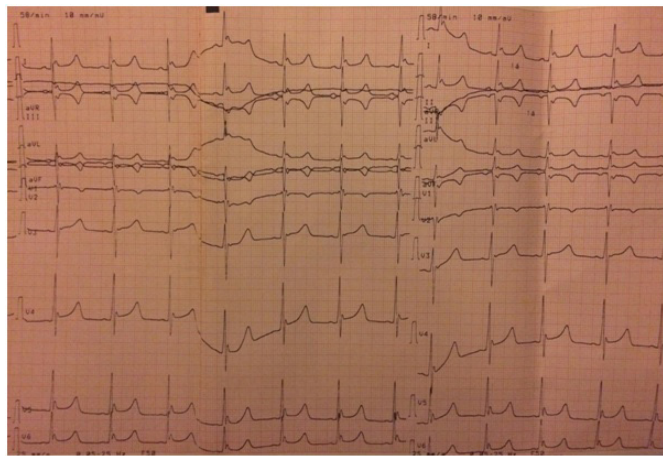
Consequently, detection of the osborn wave would be an important indicator for emergency medicine physicians to investigate the possible causes as well as plan the treatment earlier. We believe that the high blood levels of alcohol that we detected during each referral of the present case is a predictor for possible pathological conditions that may cause the osborn wave in ECG and this would serve as a warning for emergency medicine physicians for close monitoring and treatment of the patients.



**Figure 1:** The Osborn waves were observed in the admitted ECG.



**Figure 2:** ECG demonstrating progressive Osborn wave resolution.



**Figure 2:** ECG demonstrating progressive Osborn wave resolution.

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# Evaluation of low back pain prevalence in emergency department workers

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## Abstract

**Introduction:** Low back pain is a global health problem that causes impediments in people's lives. The aim of this study was to evaluate the prevalence of low back pain of emergency department workers and to evaluate the risk factors with Oswestry Low Back Pain scale as the lumbar region of emergency department workers are vocationally subjected to straining movements due to heavy lifting and sudden movements.

**Method:** The population of the study consists of the employees working in the emergency department within the specified date range. Although there were a total of 150 people in the double center, a total of 126 people agreed to participate because some of them were on leave and some did not want to participate in the study. The sample consisted of 27 doctors, 76 nurses, 12 medical secretaries, 11 cleaning personnel and security personnel. The Oswestry Low Back Pain scale was developed to assess functional impairment. Mann Whitney-U test and Kruskal Wallis -H test were used in statistical evaluations depending on the status of being a numerical independent group, since the correlated variables were categorical (nominal or ordinal) and binary or with more variables.

**Results:** 46.8% (n = 59) of the participants were female and 53.2% (n = 67) were male. When the participants were evaluated according to age groups, 3.2% (n = 4) were between 18-21 years, 49.2% (n = 62) between 22-27 years, 24.6% (n = 31) between 28-33 years, 17.5% (n = 22) 34-39 years old, 5.6% (n = 7) were over 40 years old. According to the sample size of our study, the annual prevalence of low back pain was 55.6% and the prevalence of lumbar hernia was 15.8% in the emergency service personnel. When the groups were evaluated in terms of the diagnosis of lumbar hernia, the OSA of those diagnosed with hernia was  $17.52 \pm 6.93$  and those without lumbar hernia diagnosis was  $8.4 \pm 6.8$ . A statistically significant difference was found between the groups. A statistically significant difference was found in the ostwestry scale score between genders. This difference among the occupational groups was also found to be different statistically.

**Conclusion:** The prevalence of low back pain in the society among the occupational groups, especially in the health sector, is high. In dynamic work environments such as the emergency department, solutions should be developed to reduce the determined risk factors in order to prevent low back pain symptoms after sudden and straining movement.

**Keywords:** low back pain, emergency department, Oswestry low back pain scale

## Introduction

Low back pain is a global health problem that causes impediments in people's lives<sup>1</sup>. Low back pain symptoms arise after wrong movement, heavy lifting, or sudden movement<sup>2</sup>. The majority of adult people have experienced low back pain which is an musculoskeletal dysfunction at least once in their lifetime<sup>3</sup>. Öksüz, in their study, have reported that the incidence of low back pain was 44.1% in the Turkish population<sup>4</sup>. Low back pain in general ranks 5th among the reasons of admission to a health institution in all societies<sup>5</sup>. In the studies, age and gender as well as occupations that require working on foot for a long time have been reported Among the risk factors for low back pain<sup>6</sup>. Dönmez et al. stated occupations requiring sitting for a long time, suffering trauma and lifting heavy loads as risk factors for lumbar disc

hernia<sup>7</sup>. Lifestyle risk factors such as smoking, excessive weight gain, low physical activity increase low back pain and lumbar disc herniation<sup>8, 9, 10, 11</sup>.

Occupations with frequent incidence of low back pain were reported as long-distance drivers, heavy workers, dentists, physiotherapists, nurses, policemen and firefighters<sup>12, 13, 14</sup>. In developed countries low back pain poses an important occupational health problem due to its long duration of treatment and high costs, in addition to the loss of labor force<sup>15, 16</sup>.

The aim of this study was to evaluate the prevalence of low back pain of emergency department workers and to evaluate the risk factors with Oswestry Low Back Pain scale as the lumbar region of emergency department workers are vocationally subjected to straining movements due to heavy lifting and sudden movements.

## METHOD

### Study Design:

This descriptive study is bi-centered and was conducted between 01.10.2019 and 15.11.2019, in the emergency medicine department of Yozgat Bozok University and Emergency Medicine Clinic Health Sciences University Sultan Süleyman TRH. Since the entire population of the study was tried to be reached, no further sample selection was made. The population of the study consists of the employees working in the emergency department within the specified date range. Although there were a total of 150 people in the double center, a total of 126 people agreed to participate because some of them were on leave and some did not want to participate in the study. The sample consisted of 27 doctors, 76 nurses, 12 medical secretaries, 11 cleaning personnel and security personnel. Ethics Committee Approval was obtained for the study. A questionnaire on sociodemographic characteristics of healthcare workers and Oswestry Low Back Pain Scale to evaluate the functional disability status were used as data collection tools. In the evaluation of annual prevalence, low back pain part of the Standardized Nordic Musculoskeletal Questionnaire (NMQ) was used. Body mass indexes (BMI) of the participants were calculated by measuring their body weights and height. According to the World Health Organization (WHO) classification, body mass index ( $\text{kg}/\text{m}^2$ ) of less than 25.0 is evaluated as normal, 25.0 -29.9 as overweight and  $\geq 30.0$  as obese. In the first part of the questionnaire consisting of general questions, demographic characteristics, habits, occupation, duration of professional work, presence of shift work were questioned. Oswestry low back pain scale was used in the 2nd part of the questionnaire. The mean and standard deviations of the Oswestry Low Back Pain scale were calculated in all groups and statistical analysis was performed. The Oswestry low back pain scale average was used as the Oswestry scale average (OSA) in the study.

### Population grouping:

Among the sociodemographical characteristics, gender was grouped into two groups as male and female; age was grouped as Group 1 being 18-21 years old, Group 2 22-27 years old, Group 3 28-34 years old, Group 4 35-39 years old, Group 5 above 40 years old. Marital status was grouped into two as married and single. Number of children was grouped as Group 1 having 0 children, Group 2 having 1 child, Group 3 having of 2 children, and Group 4 having 3 or more children. Occupational groups were divided into four groups as doctor, nurse, medical secretary, and security and cleaning personnel. The weekly working time was divided into 4 groups as 40 hours, 45 hours, 50 hours and 55 hours. The number of years worked was divided into four groups as 0-4 years, 5-9 years, 10-14 years, 15 and over years. Daily working hours was divided into four groups as 8 hours,

12 hours, 16 hours and 24 hours. BMI (body mass index) was divided into three groups as normal weight, overweight and obese. Economical status was divided into 3 groups as Group 1 having income higher than expenses, Group 2 having equal income and expense, and Group 3 having income lower than expenses.

### Used Scale:

The Oswestry Low Back Pain scale was developed to assess functional impairment<sup>17</sup>. Turkish validity and reliability study was performed by Yakut et al.<sup>18</sup>. In this scale, daily life activities are measured in 10 different aspects (pain severity, personal care, lifting, walking, sitting, standing, sleeping, degree of pain variance, social life, travel). There are 6 options for each section with a score of 0 - 5. 0 - 4 points are considered as no disability, 5 - 14 points as mild, 15 - 24 points as moderate, 25 - 34 points as serious, 35-50 points as complete (severe) functional disability. The minimum score obtained from the scale is 0 and the maximum score is 50<sup>19</sup>.

### Statistical analysis:

A statistical software package (SPSS 21.0, Chicago, IL) was used to perform all analyses. For Statistical Analyses, compliance with the parametric test criteria was evaluated by performing conformity to normal distribution test and Kolmogorov Smirnov test. The data obtained from the study conducted within the scope of clinical research were statistically nonparametric. Mann Whitney-U test and Kruskal Wallis -H test were used in statistical evaluations depending on the status of being a numerical independent group, since the correlated variables were categorical (nominal or ordinal) and binary or with more variables. Categorical data are reported as mean  $\pm$  standard deviation and number (percentages), respectively. Statistical significance was set at  $p < 0.05$ .

## RESULTS

A total of 126 health care workers were included in the study. 46.8% (n = 59) of the participants were female and 53.2% (n = 67) were male. When the participants were evaluated according to age groups, 3.2% (n = 4) were between 18-21 years, 49.2% (n = 62) between 22-27 years, 24.6% (n = 31) between 28-33 years, 17.5% (n = 22) 34-39 years old, 5.6% (n = 7) were over 40 years old. The mean age of the participants was  $31.19 \pm 7.54$ . Of the participants, 21.4% (n = 27) were doctors, 60.3% (n = 76) nurses, 9.5% (n = 12) medical secretaries, 8.8% (n = 11) security and cleaning personnel. When the body weights of the participants were evaluated, 73.8% (n = 93) were normal weight, 19% (n = 24) were overweight, and 7.1% (n = 9) were obese. As for the marital status, 44.4% (n = 56) of the participants were married and 55.6% (n = 70) were single. 66.7% (n = 84)

of the participants did not have children, 19% (n = 24) had 1 child, 11.1% (n = 14) had 2 children, and 3.2% (n = 4) had 3 children. As for economical status, 35.7% (n = 45) had higher expense than income, 51.6% (n = 65) had equal expense and income, and 12.7% (n = 16) had higher income than expense. Weekly working hours were over 55 hours in 21.4% (n = 27) of the participants, 50 hours in 35.7% (n = 45), 45 hours in 27.8% (n = 35), and 40 hours in 15.1% (n = 19). 83.3% (n = 105) of the participants had no diagnosis of lumbar hernia and 16.7% (n = 21) had a diagnosis of lumbar hernia (Table 1).

According to the sample size of our study, the annual prevalence of low back pain was 55.6% and the prevalence of lumbar hernia was 15.8% in the emergency service personnel. When the groups were evaluated in terms of the diagnosis of lumbar hernia, the OSA of those diagnosed with hernia was  $17.52 \pm 6.93$  and those without lumbar hernia

diagnosis was  $8.4 \pm 6.8$ . A statistically significant difference was found between the groups (z: -4.411, p = 0.000).

According to the Oswestry low back pain scale, 32.5% (0 - 4 points) of the ED personnel had no disability; 33.3% had mild (5-14 points), 31.7% had moderate (15-24 points), and 2.4% had severe low back pain complaints (25-34 points). Nobody was detected to have Full/Severe (35-50 points) scale score (Table 1).

The Oswestry scale average was  $9.9 \pm 7.66$ . The Oswestry scale average of the female gender was  $11.49 \pm 6.98$ . The Oswestry scale average of the male gender was  $8.53 \pm 8.01$ (Table 3). A statistically significant difference was found in the Oswestry scale score between genders (z: -2.477, p = 0.013)(Table 2).

The Oswestry scale averages according to age groups were  $11.25 \pm 5.9$  for ages of 18-21 years,  $9.75 \pm 7.64$  for 22-27 years,  $9.6 \pm 6.7$  for 28-33 years,  $10.09 \pm 8.58$  for 34-39

**Table 1.** Demographic Characteristics for Low pain

Demographic Characteristics - Independent Variables (IVs)	Name of Characteristics	Label	Number	Percent (%)	Mean	Sdt. Dev.	Scale
<b>Gender</b>	Female (0)	FEML	59	46.8			
	Male (1)	MALE	67	53.2			
	<b>TOTAL</b>		<b>126</b>	<b>100</b>			<b>0-1</b>
<b>Age</b>	<b>TOTAL AGE</b>		<b>126</b>		<b>31.19</b>	<b>7.54</b>	<b>20-50</b>
<b>Age Group</b>	Between 18-21 years		<b>4</b>	<b>3.2</b>			
	Between 22-27 years		<b>62</b>	<b>49.2</b>			
	Between 28-33 years		<b>31</b>	<b>24.6</b>			
	Between 34-39 years		<b>22</b>	<b>17.5</b>			
	Over 40 years		<b>7</b>	<b>5.6</b>			
<b>Marital Status</b>	Single (1)	SG	70	55.6			
	Married (2)	MRD	56	44.4			
<b>Professional Group</b>	Doctor.(1)	DCT	27	21.4			
	Nurse. (2)	NRS	76	60.3			
	Medical Secretery (3)	MS	12	9.5			
	Security And Cleaningpersonnel (4)	SC	11	8.8			
<b>Body Weights</b>	normal weight.(1)	NW	93	73.8			
	overweight(2)	OW	24	19			
	obese (3)	OBS	9	7.1			
	<b>TOTAL</b>		<b>126</b>				<b>1-3</b>
<b>Economical Status</b>	higher expense than income (1)	HE	45	35.7			
	equal expense and income (2)	EE	65	51.6			
	higher income than expense (3)	HI	16	12.7			
<b>Weekly Working Hours</b>	over 55 hours (1)	OV55	27	21.4			
	50 hours (2)	50H	45	35.7			
	45 hours (3)	45H	35	27.8			
	40 hours (4)	40H	19	15.1			
	<b>TOTAL</b>		<b>126</b>	<b>100</b>			<b>1-4</b>
<b>Oswestry Low Back Pain Scale</b>	No Disability(0-4)	ND	41	32.5			
	Mild(5-14)	MD	42	33.3			
	Moderate(15-24)	MR	40	31.7			
	Severe(25-34)	SVR	3	2.4			
	Full/Severe(35-50)	FSV	0	0			
	<b>TOTAL</b>		<b>126</b>	<b>100</b>			

years,  $11.28 \pm 11.04$  for over 40 years (Table 3). There was no statistically significant difference between the ostwestry scale averages among age groups ( $\chi^2 0.233$ ,  $p = 0.994$ )(Table 2).

According to marital status, the ostwestry scale average was  $10.1 \pm 7.71$  in the married group and  $9.6 \pm 7.6$  in the single group (Table 3). There was no statistically significant difference between the groups in terms of marital status ( $z: -0.352$ ,  $p = 0.725$ )(Table 2).

When OSAs were evaluated according to the number of children; OSA of those without children was  $9.7 \pm 7.9$ , OSA of one child group was  $10.3 \pm 6.9$ , OSA of two children group was  $10.8 \pm 7.8$ , OSA of three or more children group was  $8.5 \pm 7.2$  (Table 3). There was no statistically significant difference between the groups ( $\chi^2 1.430$ ,  $p = 0.699$ )(Table 2).

When the Ostwestry scale averages of the participants were evaluated according to BMI (body mass index); it was  $9.2 \pm 7.4$  in the normal weight group was ,  $10.6 \pm 8.2$  in the overweight group and  $16.1 \pm 4.56$  in the obese group (Table 3). BMI was found to be statistically significant between groups ( $\chi^2: 6.249$ ,  $p = 0.044$ )(Table 2).

According to occupational groups, OSA was  $17 \pm 8.9$  in the medical secretaries,  $11.3 \pm 7.76$  in the doctors,  $8.47 \pm 6.98$  in the nurses, and  $9.3 \pm 6.3$  in the cleaning and security personnel (Table 3). This difference among the occupational groups was also found to be different statistically ( $\chi^2: 11.443$ ,  $p = 0.010$ )(Table 2).

When ostwestry scale averages (OSA) of the groups was evaluated according to the years worked; it was  $8.7 \pm 7.36$  in those worked 0-4 years,  $10.05 \pm 7.68$  in 5-9 years,  $12.25 \pm 7.42$  in 10-14 years, and  $11.7 \pm 9.67$  in over 15 years (Table 3). When the OSA of the employees were evaluated according to the weekly working hours, the OSA was  $9.3 \pm 7.82$  in the 40-hour employees,  $12.1 \pm 8.12$  in the 45-hour employees,  $9.3 \pm 7.52$  in the 50-hour employees, and  $8.4 \pm 6.9$  in the employees over 55 hours per week (Table 3). No significant difference was found between the groups when the ostwestry scale was evaluated in terms of worked years and weekly working hours ( $\chi^2: 3.551$ ,  $p = 0.314$ ;  $\chi^2: 3.266$ ,

$p = 0.352$ )(Table 2). OSAs of the groups according to daily working hours were calculated. OSA was  $10.9 \pm 8.05$  in the employees working 8 hours daily,  $7.7 \pm 7.47$  in the employees working 12 hours ,  $11.7 \pm 5.2$  in the employees working 16 hours,  $8.6 \pm 6.63$  in the employees working 24 hours. There was no statistically significant difference between the groups ( $\chi^2: 5.573$ ,  $p = 0.134$ ).

When the groups were evaluated in terms of economical status, ostwestry scale average (OSA) was  $11.2 \pm 8.3$  in the group with more expenses than income ,  $9.26 \pm 7.13$  in the equal income and expense group, and  $8.8 \pm 7.67$  in the income higher than expenses group (Table 3). There was no statistically significant difference between the groups economically ( $\chi^2 1.739$ ,  $p = 0.419$ ).

When OSA was evaluated according to smoking status; OSA was  $9.01 \pm 7.71$  in the smoker group and  $10.5 \pm 7.62$  in the non-smoker group (Table 3). There was no statistically significant difference between the groups ( $z: -1.329$ ,  $p = 0.184$ )(Table 2).

## DISCUSSION

Nowadays, we are faced with especially neck and low back pain arising from posture disorders and working conditions. Low back pain is one of the most expensive diseases both in terms of labor loss and treatment cost, and its treatment often requires a multidisciplinary approach<sup>15</sup>. Seen in many lines of work, low back pain symptoms in the hospital personnel arise from physical factors such as heavy lifting, bending forward and staying in a stationary position during work<sup>20</sup>.

In our study, one-year low back pain prevalence was found to be 55.6%, and similar results were obtained on the prevalence of low-back pain in hospital staff stated in the literature<sup>20,21,22</sup>. It was determined that 15.8% of the emergency department employees were diagnosed with hernia. The incidence of hernia reported in previous studies on her-

**Table 2.** Statistical Analysis Results With Ostwestry Scala Average (OSA)

	$\chi^2$ or $z$	$p$
Gender	-2.477**	0.013
Age Group	0.233*	0.994
Marital Status	-0.352**	0.725
Number of children	1.430*	0.699
BMI	6.249*	0.044
Professional Group	11.443*	0.010
Year Of Work	3.551*	0.314
Weekly Working Hours	3.266*	0.352
Economical Status	1.739*	0.419
Smoking Status	-1.329**	0.184

\*\*Mann Whitney U Test result with z and \*Kruskal Wallis –H test result  $\chi^2$ . Statistical significance was set at  $p < 0.05$ .

**Table 3.** Ostwesty Scala Mean (OSA) scores in groups

		Ostwesty Scala Mean (OSA)± standard deviation
<b>Gender</b>	Female	11.49 ± 6.98
	Male	8.53 ± 8.01
<b>Age Group</b>	Between 18-21 years	11.25 ± 5.9
	Between 22-27 years	9.75 ± 7.64
	Between 28-33 years	9.6 ± 6.7
	Between 34-39 years	10.09 ± 8.58
	Over 40 years	11.28 ± 11.04
<b>Marital Status</b>	Single	9.6 ± 7.6
	Married	10.1 ± 7.71
<b>Professional Group</b>	Doctor	11.3 ± 7.76
	Nurse	8.47 ± 6.98
	Medical Secretary	17 ± 8.9
	Security And Cleaning personnel	9.3 ± 6.3
<b>Body Weights</b>	normal weight	9.2 ± 7.4
	overweight	10.6 ± 8.2
	obese	16.1 ± 4.56
<b>Economical Status</b>	higher expense than income	11.2 ± 8.3
	equal expense and income	9.26 ± 7.13
	higher income than expense	8.8 ± 7.67
<b>Weekly Working Hours</b>	over 55 hours	8.4 ± 6.9
	50 hours	9.3 ± 7.52
	45 hours	12.1 ± 8.12
	40 hours	9.3 ± 7.82
	35 hours	9.3 ± 7.82
<b>Year Of Work</b>	0-4 years	8.7 ± 7.36
	5-9 years	10.05 ± 7.68
	10-14 years	12.25 ± 7.42
	over 15 years	11.7 ± 9.67
<b>Number Of Children</b>	without children	9.7 ± 7.9
	one child group	10.3 ± 6.9
	two children group	10.8 ± 7.8
	three or more children group	8.5 ± 7.2
<b>Smoking Status</b>	smoker group	9.01 ± 7.71
	non-smoker group	10.5 ± 7.62

nia and health care workers was similar to our study<sup>13,23</sup>. In some studies, annual prevalence of low back pain of individuals was reported as 25-40%<sup>24-26</sup>. These results suggest that, the possibility of incidence of herniated disc is higher in health workers than the general population due to heavy working conditions.

When the age groups of the emergency department personnel were compared in terms of Ostwesty scale averages (OSA), it was determined that the Ostwesty scale average was highest in the group above 40 years old, but no significant difference was found between the other age groups. The mean scores of the group over the age of 40 and the group between the ages of 18-21 show similarity. In the literature, the low back pain study conducted by Karadağ and Yıldırım on nurses, showed similar results with our study in nurses with younger age groups, and it was stated that this might result from the insufficient experience and education levels of nurses causing them to be affected more quickly by nega-

tive occupational factors<sup>13</sup>.

In our study, it was found that, among the sex groups, the ostwesty scale average of women was higher than that of men. Some studies show parallels with our study<sup>20-27</sup>. However, in another study conducted in Saudi Arabia in the literature, it is reported that there is no difference in low back pain between female sex and male sex and that gender is not a risk factor in low back pain symptoms<sup>28</sup>. This leads us to think that there is a regional variation in the risk factors for low back pain, and that the female population in our country has more pain complaints compared to the male gender due to the lack of assistance in the home environment as well as taking on the burden of housework during rest periods.

In our study, marital status of the participants did not cause a statistically significant difference in the Ostwesty scale averages (OSA); but OSA was lower in the married group. There was also no statistically significant difference between the number of children of emergency department

workers; and OSA was lower in those with 3 or more children. Parallel results have been reached in some studies in the literature<sup>23,29</sup>. This suggests that when the number of children increases spouses or domestic assistants are influential in child care, and therefore their presence decreases ostwestry scale average.

When emergency department personnel were divided into groups according to BMI, obese employees had the highest Ostwestry scale average. Similar results have been found with the studies in the literature<sup>20,30</sup>. There was a significant difference in OSA scores between the groups. We think that BMI is an important factor that increases the symptoms of low back pain, given the increasing burden on the lumbar vertebrae with the increase in BMI.

In our study, there was a significant difference between the groups when OSA among the occupations was evaluated and the Ostwestry scale average was found to be the highest in medical secretaries. Simsek et al and Tezel et al. in their study on health care workers found similar results to our study<sup>27,30</sup>. We think that working in the same position and sitting for a long time and therefore staying inactive increase the back pain symptom.

In our study, when the economic situation was evaluated in terms of the effect of low back pain; while OSA was higher in the group with expenses lower than income, there was no significant difference between the groups. In contrast to our study, it was reported in a previous study that those with low-income had higher back pain<sup>31</sup>. Regarding the OSA value being higher in low income group in our study, we think that economic situation affects low back pain as this group work at domestic works outside the working environment in daily work.

In the literature, it has been reported that the incidence of low back pain increases with increasing number of working weeks in a year and years worked<sup>13,29</sup>. In our study, unlike the literature, the averages of the Ostwestry scale results were not different between the groups. In a study conducted according to daily working hours, it was reported that there was a risk factor for low back pain<sup>32</sup>, and in another study it was reported that it did not affect low back pain<sup>33</sup>. In our study, it was not found to be a risk factor in daily working hours like weekly working hours. We think that the disparity between the studies in terms of daily working hours being a risk factor result from the differences in countries and that the working conditions vary throughout the working life in each country.

It is stated that the use of nicotine disrupts nutrition of the spine discs and makes the disc more susceptible to external factors and increases the risk of low back pain by causing contractions in the vessels and thereby decreasing blood flow in the vertebrae and muscles<sup>34</sup>. Altinel and Dilbaz reported that smoking increases low back pain<sup>33,34</sup>. According to the results of our study, unlike these studies, there was no increase in low back pain symptoms in smokers compared

to non-smokers. Verkek et al. reported that smoking does not affect low back pain<sup>35</sup>.

Our study was limited in terms of the low number of participants in the groups of patient caregivers, referral staff and security personnel; therefore, there was a limitation of evaluation in these groups of emergency department workers.

## CONCLUSION

The prevalence of low back pain in the society among the occupational groups, especially in the health sector, is high. In dynamic work environments such as the emergency department, solutions should be developed to reduce the determined risk factors in order to prevent low back pain symptoms after sudden and straining movement. Especially in terms of occupational health, medical secretaries have a high risk of low back pain because they remain stationary in the same position. We think that by raising awareness of the health personnel on the issue through training, the loss of labor and, accordingly, treatment costs can be reduced.

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# A Case of Suicide by Hara-Kiri in Turkey

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## Abstract

**Introduction:** Hara-Kiri, a traditional way of suicide in Japan, is a transverse stab wound on the abdomen. Suicide attempt rate with knife injuries on the abdomen is higher in Japan than in other countries, and especially there are very few clinical data about stab wound injuries involving the transverse section of the abdomen. There are no studies in our country about self-stabbing which is a psychiatric-surgical problem.

**Case:** A 62-year-old male patient admitted to the emergency department by ambulance for stabbing himself due to psychological problems. The omentum, stomach major curvature, and transverse colon were protruded from the transverse defect on the midline of the abdomen which is approximately 20 cm. After initial intervention and stabilization in the emergency room, the patient was transferred to the operation room and underwent urgent surgery.

**Conclusion:** The evaluation of the vital signs and physical examinations are important in suicidal patients and also the anamnesis regarding the source of the stab wounds could help dictate treatment and predict outcomes. Although mostly being non-lethal, abdominal stab injuries in suicidal patients can be significant. Also, the treatment should be planned in collaboration with the psychiatric team in survivor suicidal patients postoperatively.

**Keywords:** Abdominal injuries, Turkey, self-harm, stab wound, Hara-Kiri, suicide, emergency

## Introduction

Hara-Kiri, a traditional way of suicide in Japan, is a transverse stab wound on the abdomen. Suicide attempt rate with knife injuries on the abdomen is higher in Japan than in other countries, especially there are very few clinical data about stab wound injuries involving the transverse section of the abdomen. There are no studies in our country about self-stabbing which is a psychiatric-surgical problem. In the first evaluation of these cases in the emergency room, tips on whether suicide or murder should be noted. A rare self-inflicted abdominal stabbing was discussed in this case, which is also known as Hara-Kiri.

## Case

A 62-year-old male patient was admitted to our emergency department with a penetrating stab injury. Approximately 20 cm horizontal incision was observed at the midline of the abdomen is where the omentum, stomach major curvature, and transverse colon protrude. No signs of assault on his body. The patient was consulted with general surgery and anesthesia to take the patient to emergency operation with

the inotropic support after fluid and erythrocyte suspension replacement was performed because the patient was hypotensive and his Glasgow coma scale was 10 points. Antibiotherapy and tetanus prophylaxis was given. The patient's defect on the abdomen was covered with isotonic wetted compress and the patient was referred to the operation room. Anamnesis obtained from his relatives revealed that the patient had psychological problems and that he had attempted suicide before. Recently, he suffered from pain due to additional illnesses and stabbed himself because of financial problems. After the operation, he returned to health in a couple of days and also confessed his suicide. As the follow-up in the intensive care unit, psychiatric consultation was performed and the patient was discharged after treatment.

## Discussion

Abdominal stab injuries and suicide attempt rates are higher in Japan than in other countries, and there are few clinical data on injuries involving the transverse incision of the abdomen, especially the hara-kiri<sup>1</sup>. Due to its rarity in our country, there is no study on the incidence of hara-kiri injuries. According to the study by Kato K<sup>2</sup> and colleagues, the ratio of males to



<http://dergipark.org.tr/tr/journal/2851/workflow/183719/download/dialog-post-file/3123251>

females and the ratio of mood disorder patients to normal patients were significantly higher in the hara-kiri group compared to the others. Male sex and mood disorder are noteworthy in this case. Results of Takai M and colleagues' study indicated that those who attempted hara-kiri suicide were likely to be male, be diagnosed with schizophrenia, survive, and be married<sup>3</sup>. Although there were no symptoms of schizophrenia, in this case, there was a mood disorder and the patient was a married male. However hara-kiri patients are observed to be susceptible to depression, it is important to note the evidence of suicide attempts or murder wounds in the first examination of the cases<sup>4</sup>. The location of the stab wounds on the physical examination, vital signs, and state of consciousness are indicative of determining the treatment method and prognosis of the patient. Vital signs stabilized with supportive treatment and no signs of assault have seen except only 5 cm transverse incision with organ protrusion on the abdomen. Suicidal abdominal and retroperitoneal injuries are most likely not-lethal. The traditional approach to patients with penetrating injuries with evisceration is the operation of all patients. Suicidal self-inflicted injuries can be fatal, should be treated with a cooperative approach in terms of surgery and psychiatry, even if there may be changes in treatment according to the site of the wound<sup>5</sup>. Psychiatric support was obtained in the post-op period during follow-up and discharge planned by the surgical team.

## Conclusion

Suicide attempts involving the abdominal transverse incision called Hara-Kiri is rare in Turkey. Vital signs, state of

consciousness and locations of the stab wounds in the first examination at the emergency room provide dictating the treatment and predict the prognosis.

The condition and location of the stab wounds overestimate about suicide attempts or attempted murder (self-inflicted vs. assault-induced) and affect clinical outcomes. Mostly non-lethal self-stab wounds can sometimes cause significant and urgent surgical intervention. As a consequence, the traditional approach to the management of penetrating injuries with evisceration is surgical intervention, and the treatment should be planned in collaboration with the psychiatric team in suicidal patients postoperatively.

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# Thyrotoxic Hypokalemic Periodic Paralysis: Case Report

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## Abstract

Thyrotoxic hypokalemic periodic paralysis is characterized by muscle paralysis and acute hypokalemia that secondary to hyperthyroidism, often detected in men and in Asians. The increase in Na-K ATPase activity as a result of increased beta adrenergic stimulation due to thyrotoxicosis causes to decrease intravascular potassium level resulting paralysis. In our study, we aim to discuss a case who applied with lower extremity paralysis in the emergency department and diagnosed with THPP.

**Keywords:** hypokalemia, paralysis, periodic, thyrotoxicosis

## Introduction

Hypokalemic periodic paralysis is a neuromuscular disorder usually seen as familial autosomal dominant or sporadic with hyperthyroidism. In both forms, it presents with weakness in the lower extremity in the morning.<sup>1</sup> The mechanism of formation of thyrotoxic hypokalemic periodic paralysis (THPP) is an increase in beta adrenergic stimulation due to thyrotoxicosis, resulting in over-activation of Na-K ATPase pump, consequently in excessive passage of potassium into the cell. It presents with episodes, the duration of the attack can be shortened by K<sup>+</sup> supplement.<sup>2</sup> In this case, we wanted to talk about the steps of THPP detection and treatment via a case of male patient who had muscle weakness.

## Case Report

A 44-year-old male patient presented with complaints of weakness in his legs and difficulty in moving in the emergency department. It was learnt from his history that after a heavy dinner, he tried to get out of bed towards morning and had difficulties to move. there was no known additional disease, 3 months ago he was admitted to the neurosurgery polyclinic with complaints of pain and weakness in his legs and his examinations were still continuing. In neurological evaluation; he was conscious, his cooperation and orientation was good, muscle strength in his bilateral upper extremities was 5/5, in his lower extremities was 3/5, sen-

sory and reflex examination were normal. Other systemic examinations were natural and the patient with no family history of a disorder was taken to observation room. Muscle strength in the first hour of follow-up was 5/5 in the bilateral upper extremity and 1/5 in the lower extremity. Potassium (K<sup>+</sup>) level was 1.9 mmol/L in the innitial tests and K<sup>+</sup> level was 1.3 mmol / L in the control blood sample, thereon the patient was replaced with 30 mEq K<sup>+</sup> at 10 mEq/h. Despite the replacement, K<sup>+</sup> value was 1.4 mmol / L and therefor the patient with a preliminary diagnosis of thyrotoxic hypokalemic periodic paralysis was performed a test for assessment of thyroid stimulating hormone (TSH). TSH value was <0.006 uIU / ml (0.27-4.2).

At the 15th hour of the patient's follow-up with K<sup>+</sup> replacement therapy, it was observed that the decrease in muscle strength was regressed and the muscle strength of the lower extremities was 3/5. The potassium level of the patient who had 70 mEq K<sup>+</sup> replacement therapy at 10 mEq / h was 4,7 mmol/L. After the 24th hour in the emergency department, it was learned that the patient who was transferred to the internal medicine department was diagnosed with autoimmune thyroiditis and was discharged with good health on the 5th day of hospitalization.

## Discussion

THPP is a disease characterized by muscle paralysis, acute hypokalemia without any deficit of total body potassium and hyperthyroidism.<sup>3</sup> Failure in the awareness and treatment of

this disease may lead to lethal cardiopulmonary complications due to low serum potassium<sup>4</sup>. Hyperthyroidism is one of the risk factors for THPP. Although the most common cause of hyperthyroidism is Graves' disease, any cause of thyrotoxicosis can cause THPP.<sup>4</sup> In our case; TSH value was <0.0006uIU /ml, free T4 value was 2.46 ng/dl and TSH receptor blocking antibody level was 3.30 IU/L. The patient was diagnosed with autoimmune thyroiditis (Graves' disease). Although thyrotoxicosis and thyroid diseases are more common in women, as opposed to this situation THPP is more common in men.<sup>5</sup> The patient who is mentioned in our case was also a man.

It is not known exactly that with what mechanism hyperthyroidism causes hypokalemic periodic paralysis, but the common view is that thyroid hormones increase the response of beta-adrenergic stimulation and cause an increase in Na-K ATPase activity. Potassium passes into the cell with increased Na-K ATPase activity and as secondary to hyperpolarization, a decrease occurs in muscle excitability. It is also thought that insulin resistance, which is accompanied by hyperinsulinemia, may also play a role in the pathogenesis. In the study conducted by Soonthornpun and colleagues, subjects with THPP had more severe insulin resistance than thyrotoxic patients without paralysis.<sup>6</sup> This may be explained by the synergistic action of insulin with thyroid hormones, thereby increasing Na-K ATPase activity. For this reason, paralysis attacks develop after an exercise and heavy carbohydrate consumption. In a patient with THPP, the clinic is fairly typical: a young man, the story of a high-carbohydrate meal or a heavy exercise, wakes up not being able to get out of bed because of lower extremity paralysis which is started after the midnight.<sup>7</sup> In history of our patient, there was a complaint of weakness in the legs after eating a heavy dinner, which had too much fat and carbohydrate content.

Attacks usually occur last hours of the night.<sup>2</sup> This can be explained by the fact that some hormones that affect the Na-K ATPase pump and increase the entry of K<sup>+</sup> into the cell have a diurnal rhythm. In our case, according to history of our patient, there was no loss of muscle strength while he was going to bed at night, but he could not get out of bed in the morning.

Treatment of THPP should include the management of hypokalemia and the treatment of the underlying hyperthyroid state. Oral or intravenous potassium administration is on the agenda to accelerate muscle building and prevent cardiopulmonary complications.<sup>8</sup> Doses required for K<sup>+</sup> re-

placement ranges from 10 to 200 mEq and if hypokalemic cardiopulmonary complications didn't develop, replacement should be done slowly. Non-specific beta-blockers such as propranolol are recommended as alternative therapy.<sup>8</sup> Administration of propranolol can be a more controlled option in cases of that strict evaluation of K<sup>+</sup> level. We anticipated that the K<sup>+</sup> level was going to continue to decrease and we started to K<sup>+</sup> replacement therapy under cardiac monitorization. In our patient whose post-replacement values improved and the paralysis regressed, no complications related to the replacement occurred during the follow-up.

## Conclusion

We present a 44-year old male patient diagnosed with THPP in the emergency department and wanted to talk about treatment experience resulted positively to draw attention to the disease which is rarely seen and therefore difficult to be brought to mind by physicians.

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# Management of a Patient with a Single Coronary Artery Anomaly During the Heart Attack

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## Abstract

The presence of coronary arteries originating from the single coronary orifice is a rare congenital anomaly. In case of obstruction, the whole heart's nutrition is disrupted and diagnosis, intervention, and treatment are important as there is a risk of encountering high-risk clinical conditions, especially sudden cardiac death at a young age. In this article, we present a patient with coronary artery anomaly originating from a single coronary orifice and presenting to the emergency department with angina.

**Keywords:** Coronary artery anomaly, single coronary artery, angina, emergency medicine

## Introduction

The right coronary artery (RCA) and the left coronary artery (LMCA) originate from the right and left sinus Valsalva of the aortic root. The right coronary artery (RCA) is an artery that flows blood to the right atrium, right ventricle, and left ventricular posterior wall. The left coronary artery (LMCA) is an artery located in the left half of the posterior part of the pulmonary trunk and separated from the left anterior descending artery (LAD) and the left circumflex artery (LCx), and the right coronary artery originates at a lower level than the origin of the left coronary artery.

The term single coronary artery is a congenital anomaly in which both the right and left coronary arteries originate from a single ostium in the aorta and feed the whole heart, and its incidence has been reported to be between 0.02-0.04% in various angiographic series<sup>1</sup>.

Patients with coronary artery anomalies may also present a wide range of symptoms from chest pain to sudden death. These varying symptoms are depending on the affected area of the heart, usually asymptomatic until congestion, and are responsible for approximately 20% of sudden deaths in young athletes.

For this reason, it should be considered and well known by all physicians who are interested in coronary artery anomalies in order to make correct diagnosis and treatment decisions and to avoid problems that may occur during coronary interventions<sup>2</sup>.

In this study, we aimed to draw attention to the management of a case with coronary artery anomaly originating from

a single coronary orifice which is detected in coronary angiography of a case who apply to the emergency room with typical chest pain and positive electrocardiogram changes.

## Case Presentation

A 68-year-old male patient applied to our emergency room with complaints of chest pain that started 1-2 hours ago. He had a history of diabetes and hypertension. On arrival examination, the general condition was good, cooperative, orientated and sudden onset of chest anterior wall pain was described. In the physical test performed in the emergency room; blood pressure was 180/80 mmHg, pulse: 100/minute, there was minimal ral in bilateral lower zones of thorax, Electrocardiography showed that ST-segment depression in leads D2-D3-AVF and V2-V6 (Figure 1). All other systemic examinations were normal. Acetylsalicylic acid 300 mg (oral), heparin 5000 units (intravenous), ticagrelor 180 mg (oral) were administered in the emergency room and immediate coronary angiography was planned. Coronary angiography (Figure 2) revealed a left main coronary artery (LMCA), a left descending artery (LAD), a circumflex artery (Cx), and a right coronary artery (RCA), which was rarely seen that emerged from a single orifice (originating from the right coronary artery). A stent was applied to the obstructed RCA. No additional congenital anomaly was detected and the patient was discharged with medical treatment.

## Discussion and Conclusion

In a study performed by Yıldız et al. about coronary artery anomaly cases, out of 12457 patient's angiography reports, only 2 (0.016%) had coronary arteries originating from a single coronary artery<sup>3</sup>. In an angiography study of 10239 patients performed by Çilingiroğlu, only 2 patients (0.01%) were detected<sup>4</sup>. In both studies, coronary arteries originated from the right coronary sinus in coronary angiography reports. In our case, the coronary arteries originated from the right coronary sinus as in these studies.

In postmortem studies, Nethan et al. found this anomaly in 3 cases out of 216 patients. In this study, the coronary arteries originated from the left coronary sinus<sup>5</sup>.

In the study of Taylor et al., 44 patients had a single coronary artery among 256 patients with a congenital anomaly. It has been observed that the risk of sudden death is greater when a single coronary artery originates from the right coronary sinus<sup>6</sup>.

In our case, all coronary arteries originated from a single coronary sinus (right coronary sinus). This is very rare in the literature. There are two possibilities for single coronary sinus anomaly; the arteries of the opposite side may leave this main coronary artery after hatching and go to their irrigation area or this artery will circulate the whole heart and blood. There are two types of risk in this anomaly. First, when a single coronary artery emerges from the aorta, the blood supply of the whole heart is disrupted at the same time in the stenosis on this root<sup>7</sup>. The second is a risk of sudden death, if the coronary artery from the opposite side passes between the aorta and the pulmonary artery while passing into its irrigation area<sup>8</sup>.

As a result, "coronary artery originating from a single coronary orifice" anomaly causes symptoms like other coronary artery diseases and the same treatment protocols are

applied. However, although they are rare anomalies, they should be planned carefully because they cause life-threatening conditions. We believe that effective management of the cases should be experienced in large centers where coronary angiography is performed frequently, especially in order to make the correct diagnosis, treatment decisions, and avoid the problems that may arise during the coronary angiography procedure and surgical intervention.

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# A Case Report: Herpes Zoster With Sacral Involvement

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## Abstract

**Introduction:** The Varicella Zoster Virus (VZV) is a member of the herpes virus family. It is usually characterized with neuralgia which is accompanied by painful vesicles that involve one side or more than one neighboring dermatome regions.

**Case:** The 77-year-old male patient visited the emergency service with the complaint of pain in the right gluteal region that had been going on for the last 2 days. The physical examination of the patient revealed diffuse vesicular-pustular lesions in the right sacral (gluteal) region. The treatment of the patient was started by the department of dermatology with valaciclovir, and the patient was discharged with recommendations.

**Discussion:** Studies that have been carried out so far on HZ showed that the probability of having HZ increases noticeably by aging. While virus-specific cellular immunity has a very important place in controlling viral activation and dissemination, VZV infections may progress more severely in patients with weakened immune systems. According to other studies in the literature, the most frequently involved region is the thoracic region, while it is followed by the cervical, lumbar and sacral regions. As a result of antiviral treatments, reduction was observed in HZ rashes and severity of pain. Acyclovir, valaciclovir, brivudine and famciclovir are drugs that may be used in treatment of HZ infections, while the effects and safety of these drugs are similar.

**Conclusion:** As a consequence, it should be kept mind that HZ, which develops in geriatric patients and individuals with weaker immune systems, may also appear with sacral region involvement, which is rarer, in addition to its typical regions of involvement.

**Keywords:** Sacral pain, varicella zoster

## Introduction

The Varicella Zoster Virus (VZV) is a member of the herpes virus family<sup>1</sup>. Primary VZV infection stays latent in the posterior root and cranial nerve ganglia. It is usually characterized with neuralgia which is accompanied by painful vesicles that involve one side or more than one neighboring dermatome regions. Decreased immune responses that are specific to viruses that develop due to aging, immunosuppressive diseases or medical treatments usually lead to an increased in the risk of HZ (Herpes Zoster)<sup>2</sup>. HZ prevalently involves the cervical, trigeminal and lumbar regions, while it occasionally involves the sacral region. In our article, we aimed to present a case that had sacral involvement, which is a more rarely observed form of HZ.

## Case

The 77-year-old male patient visited the emergency service with the complaint of pain in the right gluteal region that had

been going on for the last 2 days. The physical examination of the patient revealed diffuse vesicular-pustular lesions in the right sacral (gluteal) region (Figure-1). The vital parameters of the patient were as BP: 140/90 mmHg, temperature: 36.7 °C and heart rate: 76/min. The patient had a history



**Figure-1:** The vesicular-pustular lesions in the right sacral region of the patient

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of diabetes mellitus. In the blood tests of the patient, hemogram was normal, glucose among the biochemical analysis parameters was 210 mg/dL, and the other values of the patient were normal. Additionally, the C-reactive protein value of the patient was 1.43 mg/dL (normal range: 0-0.5 mg/dL). With the diagnosis of HZ, dermatology consultation was requested for the patient. The treatment of the patient was started by the department of dermatology with valaciclovir, and the patient was discharged with recommendations.

## Discussion

Studies that have been carried out so far on HZ showed that the probability of having HZ increases noticeably by aging. The incidence of HZ increases in the age range of 50 to 60 years, and this increase becomes more noticeable over the age of 60<sup>3,4,5</sup>. Decreased cellular immunity is one of the well-defined risk factors in HZ development. While virus-specific cellular immunity has a very important place in controlling viral activation and dissemination, VZV infections may progress more severely in patients with weakened immune systems<sup>6</sup>. It was reported that higher numbers of mucocutaneous lesions develop and recovery takes longer in immunosuppressed patients in comparison to normal patients<sup>7</sup>. The typical regions of involvement in HZ were reported from the most prevalent to the least asthethoracic (53%), cervical (20%), ophthalmic (15%) and lumbosacral (11%) regions<sup>7,8</sup>. According to other studies in the literature, the most frequently involved region is the thoracic region, while it is followed by the cervical, lumbar and sacral regions. We are reporting on an HZ case that had sacral involvement. In VZV infections, the diagnosis is characteristically made by finding vesicles that have formed groups on the erythematous base in the sensory nerve dermatome. In our patient, there were vesicular regions in the form of groups in the right sacral (gluteal) region.

The immune system is important in prevention of recurrent HZ attacks. In individuals with suppressed immune system, the disease may lead to viremia in addition to wider-spread and severe rash on the skin. In such cases, systemic dissemination may occur as a result of VZV reactivation without displaying skin-related symptoms. While recovery from the disease is possible in 1-2 weeks in individuals with normal immune systems, HZ may last 2-4 weeks if untreated in those with malign diseases or history of organ transplantation<sup>9</sup>. A study by Chang et al. on HZ patients reported neurological complication rate to be 11.8%, while the most frequent complications were Ramsay Hunt syndrome

and segmental extremity paresis<sup>10</sup>. As a result of antiviral treatments, reduction was observed in HZ rashes and severity of pain. Acyclovir, valaciclovir, brivudine and famciclovir are drugs that may be used in treatment of HZ infections, while the effects and safety of these drugs are similar<sup>11</sup>.

## Conclusion

As a consequence, it should be kept mind that HZ, which develops in geriatric patients and individuals with weaker immune systems, may also appear with sacral region involvement, which is rarer, in addition to its typical regions of involvement.

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# Evaluation of fatal trauma cases presented to the emergency room

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## Abstract

**Objective:** The aim of this study was to investigate the demographic and clinical characteristics of fatal trauma cases presenting to the Emergency Department of XXX Training and Research Hospital in Turkey.

**Methods:** In this retrospective study, the forensic cases of fatal trauma patients admitted to the emergency department between 15.06.2017 and 15.06.2019 were obtained from the hospital's automation system, and the patient files and hospital police records were evaluated.

**Results:** The most common cause of forensic trauma cases was pedestrian accidents (n=18; 25%), and the least common cause was crush injuries by a heavy object (n=2; 2.8%). The most common site of trauma was the cranial region (n=45; 62.5%). Forty-six patients died (63.9%) in the emergency room and 26 (36.1%) at various clinics. The average duration of active dying was  $3.7 \pm 17.9$  hours. Fifty-four cases (75%) were found to be ethanol-negative and 18 (25%) were ethanol-positive.

**Conclusion:** The most common forensic trauma cases are pedestrian accidents and seen in male patients. Most of these patients die in the emergency room, where they are first admitted. The most important factor in reducing mortality is preventing the occurrence of trauma. In addition to giving the person adequate and appropriate treatment, physicians also have the responsibility of writing clear and intelligible forensic reports in accordance with the laws and hospital rules.

**Keywords:** emergency, forensic case, death

## Introduction

Injuries due to all kinds of firearms, explosives, blunt, perforating and penetrating objects, traffic accidents, falls, physical and sexual assault, work accidents, poisoning, burns (inflammable and hot objects, incendiary-abrasive substances, etc.), electric shocks, lightning strikes, mechanical asphyxias, suicide attempts, possible torture, all deaths suspected to be associated with murder, suicide or accidents, and sudden and unexpected deaths are considered as forensic cases that should receive immediate attention and evaluation by the physician<sup>1-3</sup>. In addition to being a health problem affecting the young population, traumas cause serious loss of labor. After cancer and cardiovascular diseases, traumas are the third leading cause of death in all age groups, ranking first in the 1-44 years age group. According to the USA data, approximately 60 million trauma-related injuries occur annually, of which around 36 million (60%) present to emergency department<sup>4</sup>. The Turkish Statistical Institute (TUIK) reports that in Turkey, trauma and poisoning together constitute the fifth leading cause of death in all ages, and they are also the

most frequent causes of death for people aged 1 to 34 years. TUIK data also indicates a slight increase in traumatic death at all ages in Turkey from 2010 to 2012.

It has been shown that 25-50% of trauma-related deaths are preventable<sup>5</sup>. Trauma-related deaths are grouped into early and late periods. Post-traumatic deaths are usually caused by large vessel, cardiac and central nervous system injuries. Early post-traumatic deaths occur within minutes to an hour usually upon admission to hospital due to hemorrhagic shock, inadequate end-organ perfusion, serious central nervous system injuries, and cardiovascular collapse while late deaths are usually caused by sepsis and multi-organ failure within days or weeks after the event<sup>6</sup>. Trauma, which is an important reason for admission to the emergency department, is divided into blunt and penetrating groups, with the former being more common. In Turkey, blunt traumas are, in order of frequency, in-vehicle traffic accidents, extravehicular traffic accidents, falling from height, work accidents, and assault<sup>7</sup>. Penetrating traumas, on the other hand, cause more morbidity and mortality and are caused by penetrating injuries, blunt-penetrating injuries and gunshot wounds. In Turkey, the penetrating trauma type is seen at a rising fre-

quency with the increase in violence, and blunt-penetrating injuries are most common in the young population<sup>8</sup>. This study aimed to investigate the demographic and clinical characteristics of trauma-related mortality cases admitted to the emergency department.

## Materyal and Metod

This study retrospectively evaluated forensic cases with complete records of patients that were admitted to XXX Hospital Emergency Medicine Clinic between 15.06.2017 and 15.06.2019 and died. The cases were identified by screening the hospital police records and the hospital automated system. The demographic data of the cases, events leading to forensic cases, vital signs, Glasgow coma scale (GCS) score, revised trauma score, body area exposed to trauma, consultations requested, clinical, hemogram, platelet, lactate and blood ethanol levels, and the time from admission to the emergency department or hospital clinics to death were recorded. The mean, standard deviation, median lowest and highest, frequency and ratio values were used as the descriptive statistics. SPSS software version 22.0 was used for analysis.

## Results

In the current study, of the 72 forensic cases, 58 (80.6%) were male and 14 (19.4%) were female. The mean age was  $43.6 \pm 20.9$  years. The most and least frequent months of forensic

incidents were August (n = 11; 15.3%) and December (n = 3; 4.2%), respectively (Table 1). The mean GCS score of the patients was  $4.6 \pm 3.3$  at the time of presentation, while the mean revised trauma score was  $3.8 \pm 4.1$ . The mean systolic and diastolic blood pressure values were  $60.2 \pm 46.0$  and  $36.6 \pm 29.3$ , respectively, and the mean arterial pressure was  $45.0 \pm 34.7$  mmHg. At the time of presentation, the mean values for blood parameters were  $8.11 \pm 4.95$  g/dl for hemoglobin,  $175.3 \pm 83.3 \cdot 10^9/L$  for platelet count, and  $8.7 \pm 5.7$  mmol/L for lactate. Fifty-four cases (75%) were found to be ethanol-negative and 18<sup>25</sup> were ethanol-positive (Table 2).

The trauma mechanisms causing the forensic situation were extravehicular accidents in 18 patients (25%), fall from height in 17 (23.6%), firearm injuries in 10 (13.9%), blunt-penetrating wounds in eight (11.1%), physical assault in five (6.9%), motorcycle accidents in five (6.9%), in-vehicle traffic accidents in four (5.6%), hanging in three (4.2%), and being crushed under a heavy object in two (2.8%) (Figure 1).

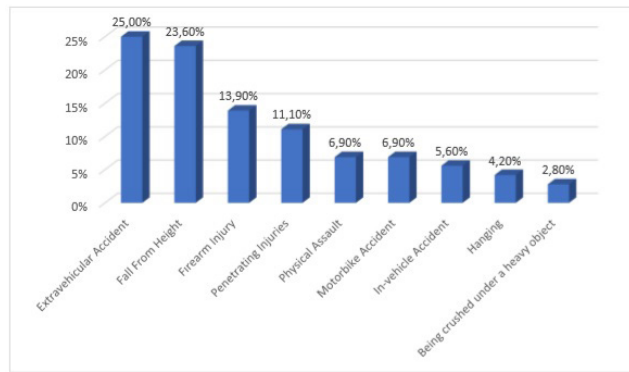
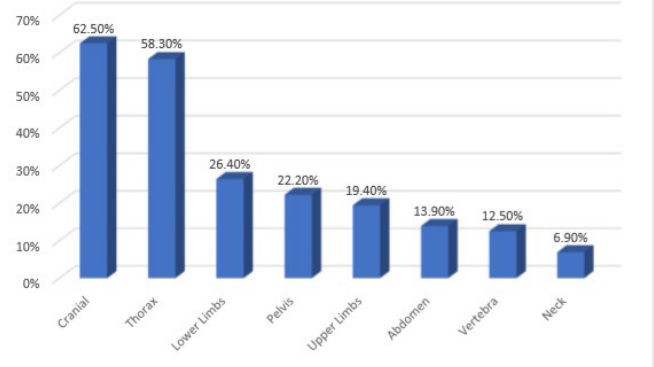
The most common part of the body affected by trauma was the cranial region (n = 45; 62.5%), followed by the thorax (n = 42; 58.3%), lower extremities (n = 19; 26.4%), pelvis (n = 16; 22.2%), upper extremities (n = 14; 19.4%), abdomen (n = 10; 13.9%), and vertebra (n = 9; 12.5%), and the least affected area was the neck (n = 5; 6.9%). Of the forensic cases that presented to the emergency department, 46 died in this department (63.9%) and 26 (36.1%) died in the clinic to which they had been admitted (Figure 2).

The presence/absence of surgical operations or procedures prior to death was also investigated, and 48 (66.7%) patients did not undergo any operation while 24 (33.3%) cases underwent surgery in various clinics before they died. Types of procedures were brain surgery in 13 patients

**Table 1:** Patients' age, gender, and month of presentation to hospital

	Min-Max	Median	Mean±SD n-%
Age	2.0 - 90.0	39.5	43.6 ± 20.9
Gender	Female		14 19.4%
	Male		58 80.6%
Month	January		4 5.6%
	February		5 6.9%
	March		4 5.6%
	April		8 11.1%
	May		5 6.9%
	June		10 13.9%
	July		10 13.9%
	August		11 15.3%
	September		7 9.7%
	October		1 1.4%
	November		4 5.6%
	December		3 4.2%

SD: standard deviation

**Figure 1:** Trauma mechanism**Figure 2:** Body part affected by the trauma**Table 2:** Trauma scores, vital parameters, laboratory values and ethanol test results of the patients

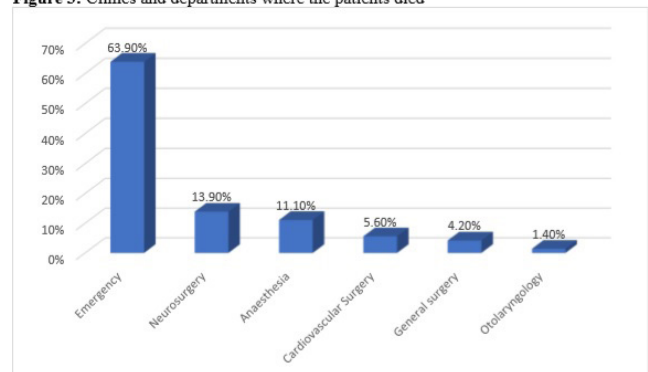
Glasgow Coma Scale Score	3.0	-	15.0	3.0	4.6	±	3.3
Revised Trauma Score	0.0	-	12.0	2.0	3.8	±	4.1
Respiratory Rate	0.0	-	30.0	0.0	4.4	±	8.1
Systolic Blood Pressure (mmHg)	0.0	-	170.0	60.0	60.2	±	46.0
Diastolic Blood Pressure (mmHg)	0.0	-	100.0	40.0	36.6	±	29.3
Mean Arterial Pressure (mmHg)	0.0	-	123.0	47.0	45.0	±	34.7
Pulse per minute	0.0	-	2.0	1.0	0.8	±	0.8
Hemoglobin g/dl	6.0	-	151.0	90.5	81.1	±	49.5
Platelet 10 <sup>9</sup> /L	40.0	-	370.0	158.5	175.3	±	83.3
Lactate mmol/L	1.0	-	29.0	8.0	8.7	±	5.7
Ethanol	(-)				54		75.0%
	(+)				18		25.0%

(18.1%), general surgery in three (4.2%), cardiovascular surgery (CVS) in three (4.2%), otolaryngologic surgery in two (2.8%), plastic surgery in one (1.4%), and anesthesia in one (1.4%). In terms of consultations, 28 patients died before other departments were consulted whereas 44 patients were referred to various clinics for a consultation, with most requiring more than one consultation. The consulted clinics and units were anesthesia and reanimation in 33 cases (45.8%), general surgery in 27 (37.5%), brain surgery in 24 (33.3%), orthopedics in 20 (27.8%), CVS in 10 (13.9%), urology in eight (11.1%), pediatric surgery in three (4.2%), and plastic surgery in one (1.4%). The mean time from admission to death was calculated as  $3.7 \pm 17.9$  days (Table 3).

In terms of where the death occurred, it was mostly the emergency department to which the patients first presented to (n = 46; 63.9%). This was followed by brain surgery (n = 10; 13.9%), anesthesia and reanimation (n = 8; 11.1%), CVS (n = 4; 5.6%), general surgery (n = 3; 4.2%), and otolaryngology (n = 1; 1.4%) (Figure 3).

## Discussion

Since the emergency departments of health institutions are one of the first units authorized about forensic cases, they

**Figure 3:** Clinics and departments where the patients died

play an important role in the detection of these cases. In this study, we planned to analyze forensic cases that resulted in death. Trauma is still one of the most important causes of morbidity and mortality throughout the world. Globally, the incidence of trauma-related mortality is known to be 56/100,000<sup>9</sup>. According to the 2007 TUIK data, in Turkey, 26% of the deaths that occurred due to motor vehicle accidents belonged to the 20-55 age group, and 74% were seen in men<sup>5</sup>. In a study evaluating trauma-related deaths, Avcı et al. reported that 76.2% of the patients were male, and the mean age was  $48.9 \pm 20$  years<sup>10</sup>. In a study by Angela et al., the male population constituted 79% of the sample, and the

**Table 3:** Details of operations performed, consultations requested, and day of death

	Min-Max	Median	Mean±SD/n-%
Operating department	(-) No operation	48	66.7
	(+) Operated	24	33.3
	Anesthesia	1	1.4
	Brain surgery	13	18.1
	General surgery	3	4.2
	Cardiovascular surgery	3	4.2
	Orthopedics	1	1.4
	Otolaryngology	2	2.8
	Plastic surgery	1	1.4
Consultation request	(-) Not requested	28	38.9
	(+) Requested	44	61.1
	Brain surgery	24	33.3
	General surgery	27	37.5
	Orthopedics	20	27.8
	Cardiovascular surgery	10	13.9
	Anesthesia	33	45.8
	Otolaryngology	3	4.2
	Urology	8	11.1
	Plastic surgery	1	1.4
	Pediatric surgery	3	4.2
	Thoracic surgery	6	8.3
	Day of Death (from first presentation)	0.0 - 150.0	0.0

SD: standard deviation

mean age was calculated as  $36.8 \pm 1.2$  years. Two studies were conducted in the same trauma center in two different years and it was found that trauma-related deaths were seen in men at a rate of 73% in 1992 and 70%, and the mean age was 41.7 and 47.3 years, respectively<sup>11-12</sup>. In the current study, 58 of the cases (80.6%) were male, and the mean age was  $43.6 \pm 20.9$  years, similar to the literature. The high incidence of forensic incidents in men and the young age group may be due to their higher presence in traffic, working at high-risk jobs, aggressive nature, and higher rate of alcohol use.

In a study conducted by Varol et al., the highest accident rate was observed in August at 17.9%. The higher incidence of traffic accidents in summer months is consistent with the literature<sup>13</sup>. In our study, forensic trauma was most frequent in August, involving 11 cases (15.3%). The least number of presentations related to forensic trauma was in December (n = 3; 4.2%). Concerning the evaluation of trauma scores, Avcı et al. reported the GCS score as  $5.11 \pm 4.10$  and the revised trauma score as  $5.874 \pm 1.849$  while determined that the former was  $\leq 8$  in 60.3% of the patients and the mean value of the latter was  $5.24 \pm 2.05$ <sup>14</sup>. In the current study, the mean GCS score of the patients at the time of presen-

tation was  $4.6 \pm 3.3$ , and the revised trauma score was  $3.8 \pm 4.1$ . In previous studies, the mean systolic blood pressure at the time of presentation was reported to be  $42.95 \pm 59.34$  mmHg<sup>10</sup> and below 90 mm Hg in 37.6% of the cases<sup>14</sup>. We calculated the systolic blood pressure as  $60.2 \pm 46.0$ , diastolic blood pressure as  $36.6 \pm 29.3$  and arterial pressure as  $45.0 \pm 34.7$  mmHg.

Cothren et al. reported that traumatic deaths due to blunt trauma that occurred within 24 hours of presentation in the same trauma center in 1992 and 2002 were at the rates of 56% and 74%, respectively, and the most common cause was motor vehicle accident for both years<sup>12</sup>. In their case series, Avcı et al. found that 85% of the patients were injured due to isolated blunt trauma and 45.8% of these cases had been involved in an extravehicular traffic accident<sup>10</sup>. Similarly, Trajano et al. reported these accidents as the most common cause of traumatic death<sup>14</sup>. Seviner et al. evaluated the causes of death in forensic incidents and found traffic accidents to rank first (27.3% of cases)<sup>15</sup>. In our study, we also demonstrated that the most common trauma mechanism resulting in death was extravehicular traffic accidents involving a total of 18 patients (25%). Seviner et al. noted that the most frequently injured body part was the extremi-

ties in forensic cases at a rate of 41%, and 27% of the sample presented with multiple system injuries<sup>15</sup>. In two other studies, head and neck injuries were reported in 44.6%<sup>17</sup> and 21%<sup>18</sup> of forensic cases, and extremity injuries in 18.8% and 72%, respectively. In our study, the most commonly affected body region was cranial (n = 45; 62.5%), and the least affected area was the neck (n = 5; 6.9%). The higher rate of head trauma in our series may be due to our hospital being a special trauma center to which specific and severe trauma cases are referred by the 112-emergency ambulance service.

Avcı et al. observed head and neck injuries in 71 patients that went into cardiac arrest and 43 patients without cardiac arrest<sup>10</sup>. Arslan et al. reported that the most common cause of trauma-related deaths was traumatic brain injury<sup>19</sup>. Evans et al. revealed that the most common causes of death due to high-energy trauma were central nervous system injuries (33%) and hemorrhage (33%)<sup>20</sup>. Similarly, according to our results, 46 patients (63.9%) died in A&E. Of the patients that did not die in the emergency service and underwent surgery in other clinics, 13 (18.1%) had been referred to the brain surgery, followed by three (4.2%) referred to general surgery. These results are consistent with the literature. In our series, 28 patients died at the emergency department before consultation. During follow-up in the emergency department, various clinics were consulted for 44 patients, of whom most required more than one consultation. The departments from the highest to the lowest rate of consultation were anesthesia and reanimation (n = 33; 45.8%), general surgery (n = 27; 37.5%), brain surgery (n = 24; 33.3%), orthopedics (n = 20; 27.8%), CVS (n = 10; 13%), urology (n = 8; 11.1%), pediatric surgery (n = 3; 4.2%), and plastic surgery (n = 1; 1.4%).

In the series examined by Avcı et al., 100 cases (46.7%) were evaluated as pre-hospital death in the group of patients that did not respond to arrest and cardiopulmonary resuscitation<sup>10</sup>. Arslan et al. reported 38% pre-hospital deaths associated with trauma<sup>19</sup>. Evans et al. showed that 66% of deaths due to high-energy trauma occurred before presentation to hospital<sup>20</sup>. In the current study, in terms of where the deaths occurred, more than half of the patients (n = 46; 63.9%) died at the emergency department where they were first admitted, and 26 (36.1%) patients died in other departments after their hospitalization, with the least number of deaths being seen in the otolaryngology clinic (n = 1; 1.4%). Concerning the time to mortality, Avcı et al. determined that 11 of the patients that did not have cardiac arrest died within the first hour, 25 in one to three hours, 18 in three to six hours, eight in six to 12 hours, and three in 12 to 24 hours<sup>10</sup>. Gunst et al. reported that 84% of early deaths due to trauma occurred within the first 12 hours<sup>21</sup>, and Hamzeh et al. revealed that most post-traumatic deaths occurred within the first hour<sup>22</sup>. In our study, the day of death was found to range from 0 to 150 days, with the mean time to death being statistically calculated as  $3.7 \pm 17.9$  days.

When studies investigating the relationship between trauma and drinking and driving were examined, it was found that in a study evaluating traffic accident cases, 46.8% of the drivers had consumed alcohol, and similarly, another study found that 32% of drivers injured in a traffic accident had at least 0.1% blood alcohol concentration and that the rate of accidents involving patients that drank and drove was 2.6 times higher compared to those that did not drink and drive<sup>23</sup>. In the current study, 54 cases (75%) were found to be ethanol-negative and 18 (25%) were ethanol-positive. However, we analyzed ethanol positivity/negativity in all trauma cases. In another study, Baydın et al. showed that the lactate level was associated with the severity of trauma and mortality<sup>24</sup>. In our cases, the lactate value at the time of presentation was found to be high at  $8.7 \pm 5.7$  mmol/L, and this was associated with mortality.

## Conclusion

Emergency services constitute the most important step in patients presenting to the hospital due to traumatic forensic causes. As revealed by our study, a large percentage of the trauma-related deaths occurred at the emergency department. In addition, especially in patients requiring consultation with multiple clinics, the emergency department acts as a bridge and a link between all the hospital services. Determining the time and location of deaths indicates where to focus on to improve our knowledge of trauma. The most important way of reducing trauma-related deaths remains to be prevention. We also need to continue research to improve our knowledge of trauma management. In addition, ensure that forensic reports are properly completed is one of the main tasks of reporting life-threatening situations.

**Ethics Committee Approval:** The study was conducted in accordance with the principles of the Declaration of Helsinki and Ethical Board approved the study protocol. (17/12/2019-1375)

**Informed Consent:** Due to the retrospective design of the study, informed consent was not taken.

**Conflict of Interests:** The authors have no conflict of interests to declare.

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# Incidental Cavernous Angioma

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## Abstract

**Introduction:** Besides developmental venous anomaly (DVA), arteriovenous malformation (AVM) and capillary telangiectasia, cavernomas are one of the vascular malformations of the central nervous system. In this case report, we present a case diagnosed with cavernous angioma in the left posterior frontal region, who presented to our emergency department with the complaint of numbness in her left hand.

**Case:** A 38-year-old male patient was admitted to the emergency department with complaints of numbness in his left hand in the last few days. Brain CT examination showed a left sided hyperdensity at the level of vertex, which was suspected of hemorrhage. Afterwards, unenhanced and contrast-enhanced MRI scans of the brain revealed an image, which was considered primarily as hemorrhagic cavernous angioma, showed minimally heterogeneous intravenous contrast enhancement, hyperintense on T1-weighted images and heterogeneously hyperintense on T2-weighted images, and measured approximately 11 mm in size in the left posterior frontal region at high ventricular level. The patient was consulted to neurology and neurosurgery departments, and was hospitalized in the neurosurgery service.

**Discussion:** Cavernomas are the third most common vascular malformations after developmental venous anomaly and capillary telangiectasias, accounting for 5-13% of all cerebral vascular malformations. Cavernous angiomas can be seen in any area of the central nervous system (CNS), mostly in cerebral hemispheres (80%). They are most commonly located in the subcortical region and frontal-temporal lobes in the cerebral parenchyma. The most common clinical symptoms include epileptic seizures, intracerebral hemorrhage, focal neurological symptoms and headache. Magnetic resonance imaging is the most sensitive radiological diagnostic method for cavernous angiomas. Asymptomatic cases of cavernous angiomas are followed by periodic MRI studies, surgical resection of the lesions is recommended because recurrent hemorrhages may cause permanent neurological deficits in symptomatic patients.

**Conclusion:** In conclusion, patients with cavernoma present with atypical complaints to the emergency department and can be diagnosed incidentally. Cavernomas are lesions of vascular origin, which tends to be located more frequently in the frontotemporal lobes and subcortical areas, is often accompanied by developmental venous anomalies, and has a radiological appearance that varies according to the extent of hemorrhage.

**Keywords:** Numbness in the left arm, intracranial mass

## Introduction

Besides developmental venous anomaly (DVA), arteriovenous malformation (AVM) and capillary telangiectasia, cavernomas are one of the vascular malformations of the central nervous system<sup>1</sup>. The incidence of cavernomas is approximately 0.5% in autopsy series and 0.7% in magnetic resonance imaging (MRI) studies<sup>1,2,3</sup>. Cavernomas are frequently asymptomatic lesions usually incidentally detected in brain imaging studies for unrelated reasons, but may also lead to headache, epileptic seizures and stroke-like symptoms<sup>1</sup>. In this case report, we present a case diagnosed with cavernous angioma in the left posterior frontal region, who presented to our emergency department with the complaint of numbness in her left hand.

## Case

A 38-year-old male patient was admitted to the emergency department with complaints of numbness in his left hand in the last few days. He had a history of hypertension. Vital parameters were as follows: body temperature, 36°C; heart rate, 72 beats per minute; breathing rate, 18 breaths per minute; and blood pressure, 130/70 mmHg. The (ECG) examination showed normal sinus rhythm with a troponin level within the normal reference range. His neurological examination was normal and showed no neurological deficits. Brain CT examination showed a left sided hyperdensity at the level of vertex, which was suspected of hemorrhage (Figure-1). Afterwards, unenhanced and contrast-enhanced MRI scans of the brain revealed an image, which was considered pri-

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marily as hemorrhagic cavernous angioma, showed minimally heterogeneous intravenous contrast enhancement, hyperintense on T1-weighted images and heterogeneously hyperintense on T2-weighted images, and measured approximately 11 mm in size in the left posterior frontal region at high ventricular level (Figure 2). The patient was consulted to neurology and neurosurgery departments, and was hospitalized in the neurosurgery service.

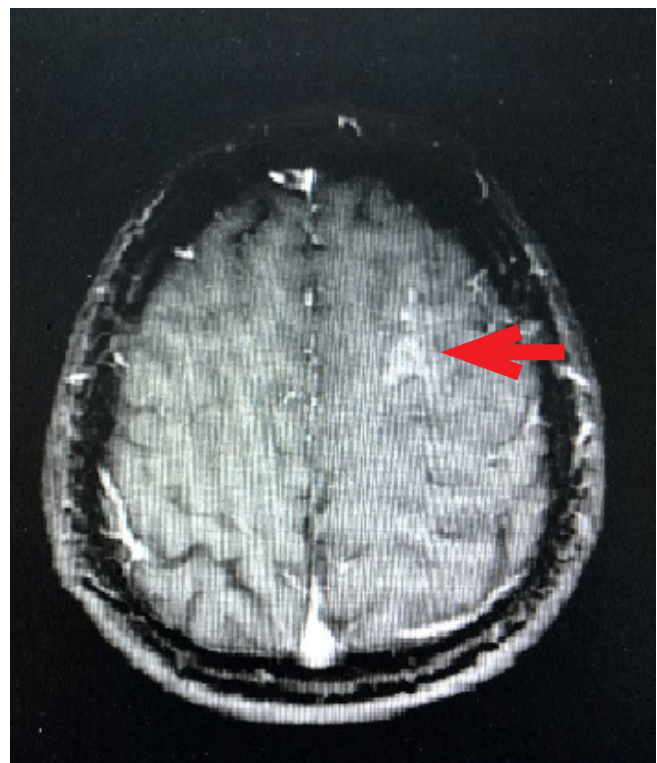


**Figure 1:** Brain CT examination showed a left sided hyperdensity at the level of vertex, which was suspected of hemorrhage.

## Discussion

Cavernomas are the third most common vascular malformations after developmental venous anomaly and capillary telangiectasias, accounting for 5-13% of all cerebral vascular malformations<sup>1,4,5</sup>. Although cavernomas are considered rare lesions when first discovered, they were increasingly detected in neuroradiological examinations, especially after advances in MRI studies<sup>1</sup>. There are two types, including sporadic and familial cavernomas. The sporadic lesions are single, whereas the number of familial lesions is more than one. Familial forms of cavernomas show autosomal dominant inheritance<sup>6</sup>. The differential diagnosis of multiple cavernous angiomas should include the foci of hypertensive hemorrhages, amyloid angiopathy, and capillary telangiectasia. Patients with hypertensive hemorrhage have a long history of hypertension<sup>7</sup>. Our case also had a history of hypertension.

Cavernous angiomas can be seen in any area of the central nervous system (CNS), mostly in cerebral hemispheres (80%). They are most commonly located in the subcortical region and frontal-temporal lobes in the cerebral parenchyma. Infratentorial involvement is rarely seen, although they may show involvement on both sides of the tentorium<sup>8,9</sup>. Although the pons is the most common site of involvement in the brainstem, extraaxial involvement has been identified, albeit rare-



**Figure 2:** MRI scans of the brain revealing an image, which was considered primarily as hemorrhagic cavernous angioma, showed minimally heterogeneous intravenous contrast enhancement, hyperintense on T1-weighted images and heterogeneously hyperintense on T2-weighted images, and measured approximately 11 mm in size in the left posterior frontal region at high ventricular level



ly. Spinal involvement is usually seen in the epidural space, whereas intramedullary involvement is rather rare.

Symptoms and symptoms in cavernous angiomas vary depending on the extent of hemorrhage and the size and location of the lesion. If thrombosis develops in the cerebral lesion, they may cause infarction. The most common clinical symptoms include epileptic seizures, intracerebral hemorrhage, focal neurological symptoms and headache. Literature review showed that 50-60% of the patients with cavernous angioma present with epileptic seizures, 30% with focal neurological deficits and 25% with headache. Approximately 20% of cases present with hemorrhage. In addition, they may rarely cause subarachnoid hemorrhage. Cavernous angiomas also predispose to stroke and epileptic seizures throughout life. The incidence of re-hemorrhage in cavernous angiomas has been reported as 20 to 80% for weeks to years (10).

CT examination of cavernous angiomas shows well-demarcated focal hyperdense lesions, with and without mass effect or edema. They show little or no contrast enhancement. Magnetic resonance imaging is the most sensitive radiological diagnostic method for cavernous angiomas. Cavernous angiomas are usually 1 to 2 cm in size (11). The treatment strategy of cavernous angiomas varies according to whether the lesion is symptomatic or not. If brain MRI detects an incidental asymptomatic cavernous angioma, a conservative approach is followed and annual MRI studies are performed. Asymptomatic cases of cavernous angiomas are followed by periodic MRI studies, surgical resection of the lesions is recommended because recurrent hemorrhages may cause permanent neurological deficits in symptomatic patients.

## Conclusion

In conclusion, patients with cavernoma present with atypical complaints to the emergency department and can be

diagnosed incidentally. Cavernomas are lesions of vascular origin, which tends to be located more frequently in the frontotemporal lobes and subcortical areas, is often accompanied by developmental venous anomalies, and has a radiological appearance that varies according to the extent of hemorrhage.

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