

ISSN: 2651-4311

VOLUME CİLT: 6 ISSUE SAYI: 3 YEAR YIL: 2023

ANATOLIAN

JOURNAL OF EMERGENCY MEDICINE
ANADOLU ACİL TIP DERGİSİ

TATD
Emergency Medicine Association of Turkey

TÜRKİYE
ACİL TIP
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Issued by The Emergency Medicine Association Of Turkey
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Conservative Treatment of Mildly Symptomatic Large Extradural Hematomas in The Pediatric Age Group: A Report of 20 Cases

Pedriatrik Yaş Grubunda Hafif Semptomatik Büyük Ekstradural Hematomların Konservatif Tedavisi: 20 Vaka Serisi

Rıfat Akdağ¹, Uğur Soylu¹

ABSTRACT

Aim: Conservative treatment is a safe alternative to surgical treatment in patients with asymptomatic or mildly symptomatic extradural hematoma seen in the pediatric age group. There is still a debate about patient selection criterias. This study highlights the radiological and clinical features of pediatric large EDH patients treated without surgery.

Material and Methods: In this retrospective-cohort study, we present a review of the data of 20 pediatric EDH patients treated in Health Sciences University, Bursa Yüksek İhtisas Training and Research Hospital between 2015 and 2020. This study; includes patients with Glasgow Coma Scale (GCS) 14+ and diagnosed EDH thickness \geq 15mm in computed tomography (CT), treatment protocol and outcomes.

Results: Of the 206 patients diagnosed with EDH, 131 (63,5 %) had an initial GCS \geq 14. Furthermore, 23 (11,1 %) patients had EDH thickness \geq 15 mm. 3 patients were excluded from study because of emergent surgery. The number of patients included in the study was 20 and all patients had a GOS score of 5 on at least one -year follow-up.

Conclusion: According to our results, conservative treatment is an optimal alternative to surgical treatment in pediatric large EDH patients. However, patient selection and clinical features are very important.

Keywords: Epidural hematoma, conservative management, head trauma, pediatric patients, traumatic brain injury

Öz

Amaç: Pedriatrik yaş grubunda görülen asemptomatik veya hafif semptomatik ekstradural hematoma olan hastalarda konservatif tedavi cerrahi tedaviye güvenli bir alternatiftir. Hasta seçim kriterleri hakkında hala bir tartışma vardır. Bu çalışma, ameliyatsız tedavi edilen pedriatrik büyük EDH hastalarının radyolojik ve klinik özelliklerini vurgulamaktadır.

Gereç ve Yöntemler: Bu retrospektif-kohort çalışmada, Sağlık Bilimleri Üniversitesi Bursa Yüksek İhtisas Eğitim ve Araştırma Hastanesi'nde 2015-2020 yılları arasında tedavi gören 20 pedriatrik EDH hastasının verilerinin bir derlemesini sunuyoruz. Bu çalışma; Glasgow Koma Skalası (GCS) 14+ olan ve bilgisayarlı tomografide (BT) EDH kalınlığı \geq 15 mm olan hastaları, tedavi protokolünü ve sonuçlarını içermektedir.

Bulgular: EDH tanısı konan 206 hastanın 131'inde (%63,5) başlangıç GCS \geq 14 idi. Ayrıca 23'ünde (%11,1) EDH kalınlığı \geq 15 mm idi. Acil cerrahi nedeniyle 3 hasta çalışma dışı bırakıldı. Çalışmaya dahil edilen hasta sayısı 20 idi ve tüm hastaların en az bir yıllık takipte GOS skoru 5 idi.

Sonuç: Sonuçlarımıza göre, pedriatrik büyük EDH hastalarında konservatif tedavi cerrahi tedaviye optimal bir alternatiftir. Ancak hasta seçimi ve klinik özellikler çok önemlidir.

Anahtar Kelimeler: Epidural Hematom, konservatif tedavi, kafa travması, çocuk hasta, travmatik beyin hasarı

Received: May 5, 2022

Accepted: May3, 2023

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Atif için/Cited as: Akdag R, Soylu U. Conservative Treatment of Mildly Symptomatic Large Extradural Hematomas In The Pediatric Age Group: A Report of 20 Cases. Anatolian J Emerg Med 2023;6(3):98-104. <https://doi.org/10.54996/anatolianjem.1112749>

Introduction

Extradural hematoma (EDH) is a neurosurgical emergency that typically occurs following a trauma. The timing of treatment is critical because if it is not treated, it can result in herniation syndromes due to an acute increase in intracranial pressure (1). Early treatment is also critical for lowering morbidity and mortality (2). According to their guidelines, surgical decompressive craniectomy or craniectomy should be performed within four hours of the onset of significant symptoms to achieve a good outcome (3,9). Although the arteries injured in EDH vary, the middle meningeal artery is usually injured in trauma. Additionally, the sinuses (superior sagittal sinus or lateral sinus) and diploic vein may be the source of the bleeding. The majority of pediatric extradural hematomas (PEDH) are caused by venous sources. Because the majority of PEDH comes from venous sources, the slow expansion of bleeding causes premature clotting. As a result, PEDHs are better suited for non-surgical treatment than EDHs from the arterial system (3).

EDH is common in both pediatric and adults' populations. PEDH is thought to be responsible for 2–4, 5% of all pediatric traumatic brain injury (4). In symptomatic patients with diagnosed PEDH, urgent craniotomy for evacuation of blood clot evacuation is the standard treatment for quick and complete recovery (5). Late diagnosis and treatment of symptomatic PEDH raise morbidity and mortality rates comparable to those seen in adults. Previous research has suggested that in patients with asymptomatic PEDH, conservative management with close neurological monitoring and serial computed tomography (CT) may be a safe alternative to craniotomy (5,7).

The goal of our study was to show clinically and radiologically that children with mildly symptomatic or asymptomatic large EDH can be treated conservatively. We also attempted to demonstrate that craniotomy can be protected from long-term socio-cultural and psychological consequences.

Material and Methods

This study looked at 206 patients who were admitted to the hospital with PEDH between May 2015 and June 2020 after institutional ethical approval (Date:08-01-2020, Decision No:2011-KAEK-25 2020/01-26). Only patients in the pediatric age group (less than 18 years old) traumatic EDH patients with a Glasgow Coma Skale (GCS) score of ≥ 14 were included in our study. Patients with no focal neurological findings but mild symptoms and signs of an increase in intracranial pressure (vomiting, headache etc.) were treated conservatively. We also included patients with EDH thicknesses less than ≥ 15 mm. Patients with PEDH who had surgery, patients with additional intracranial lesions (depression fracture, subdural hematoma, cerebral contusion, subarachnoid hemorrhage), patients with infratentorial EDH, patients with a Pediatric Trauma Score of less than 8, and patients with additional systemic disease (coagulopathy, kidney failure) were all excluded from the study. Patients who were unable to attend follow-up appointments were also excluded from the study. We presented 20 patients who were treated conservatively by this patient.

The age, gender, mechanism of injury, location and thickness of EDH, presence of skull fracture, change in EDH thickness, initial GCS score evaluation, hospital admission time, and treatment outcomes of patients were all evaluated descriptively. The Glasgow Outcome Scale (GOS) test was used to assess the patients' neurological recovery. At the 12-month follow-up, all patients' social and intellectual levels were assessed. All of the parents adhered to our PEDH treatment protocol. Table 1 summarizes the clinical features and management process of 20 patients.

All the eligible patients received non-surgical treatment and were followed up on in the neurosurgical intensive care unit (NSICU) for close neurological monitoring. An attending neurosurgeon, neurosurgery resident, or trained NSICU nurse performed hourly neurological examinations (deterioration of consciousness, vomiting). The patients were transferred to the neurosurgery service, where 24-hour neurosurgical control was available. Continuous neurological monitoring also included measuring the patients' pupil diameter, pulse rate, blood pressure, and respiratory patterns. In our study, if a patient's neurological condition worsened during their hospitalization, emergency surgery was available within 30 minutes.

Small PEDH patients who do not require surgery are routinely followed up on with additional CT imaging in the event of deterioration in their neurological conditions or clinical necessity (such as increasing recurrent projectile vomiting). A CT frequency protocol for monitoring large PEDH was developed in this study. CTs were performed on admission and on the eighth hour after the initial presentation (unless there was acute worsening in symptoms). Furthermore, those who had complaints like vomiting and headaches despite symptomatic treatment were given additional CT scans. Magnetic Resonance Imaging (MRI) has been preferred, particularly for long-term follow-ups, in order to reduce the number of CT scans due to potential radiation effects.

Radiological findings are reported in Table 2.

After discharge, all patients were followed up on in neurosurgery outpatient clinics at one-month, three-month, and twelve-month intervals. Furthermore, 6th month follow-up was performed if necessary (patients with residual hematoma/calcification on a 3rd month CT/MRI or presence of clinical necessity). Each visit included a thorough neurological examination. Furthermore, a standardized questionnaire was used to collect the parent's subjective opinion of the patient's quality of life.

Results

131 (63,5%) of the 206 patients diagnosed with PEDH had an initial GCS of ≥ 14 . PEDH thickness was ≥ 15 mm in 23 (11.1%) of the patients. Three patients were excluded from the study because they had undergone surgery following a sudden neurological deterioration. The study included the remaining 20 patients. Six (30%) of these patients were female, while 14 (70%) were male. The average age was $8,4 \pm 4,03$ years. The entire study group was made up of patients who were admitted to the hospital within ≤ 24 hours of being diagnosed with EDH. The average time between the patients' accident and hospitalization was $8,4 \pm 6,07$ hours.

11(55%) of the patients fell 1–2 meters. Four (20%) patients presented after being hit by a vehicle or being involved in an in-vehicle traffic accident. Other traffic accidents, such as a bicycle/skate accident that did not involve a motor vehicle, were reported by four (20%) patients. Only one patient (5%) presented after an assault (Table 1). All patients had an initial GCS of ≥ 14 . They all lacked focal neurological deficits. Pupil responses, breathing patterns, and blood pressures were all normal. The most common symptoms in the study group were mild-to-moderate headaches, vomiting, and irritability. Ten (50%) of the patients had left-sided EDH, while the remaining ten (50%) had right-sided EDH. The average shift in the midline was $2,54 \pm 2,1$ mm. The average thickness of PEDH was $18,1 \pm 3,3$ mm. The parietal area was the most affected area in our study (Figure 1,3), nine patients (45%). PEDH was found in the frontal region in seven patients (35%) (Figure 2). PEDH was found in the temporal regions in three patients (15%). Only one patient (5% of the total) had PEDH in the occipital region. PEDH showed multilobar localization in eight patients (40%), which was a remarkable radiological feature in our series. In our study, 14 patients (70%) had a skull fracture. Repeated CT revealed an increase in PEDH thickness in six patients (30%) and a decrease in PEDH thickness in two patients (10%). The average increase was $3,1 \pm 0,9$ mm, while the average decrease was $4,5 \pm 0,5$ mm. In addition, all six patients with increased hemorrhage had skull fractures. There were five parietal bone fractures and one frontal bone fractures, and there was no sinus adjacency (Table 2). There was no change in any of the patients' midline shift. The other 12 patients had no change in PEDH thickness. An extra emergent CT was performed on eight patients (40%), who had increased headaches, vomiting, and irritability. In 17 patients, the last CT performed three months later revealed complete resolution of PEDH with no additional pathology. At the three-month follow-up, three patients had residual PEDH or dural calcification (Figure 2). An extra CT/MR was performed on these patients at the 6th month follow-up and control CTs revealed complete resorption. Ten patients (50%) had additional CT scans. As a result, we kept the number of CTs to a minimum, and the patients were monitored with neurological examinations at regular intervals. MRI was used to perform long-term follow-up of 9 (45%) patients. When the patients were discharged, their parents were educated on emergencies and given strict return-to-hospital precautions in the event of a worsening neurological status. Patients were summoned to the hospital on a regular bases for a check-up. MRI was used in the follow-up of 9 (45%) of the patients. All patients received a GOS of 5 during their yearly follow-up visit. All of the patients had returned to their pre-accident social and cognitive levels. Except for two patients (4th and 17th in Table 1) who had occasional headaches that did not require significant medical treatment, all patients had no additional symptoms. The PEDH conservative treatment protocol has been approved by all parents (Table 3). No other signs or symptoms, seizures, or antiepileptic drugs were required in any of our patients.

Discussion

Conservative treatment may be a safe alternative to surgical treatment in children with asymptomatic or mildly

symptomatic EDH. Neurosurgeons were hesitant to operate on patients with mildly symptomatic PEDH, according to the literature (12). Patients with neurological impairment, whose neurological status worsens after the first clear interval, or who are in a coma after the accident are generally operated on (6); Chen et al recommend that EDH with a hematoma volume greater than 30 ml and a midline deviation of more than 5 mm be drained by craniotomy (13). Similarly, Bejjani et al. advised surgery if the hematoma thickness was greater than 18 mm and the midline deviation was greater than 4 mm (14,15). Many multi-patient, multi-center studies have shown that patients in all age groups with EDH thickness less than 10 mm can be followed with conservative treatment (15). Furthermore, despite having fewer patients, it has been demonstrated that patients with EDH greater than 10 mm can be followed with conservative treatment, particularly in the age group (16,17). Conservative management can be more successful in pediatric EDH than in adults due to the flexible skull, non-fused suture lines, fontanelle patency, large extra-cerebral spaces, and bleeding that is usually of venous origin (3,16). Another critical consideration is determining CT repetition intervals. Because of the potential long-term effects of excessive radiation on the developing brain, thyroid, and hematopoietic system, serial imaging in the pediatric age group is controversial (11). According to the current guidelines, the lifetime cancer risk of CT applied to a one-year-old child is as high as 1 in 150029. Previous research has suggested that there may be an increase in the thickness of EDH within 36 hours, so a follow-up CT within 36 hours is advised (18,21). Furthermore, it has been demonstrated in the literature that hemorrhage can develop within 8 hours of the accident (17,22). The average time to first CT imaging in our six patients with increased hematoma was 6 hours (2–12 h). It is critical to carefully justify pediatric CT scans. To reduce risks, methods such as dose optimization (under 10 mGy) and MRI control are required. In our study, MRI was used in 9(45%) of the patients, particularly for their third month and later controls.

In general, one of the most important factors that will guide treatment is the duration of the patient's symptoms. Previous research has found that the first 24 hours are the most dangerous for neurological deterioration due to traumatic EDH expansion, which occurs in 23% of EDH patients eight hours after the accident (16,21). Patients diagnosed with EDH less than 6 hours after trauma face a high risk of neurological deterioration, necessitating evacuation (10,22). Patients diagnosed later can be treated conservatively because the risk of delayed neurological deterioration is low (19,20). Patients with delayed onset or late admission were chosen for conservative treatment in a previous study (23,24). According to Balmer et al. the only selection criterion for conservative treatment in patients with large EDH is late admission (more than 24 hours) (16). Champagne et al and Khan et al. The mean time to referral in articles containing similar patient groups was reported to be 29.5 hours and 13.9 hours, respectively (5,7). All patients in our series were seen within the first 24 hours of being injured. The average time from the accident to hospital admission in this study was 8.4 ± 6.07 hours.

Patient No	Sex	Age (y)	Mechanism of injury	Time from accident to admission(h)	Initial GCS	EDH Size, (mm)	EDH size increase/decrease (in repeat CT scans)
1	M	8	Falling	6	15	17	Increase
2	M	16	Assault	4	14	19	Stable
3	F	4	Falling	8	15	16	Stable
4	M	10	MVA	2	15	22	Stable
5	M	7	Falling	2	15	15	Increase
6	M	10	Falling	16	15	18	Decrease
7	M	9	Non-MVA-b RA	8	15	17	Stable
8	M	10	Falling	6	15	15	Increase
9	F	6	Falling	2	15	16	Stable
10	F	8	Non-MVA-b RA	12	15	16	Increase
11	F	5	MVA	2	15	17	Increase
12	F	4	Falling	12	14	16	Stable
13	M	15	MVA	2	14	20	Stable
14	M	7	Non-MVA-b, RA	12	15	18	Decrease
15	M	14	Falling	8	15	15	Increase
16	M	8	MVA	2	15	16	Stable
17	F	5	Non-MVA-b RA	24	15	29	Stable
18	M	15	Falling	12	15	22	Stable
19	M	2	Falling	12	15	20	Stable
20	M	5	Falling	16	15	18	Stable

M: Male, F: Female, GCS: Glasgow Coma Scale, CT: Computed Tomography, EDH: Extradural hematoma, MVA-B: Motor vehicle accident- bicycle RA:Road accident

Table 1. Presenting clinical features, management process of 20 patients.

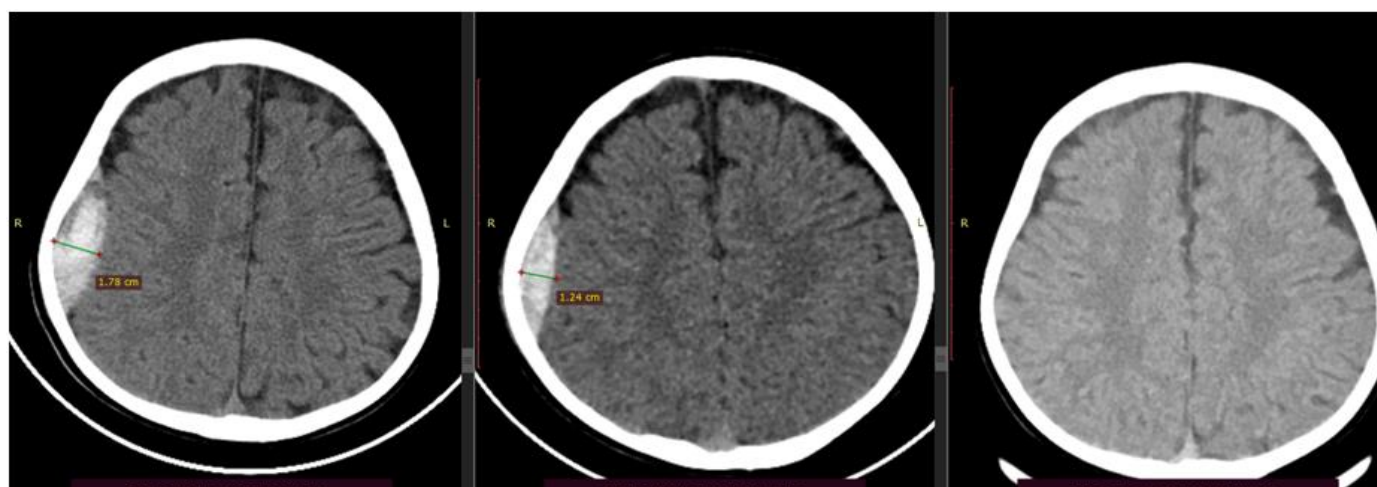


Figure 1: Axial CT scan of a 7-year-old male patient (Patient 14, table 1) shows a right parietal PEDH 18mm in thickness (A). Axial CT scan of the same patient taken 72 hours later shows a little decrease (5 mm) from the earlier scan (B). Axial CT scan of the same patient taken 3 months after discharge demonstrates marked resolution of the EDH (C).

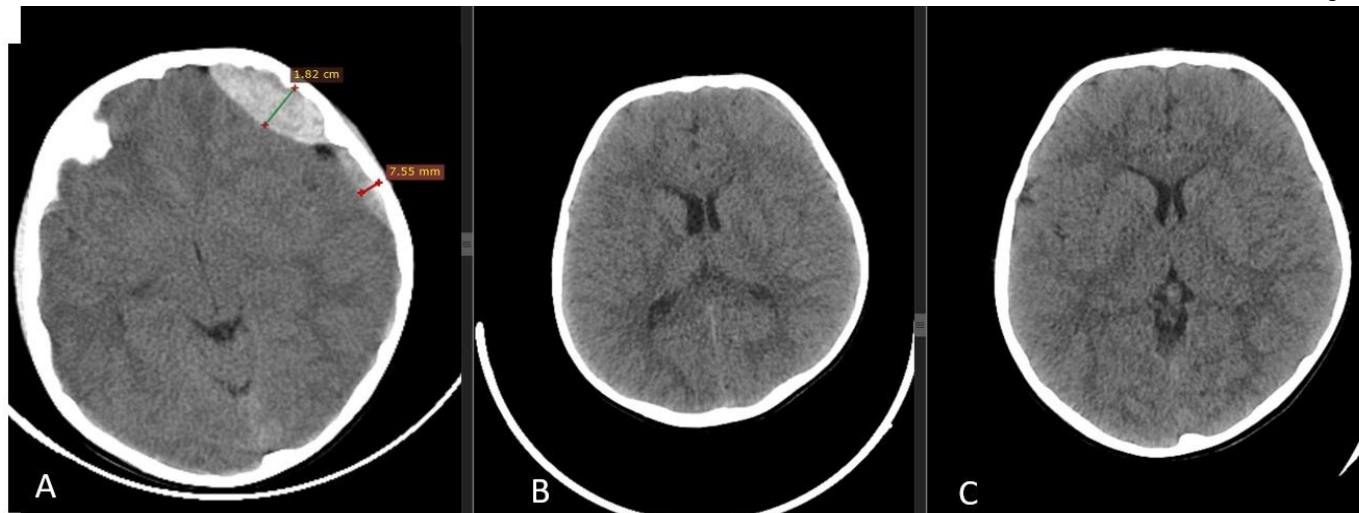


Figure 2: A 5-year-old male patient (Patient 20, table 1) was brought to the emergency department after a fall from a height of 2 meters. Axial CT scan shows a left frontal 18mm and temporal 7mm in thickness multilobar PEDH (A). Axial CT scan of the same patient taken 3 months after discharge demonstrated marked resolution of the EDH. But, some residual dural calcification was observed (B). Axial CT scan of the same patient taken 6 months after discharge showed that total resorbed (C).

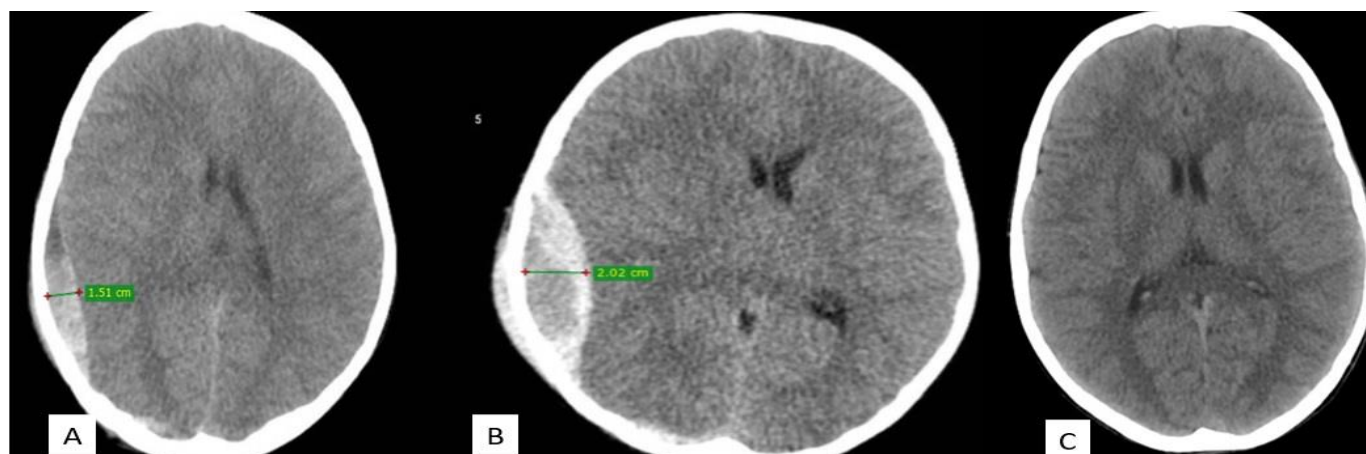


Figure 3: Axial CT scan of a 7-year-old male patient (Patient 5, Table 1) shows a right parietal PEDH 15 mm in thickness (A). Axial CT scan of the same patient taken 72 hours later shows a little increase (5 mm) from the earlier scan (B). Axial CT scan of the same patient taken 3 months after discharge demonstrates marked resolution of the EDH.

Radiologic Findings		Number (%)
Localisation	Frontal predominance	7 (35%)
	Temporal predominance	3 (15%)
	Parietal predominance	9 (45%)
	Occipital predominance	1 (5%)
	Multilobed	8 (40%)
Mean thickness of EDH, mm (range)		18,15 (15-29)
Mean midline shift, mm (range)		2,54±2,1 (0-5)
Skull Fracture	Present	14 (70%)
	Absent	6 (30%)

EDH: Extradural Hematoma, CT: Computed Tomography

Table 2: Comparison of 20 pediatric extradural hematoma patients' radiological findings.

This study demonstrates that conservative treatment can be used in appropriately selected PEDH patients who are admitted to the hospital earlier than in previous studies. Fractures near major dural vessels, particularly in the temporal region, and fractures near sinuses were previously thought to be associated with worsening neurological status in patients (19,20). In this study, 14 (70%) of the patients had a skull fracture. Although EDH can be reabsorbed within

No. of disabilities reported	
New onset headaches	2
Epilepsy	0
Normal school performance	20
PTSD	0
Subjectively good quality of life	20
Visual/Auditory problems	0
Regular requirement of analgesics	0

Table 3: Summary of outcomes on 1 year follow-up standardized interview

hours, complete resorption of EDH takes 3–12 weeks (8,12). In our series, the hematoma was completely resorbed in 85% of our patients by the 12th week. Tuncer et al. also stated that in patients with EDH and skull fractures, hematoma resorption is greater and faster, which may be a helpful prognostic factor for conservative rather than surgical treatment (23). Although skull fractures do not appear to necessitate surgical intervention, it is a risk factor that should be considered.

Another important factor to consider is the availability of multiple locations. When PEDH is multilobar, surgical treatment is required more frequently than when it is single lobe (15,24). Although previous studies did not focus on multilobar EDHs, they have compared them to localization data without providing a ratio. The presence of multilobarity in EDH treated conservatively ranges from 33% to 46% (16,19,20). In our study, 8(40%) had PEDH that covered more than one lobe, usually two lobes on the same side. The reason for this factor, which most likely influences hematoma thickness, is that the hematoma mass that crosses the suture line continues parallel to the skull. As a result, axial plane growth is likely to be reduced. As a result, a hematoma does not cause dura and parenchymal compression. It also demonstrates that multilobarity PEDH can be treated non-surgically.

When comparing surgical and conservative treatment options, social and psychological factors should be taken into account. In surgical practices, which is a very traumatic experience for children, three clinical phenomena have been described: 1-preoperative anxiety, 2-postoperative maladaptive behavior changes, and 3-delirium (25). During surgery and anesthesia, more than 65% of children experience intense anxiety and fear. Among the newly developed maladaptive behavior changes are widespread anxiety, night crying, enuresis, separation anxiety, and temper tantrums. These findings are seen in 50% of the children who have had surgery (26). According to Kain et al. increase preoperative anxiety levels are associated with an increased incidence of postoperative behavioral disorders (27). Postoperative anxiety can cause social problems by preventing patients from participating in physical activities such as games and sports. This situation has a negative impact on the child's physical and mental development. For all of these psychological and social reasons, surgery in children should be avoided if at all possible. Although it is understood that the events will not be remembered precisely, it was observed that patients in this age group were protected from the aforementioned potential adverse conditions following surgery, in face-to-face interviews with the family in the first year using the polyclinic cards (Table 3).

Another limitation of this study is the small sample size. Multi-center studies with a larger sample size are required to confirm our findings and further establish conservative management selection criteria across different hospitals in order to prevent poor outcomes in PEDH.

Conclusion

The study attempted to demonstrate that in PEDH cases, a patient-based treatment decision can be made by combining clinical and radiological findings. It also demonstrated that conservative treatment with good follow-up can be used in patients with early admission and multilobar large PEDH. We believe that conservative treatment with an experienced team in fully equipped facilities may be a viable option. Furthermore, the study emphasized that surgeons should consider the possibility of a socio-cultural influence on children who have undergone surgery in their future lives.

Conflict of Interest: The authors declare no conflict of interest regarding this study.

Financial Disclosure: This research received no specific grant from any funding agency in the public, commercial, or notfor-profit sectors.

Authors' Contributions: R.A. and U.S. wrote the article. R.A. conceived the idea. R.A. and U.S.collected data. R.A. analyzed data. U.A. assisted with study design and revised the article. All authors have read and approved the final manuscript.

Ethical Approval: Approval was obtained from Bursa Training and Research Hospital Clinical Researches Ethical Committee Date:08-01-2020, Decision No:2011-KAEK-25 2020/01-26

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The Relationship Between Procalcitonin Level and Short Term Mortality in Emergency Department

Acil Serviste Prokalsitonin Düzeyi ile Kısa Dönem Mortalite Arasındaki İlişki

Onur Barış Cehreli¹, Başak Bayram², Duygu Gürsoylu³, Neşe Çolak²

ABSTRACT

Aim: Procalcitonin (PCT) is a biomarker for infection, which has grown in popularity in recent years. In our study, we investigated whether there was a relationship between procalcitonin levels and seven-day mortality in all patients whose procalcitonin levels were measured in the emergency department (ED).

Material and Methods: In this single-center, cross-sectional, analytic, retrospective study, the patients whose PCT levels were measured in Dokuz Eylül University Hospital adult emergency department between 01.01.2016 and 31.03.2016 were included. PCT level and other parameters were evaluated in the survived and non-survived groups,

Results: We analyzed 499 patients whose PCT levels were measured. The median age was 74 (IQR: 63-82) years, and 54% were male. Of the 499 patients, 6 (1.2%) had a low procalcitonin level (median 0.03; IQR 0.02-0.04), 407 (81.6%) had an intermediate procalcitonin level (median 0.26; IQR 0.16-0.54) and 86 (17.2%) had a high procalcitonin level (median 5.54; IQR 3.20-15.31). When the PCT level-high group was compared with the other groups; systolic blood pressure (SBP), diastolic blood pressure (DBP), platelet count, pCO₂ were lower and pulse rate, WBC, lactate, base excess values were higher. It was found that 249 (49.9%) of the patients were discharged from the ED, 112 (22.4%) were hospitalized, 66 (13.2%) were hospitalized in the intensive care unit, and 72 (14.4%) died. The PCT level was higher in the non-survivor group than in the survivor group (0.29 ngr/mL vs 1.07 ngr/mL, p<0.001). Univariate analysis showed that the non-survivor group had higher age, pulse, respiratory rate, procalcitonin levels, lactate and base deficiency levels, and lower SBP, DBP, oxygen saturations, and pH. The AUC for PCT was 0.722 (CI% 0.660-0.784) in the ROC curve. In the multivariate logistic regression analysis, age, SBP, oxygen saturation, and lactate were independent risk factors for mortality in ED.

Conclusion: High PCT levels are associated with increased mortality in patients admitted to the ED. Patients with high PCT levels showed higher mortality and were hospitalized in the intensive care unit. Advanced age, low systolic blood pressure, low oxygen saturation and high lactate levels are independent risk factors for mortality in ED admissions.

Keywords: Procalcitonin, mortality, emergency department, hospitalization

ÖZ

Amaç: Prokalsitonin (PKT), enfeksiyonu gösteren biyobelirteçtir ve son yıllarda popülaritesi artmaktadır. Çalışmamızda acil serviste (AS) prokalsitonin düzeyi ölçülen hastalarda prokalsitonin düzeyleri ile yedi günlük mortalite arasında ilişki olup olmadığını araştırdık.

Gereç ve Yöntemler: Tek merkezli, kesitsel, analitik, retrospektif bu çalışmaya Dokuz Eylül Üniversitesi Hastanesi erişkin acil servisinde 01.01.2016-31.03.2016 tarihleri arasında PKT düzeyi ölçülen hastalar dahil edildi. Yaşayan ve ölen hasta gruplarında PKT düzeyi ve diğer parametreler değerlendirildi.

Bulgular: PKT düzeyi ölçülen 499 hastayı analiz ettik. Yaş ortalaması 74 (ÇAA 63-82) ve % 54'ü erkekti. Prokalsitonin düzeyleri 499 hastanın 6'sında (%1,2) hafif yüksek (ortanca 0,03; ÇAA 0,02-0,04), 407'sinde (%81,6) orta yüksek (ortanca 0,26; ÇAA 0,16-0,54) ve 86'sında (%17,2) ciddi yüksek (ortanca 5,54; ÇAA 3,20-15,31) seviyelerde idi. PKT düzeyi yüksek olan grup diğer gruplarla karşılaştırıldığında; sistolik kan basıncı (SKB), diyastolik kan basıncı (DKB), trombosit sayısı, pCO₂ daha düşük iken; nabız, beyaz küre, laktat, baz açığı değerleri daha yüksekti. Hastaların 249'unun (%49,9) acil servisten taburcu edildiği, 112'sinin (%22,4) servise yattığı, 66'sının (%13,2) yoğun bakımda yattığı ve 72'sinin (%14,4) öldüğü belirlendi. Ölen grubun PKT düzeyleri, yaşayan gruba göre daha yüksekti (0,29 ngr/mL'ye karşı 1,07 ngr/mL, p<0,001). Tek değişkenli analizde, ölen grubun yaş, nabız, solunum hızı, prokalsitonin seviyeleri, laktat ve baz açığı değerleri daha yüksek ve SKB, DKB, oksijen satürasyonu ve pH değerlerinin daha düşük olduğu gösterildi. ROC eğrisinde PKT için eğri altında kalan alan değeri 0,722 (%95 GA 0,660-0,784) idi. Çok değişkenli lojistik regresyon analizinde, yaş, SKB, oksijen satürasyonu ve laktat acil serviste mortalite için bağımsız risk faktörleri olarak tespit edildi.

Sonuç: Acil servise başvuran hastalarda yüksek PKT seviyeleri artmış mortalite ile ilişkilidir. PKT düzeyi yüksek olan hastalarda yoğun bakım ünitesine yatış ve ölüm daha fazladır. Acil servis başvurusunda ileri yaş, düşük sistolik kan basıncı, düşük oksijen satürasyonu ve yüksek laktat seviyeleri mortalite için bağımsız risk faktörleridir.

Anahtar Kelimeler: Prokalsitonin, mortalite, acil servis, hastaneye yatış

Received: March 6, 2023

Accepted: May 5, 2023

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Atf için/Cited as: Cehreli OB, Bayram B, Gürsoylu D, Colak N. The Relationship Between Procalcitonin Level and Short Term Mortality in Emergency Department. Anatolian J Emerg Med 2023;6(3):105-110. <https://doi.org/10.54996/anatolianiem.1245961>

Introduction

Procalcitonin (PCT) is the prohormone of calcitonin synthesized from the thyroid gland. It is also secreted from neuroendocrine cells in the liver, lungs, pancreas and intestines (1,2). PCT increases within three hours of response to stimulation and is eliminated within 24 to 35 hours (3). PCT correlates with bacterial infection and not elevate viral infections and systemic immunological diseases (4). It is recommended to measure PCT in the diagnosis and follow-up of sepsis in the sepsis guideline (5). PCT increases in other conditions such as multiple trauma, heart failure, pyelonephritis, pancreatitis, appendicitis, mesenteric ischemia, osteomyelitis, inhalation burns, ARDS, septic arthritis, infective endocarditis, tuberculosis, cardiogenic shock, rhabdomyolysis, liver transplant rejection or renal failure (6-10).

It has been reported that the PCT level correlates with the severity of the inflammation and is associated with the prognosis of the patient in many diagnostic groups (4,8-10). Previous studies were showed that lactate is an independent risk factor for showing 10-day mortality in the ED (11). However, we found that no similar research was conducted for PCT in the literature.

Our aim in this study is to investigate the relationship between PCT levels and short-term (7-day) mortality in all patients whose PCT levels were measured in the ED.

Material and Methods

Study design and setting

This is a single-center, cross-sectional, analytic, retrospective study. The study was conducted at the Dokuz Eylül University Hospital Department of Emergency Medicine between 01/01/2016- 31/03/2016, after the ethics approval from the Dokuz Eylül University Ethics Committee (14.07.2016 / 2799-GOA). The ED at Dokuz Eylül University Hospital is a 45-bed tertiary hospital ED with 86,000 patients per year.

Participants

All patients > 18 years of age who measured PCT levels at admission to the ED were included in the study. Patients with missing information were excluded from the study.

Data collection and processing:

Information such as age, gender, diagnosis of the patients in the ED, laboratory parameters, vital signs, seven-day outcomes was screened from the electronic patient information management system. ICD-10 diagnostic codes were used as diagnosis groups. Procalcitonin levels were classified as PCT level-low (<0.05 ngr / mL), PCT level-intermediate (0.5-2.0 ngr / mL), PCT level-high (> 2.0 ngr / mL).

Statistical analysis

Study data were recorded in the "Statistical Package for Social Sciences for Windows 22.0". Normality analyzes were evaluated with the Kolmogorov-Smirnov test. When comparing the values of the patients such as age and laboratory, the T-test or Mann-Whitney test was used according to normality analysis. The Chi-square test was used to compare categorical variables. The receiver operating characteristic (ROC) analysis was performed and area under the curve (AUC) values were calculated for

surviving and non-surviving patients. P Values <0.05 were considered statistically significant. Univariate analysis was performed to evaluate the factors affecting mortality. p Values > 0.2 among these parameters were evaluated by multivariate logistic regression analysis whether they were independent risk factors for mortality.

Results

Baseline characteristics

During the study period, procalcitonin level was measured in 507 of 29,588 patients who have been admitted to ED. Eight patients were excluded from the study according to exclusion criteria. Finally, 499 patients were included in the study. According to procalcitonin categories; Low PCT levels were measured in 6 (1.2%) patients, intermediate levels in 407 (81.6%) patients, and high values in 86 (17.2%) patients (Figure 1). It was found that 249 (49.9%) of the patients were discharged from the ED, 112 (22.4%) were hospitalized in the ward, 66 (13.2%) were hospitalized in the intensive care unit, and 72 (14.4%) die. There were two patients hospitalized in the ward in the PCT level –low group.

The median age was 74 (IQR: 63-82) years, and 269 patients (54%) were male. Of the 499 patients, 6 (1.2%) had a low PCT level (median 0.03; IQR 0.02-0.04), 407 (81.6%) had an intermediate procalcitonin level (median 0.26; IQR 0.16-0.54) and 86 (17.2%) had a high procalcitonin level (median 5.54; IQR 3.20-15.31). When the PCT level-high group was compared with the other groups; systolic blood pressure (SBP), diastolic blood pressure (DBP), platelet count, pco2 were lower and pulse rate, WBC, lactate, base excess values were higher. Table 1 presents the baseline characteristics of enrolled patients.

Procalcitonin level and seven-day outcomes

When patients are grouped as survivor and non-survivor groups according to the seven-day outcomes; demographic characteristics, vital signs and laboratory parameters are shown in Table 2. The median PCT level was higher in the non-survivor group than the survivor group (0.29 ngr/mL vs 1.07 ngr/mL, p<0.001).

The AUC for procalcitonin was 0.722 (0.660-0.784) in the ROC curve (Figure-2). The specificity and sensitivity for different cut-off values of procalcitonin were shown in Table 3.

Univariate analysis showed that the non-survivor group had higher age, pulse, respiratory rate, procalcitonin levels, lactate and base deficiency levels, and lower SBP, DBP, oxygen saturations, and pH (Table 2). In the multivariate logistic regression analysis, age, SBP, oxygen saturations, and lactate were independent risk factors for mortality in ED (Table 3).

Procalcitonin levels of the patients according to the diagnosis groups are shown in Table-4. The highest procalcitonin values were measured in the urinary system and digestive system disorders, respectively.

Discussion

In our study, we examined the short-term mortality of patients whose procalcitonin levels were measured in the ED. According to the results of our study, we found that the

	Initial PCT Level on ED Admission			P
	PCT level - low (<0.05 ngr/mL) n=6	PCT level- intermediate (0.5-2.0 ngr/mL) n= 407	PCT level – high (>2.0 ngr/mL) n=86	
Age, median (IQR)	68.5 (37.8 -86.3)	74.0 (64.0-32.0)	72.5 (63.0-84.0)	0.816
Male, n(%)	1 (16.7)	209 (51.4)	59 (68.6)	0.003
Outcomes				
Survivors n(%)	6 (100)	362 (88.9)	59 (68.6)	<0.001
Non- survivors n(%)	0	45 (11.1)	27 (31.4)	
Vital Signs				
SBP (mmHg)	136 (111-151)	126 (110-136)	116 (94-132)	0.001
DBP (mmHg)	80 (76-87)	80 (70-85)	70 (56-82)	<0.001
Pulse rate (beats/min)	84 (82-92)	88 (82-106)	98 (82-116)	0.013
Respiratory rate (beats/min)	18 (16-21)	19 (16-22)	20 (17-24)	0.182
Oxygen saturation %	96 (93-98)	96 (90-98)	94 (90-97)	0.164
Laboratory				
Procalcitonin (ngr/ml)	0.03 (0.02-0.04)	0.26 (0.16-0.54)	5.54 (3.20-15.31)	<0.001
Complete Blood Count				
WBC (10 ³ /μl)	10 (8-13)	11 (8-14)	14 (9-21)	0.002
Hemoglobin (gr/dl)	12 (10-14)	12 (10-13)	11 (10-13)	0.226
Platelet (10 ³ /μl)	261 (236-341)	229 (175-307)	188 (133-271)	0.001
Blood gas				
pH	7.43 (7.36-7.48)	7.41 (7.35-7.46)	7.43 (7.36-7.48)	0.481
PCO2	37 (36-46)	37 (31-43)	30 (23-36)	<0.001
Lactate (mmol/l)	1.4 (1.3-1.6)	1.5 (1.1-2.4)	2.0 (1.4-4.0)	0.001
Base excess (mmol/l)	0.9 ([-0.95]-3.45)	-0.8 ([-4.00]-2.02)	-3.6 ([-9.00]-[-1.00])	<0.001

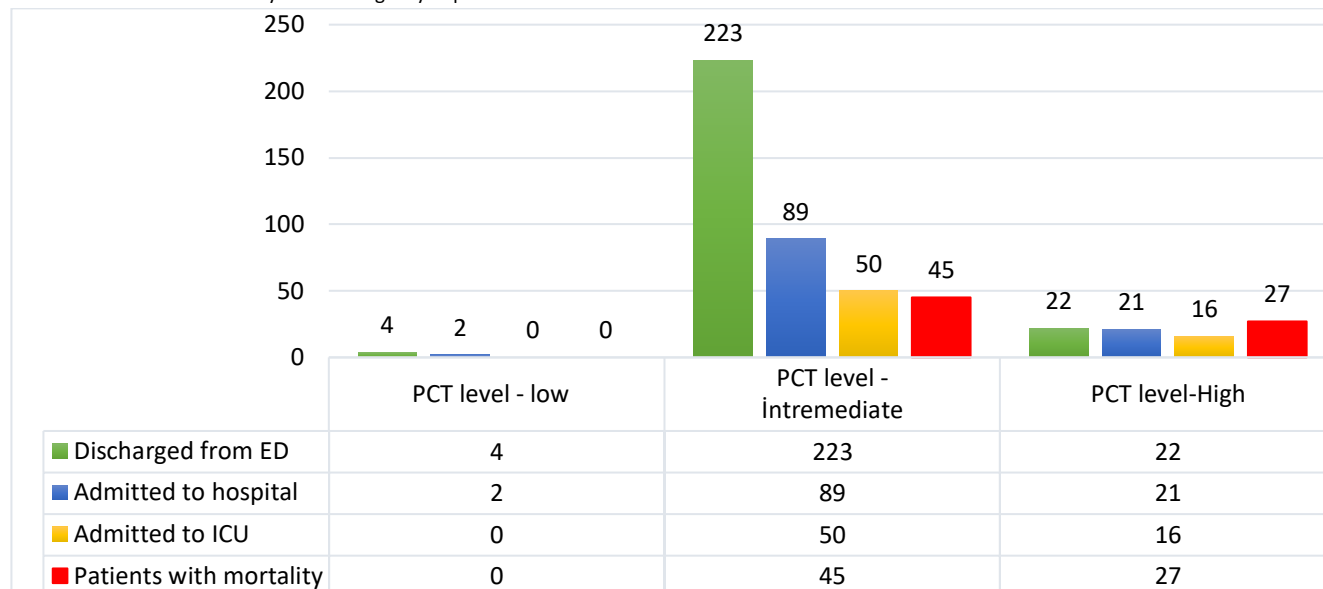
SBP: Systolic blood pressure, DBP: Diastolic blood pressure, WBC: White blood cell

Table 1. Baseline characteristics of patients

	survivors		non- survivors		Odss ratio (95% CI)	P
	N	Median (IQR)	N	Median (IQR)		
Age	427	73 (63-81)	72	81.5 (66-86)	1.032 (1.012-1.053)	0.001
Vital signs						
SBP (mmHg)	427	126 (112-136)	72	106 (81-131)	0.975 (0.965-0.985)	0.002
DBP (mmHg)	427	80 (70-85)	72	68 (51-82)	0.961 (0.946-0.977)	<0.001
Pulse rate (beats/min)	427	87 (82-105)	72	102.5 (82-125)	1.020 (1.009-1.031)	<0.001
Respiratory rate (beats/min)	427	19 (16-22)	72	22 (18.3-28)	1.151 (1.097-1.208)	<0.001
Oxygen saturation %	427	96 (91-98)	72	90 (80-96)	0.937 (0.914-0.961)	<0.001
Laboratory						
Procalcitonin (ngr/ml)	427	0.29 (0.16-0.73)	72	1.07 (0.32-5.30)	1.033 (1.013-1.054)	0.001
Complete Blood Count						
WBC (10 ³ /μl)	427	11 (8.1-14.3)	72	14.2 (9.3-22.4)	1.016 (0.995-1.038)	0.133
Hemoglobin (gr/dl)	427	11.8 (10.4-13.4)	72	11.2 (9.7-12.3)	0.860 (0.767-0.963)	0.262
Platelet (10 ³ /μl)	427	225 (170-301)	72	222 (138-308)	0.999 (0.996-1.001)	0.262
Blood Gas						
pH	319	7.42 (7.37-7.46)	64	7.41 (7.29-7.47)	0.063 (0.006-0.614)	0.017
PCO2	319	36.6 (30.4-42.8)	64	30.4(26.2-38.8)		0.004
Lactate (mmol/l)	319	1.5 (1.0-2.3)	64	2.7 (1.4-5.8)	1.302 (1.180-1.436)	<0.001
BE (mmol/l)	319	-1.0 ([-4.1-1.9])	64	-3.1 ([-3.1 -0.5])	0.900 (0.841-0.935)	<0.001

CI = confidence interval, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, WBC: White blood cell

Table-2: Characteristics of survivor and non- survivor patients



ED, Emergency Department; ICU Intensive Care Unit

Figure 1: Seven-day outcomes of patients according to PCT categories

Parameter	OR	95% CI		P value
		Lower	Higher	
Age	1.027	1.002	1.053	0.038
SBP (mmHg)	0.985	0.974	.0996	0.008
Pulse rate (beats/min)	1.006	0.993	1.019	0.380
Respiratory rate (beats/min)	1.074	0.994	1.161	0.071
Oxygen saturation %	0.951	0.910	0.994	0.026
Procalcitonin (ngr/ml)	1.018	0.993	1.044	0.156
Hemoglobin (gr/dl)	0.921	0.798	1.062	0.257
pH	1.436	0.408	5.048	0.573
pCO2	0.979	0.945	1.014	0.232
BE (mmol/l)	1.001	0.992	1.010	0.863
Lactate (mmol/l)	1.209	1.056	1.383	.006

Hosmer–Lemeshow goodness-of-fit $p = 0.873$

Table 3. Multivariate analysis of the variables as a seven –day mortality

procalcitonin levels of non-survivor patients were significantly higher than the survivor patients. Literature has shown that procalcitonin levels are showing mortality in sepsis, heart insufficiency and pneumonia (6,8,9). These studies are mostly on infectious diseases. Arora and his friends` systematic composition and meta-analysis showed that procalcitonin levels in the early sepsis phase are significantly lower in surviving patients than the non-survive patients (12). In our study, we took all patients who has measured procalcitonin levels without discriminating the other diagnosis.

There are lots of parameters that are showing the disease severity and mortality for a patient who is coming to emergency services. These are mostly scoring systems that need complex measurements (13-15). But these score

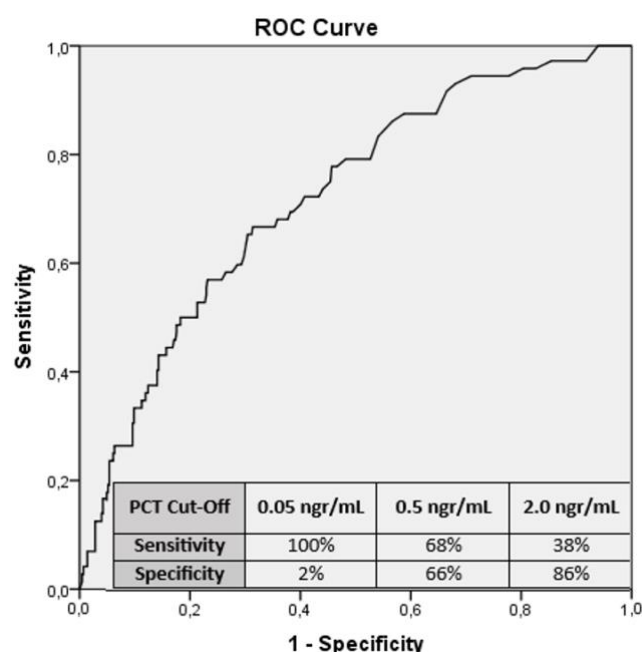


Figure 2. ROC curve and sensitivity-specificity values according to procalcitonin level

systems are not used in routines and common. In emergency services, we need easily accessible and simple parameters for measuring mortality. Procalcitonin is an easily measurable biomarker that gives you results in about 1 hour with 4 ml of blood. Because of easily accessible and applicable, procalcitonin is more advantageous than other scoring systems. The success of procalcitonin in predicting mortality may change emergency service practice. However, in our study, the majority of the patients were diagnosed with infection and pulmonary diseases. Therefore, more comprehensive studies are needed in patients diagnosed other than infection.

In our study, it was found that systolic blood pressure, diastolic blood pressure, oxygen saturation, thrombocyte and pCO2 values were lower in the non-survivor patients compared to the survivor patients. Their age, pulse rate, respiratory rate, base deficit, lactate and procalcitonin levels

ICD group	n	Median (IQR)
Diseases of the respiratory system (J00-J99)	207	0.32 (0.17-0.90)
Certain infectious and parasitic diseases (A00-B99)	114	0.43 (0.19-2.30)
Diseases of the circulatory system (I00-I99)	47	0.22 (0.14-0.40)
Diseases of the genitourinary system (N00-N99)	31	0.68 (0.34-1.31)
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	28	0.20 (0.12-0.47)
Diseases of the nervous system (G00-G99)	26	0.18 (0.11-0.30)
Neoplasms (C00-D49)	16	0.26 (0.16-0.58)
Diseases of the digestive system (K00-K95)	17	0.60 (0.24-2.75)
Endocrine, nutritional and metabolic diseases (E00-E89)	8	0.46 (0.15-1.98)
Diseases of the musculoskeletal system and connective tissue (M00-M99)	5	0.28 (0.09-0.70)

Table 4. Procalcitonin values according to ICD-10 group

were higher in the non-survivor patients. High mortality in patients with unstable vital signs (such as hypoxic, hypotensive, tachycardia) is an expected condition. Also, lactate, which is an indicator of hypoperfusion, was higher in the patient group who died. In the study of Pedersen et. al., it was stated that lactate is a parameter showing the seven-day mortality in the emergency department (11). This study included infection, trauma, cardiac diseases, digestive diseases, neurological diseases and respiratory system diseases groups. In our study, we made a similar assessment for procalcitonin, inspired by this study. Procalcitonin also predicts mortality in emergency service patients such as lactate regardless of the diagnosis group. However, in the multivariate analysis, we found that age, systolic blood pressure, oxygen saturation and lactate values are independent risk factors for mortality.

When we examine procalcitonin levels categorically in our study; in the group with low procalcitonin levels (<0.05 ng/ml), there were no patients hospitalized in the intensive care unit or who died. On the other hand, in the group with high procalcitonin levels (>2.0 ng/ml) were more patients hospitalized in the intensive care unit (%18.6) or died (%34.6). In this group, systolic blood pressure, diastolic blood pressure, platelet level and pCO₂ levels were lower; heart rate, WBC, lactate and base deficit were higher.

In recent years, procalcitonin has been used to exclude non-infectious conditions and to determine the severity of infection in patients in whom the diagnosis of infection cannot be made clear in the emergency department. However, there is no single reliable cut-off value for procalcitonin in the literature. In our study, we found the AUC value 0.722 according to the roc curve. According to this, mortality was not encountered with procalcitonin values below <0.05 ng/ml, while the sensitivity for death was %38 and specificity was %86 for values >2.0 ng/ml.

Limitations

Our results cannot be generalized for the pediatric patient. This study was carried out only in one center; it was also

another limitation of the study, the number of patients with the non-infectious diagnosis was small.

Conclusion

High PCT levels are associated with increased mortality in patients admitted to the ED. Patients with high- PCT levels showed higher mortality and were hospitalized in the intensive care unit. In these patients, SBP, DBP, thrombocyte and pCO₂ levels are lower, while pulse rate, WBC, lactate and base deficiency values are higher. Advanced age, low systolic blood pressure, low oxygen saturation and high lactate levels are independent risk factors for mortality in ED admissions.

Conflict of Interest: The authors declare no conflict of interest regarding this study.

Financial Disclosure: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authors' Contributions: OBC and NC. wrote the article. OBC conceived the idea. OBC and DG. collected data. BB analyzed data. NC assisted with study design and revised the article. All authors have read and approved the final manuscript.

Ethical Approval: Approval was obtained from Dokuz Eylul University Clinical Researches Ethical Committee Date:14.07.2016, Decision No:2799-GOA.

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Association Between Riders' Characteristics and Injury Patterns in The Motorcycle or Electric-Bike Accidents

Motosiklet veya Elektrikli Bisiklet Kazalarında Binicilerin Özellikleri ile Yaralanma Modelleri Arasındaki İlişki

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ABSTRACT

Aim: Many risk factors have been reported to be responsible for morbidity and mortality in motorcycle and electric bike (e-bike) accidents. This study aims to determine the associations between the demographic features of motorcycle or e-bike riders and clinical outcomes.

Material and Methods: This is a retrospective case-control study conducted in an academic emergency department (ED). All adult patients admitted to the ED due to motorcycle or e-bike accidents were included.

Results: A total of 358 patients were included in the study. Of the patients, 100 (28.1%) required hospitalization where 58 (16.3%) required surgery. Injuries were related with the upper extremities (15.4%), head and neck (14.8%), and lower extremities (11.2%) in the patients. Nighttime accidents, alcohol use, and lack of protective equipment were related to multiple injuries, need for hospitalization, surgery, blood transfusion, and mortality ($p<0.05$ for all variables). There was no significant difference between the motorcycle and e-bike riders in demographic features, injury pattern, need for hospitalization, need for surgery, or mortality ($p>0.05$).

Conclusion: Nighttime accidents, alcohol or drug use, and lack of protective equipment could lead to multiple injuries, need for hospitalization, surgery, blood transfusion, and mortality. Moreover, the risk of poor outcomes is similar between the motorcycle and e-bike riders.

Keywords: Non vehicle traffic accident, motorcycle accident, e-bike accident, emergency department

ÖZ

Amaç: Motosiklet ve elektrikli bisiklet (e-bisiklet) kazalarında, morbidite ve mortaliteden sorumlu birçok risk faktörünün olduğu bildirilmiştir. Bu çalışmada amaç, motosiklet veya e-bisiklet sürücülerinin demografik özellikleri ile klinik sonuçlar arasındaki ilişkiyi belirlemektir.

Gereç ve Yöntemler: Bu çalışma, akademik bir acil servise yürütülen retrospektif bir vaka kontrol çalışmasıdır. Çalışmaya motosiklet veya e-bisiklet kazaları nedeniyle acil servise başvuran tüm yetişkin hastalar dahil edilmiştir.

Bulgular: Çalışmaya toplam 358 hasta alındı. Hastaların 100'ünde (%28.1) hastaneye yatış, 58'inde (%16.3) ameliyat gerekti. Hastaların yaralanmaları üst ekstremitelere (%15.4), baş-boyun (%14.8) ve alt ekstremitelere (%11.2) ile ilişkiliydi. Gece gerçekleşen kazalar, alkol kullanımı ve koruyucu ekipman eksikliği; çoklu yaralanmalar, hastane yatış ihtiyacı, ameliyat, kan transfüzyonu ve mortalite ile ilişkiliydi (tüm değişkenler için $p<0.05$). Motosiklet ve e-bisiklet sürücülerinde demografik özellikler, yaralanma paterni, hastaneye yatış, ameliyat ihtiyacı veya mortalite açısından anlamlı bir fark yoktu ($p>0.05$).

Sonuç: Gece kazaları, alkol veya uyuşturucu kullanımı ve koruyucu ekipman eksikliği; çoklu yaralanmalara, hastaneye yatış ihtiyacına, ameliyata, kan transfüzyonuna ve ölüme neden olabilir. Ayrıca motosiklet ve e-bisiklet kazalarında sürücülerin kötü sonuç alma riski benzerdir.

Anahtar kelimeler: Araç dışı trafik kazası, motorsiklet kazası, e-bisiklet kazası, acil servis

Received: March 22, 2023

Accepted: May 2, 2023

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Atif için/Cited as: Abacı E, Köse A, Özturan İU, Buyurgan CS, Babuş SB, Erdoğan S. Association Between Riders' Characteristics and Injury Patterns in The Motorcycle or Electric-Bike Accidents. Anatolian J Emerg Med 2023;6(3):111-116. <https://doi.org/10.54996/anatolianjem.1269174>

Introduction

According to World Health Organization (WHO), approximately 1.35 million people die annually due to motor vehicle accidents (MVA) globally. Moreover, in many of those who survived, organ loss or failure, injuries required intense treatment or long-term function loss are very common [1]. MVA is a leading reason for mortality in young adults. Vulnerable road users (VRU) including pedestrians, cyclists, and motorcyclists account for more than half of all patients with mortality after MVA [2]. The use of two-wheel vehicles has been increasing worldwide due to their being cheap and easy to use [3]. Therefore, the incidence of motorcycle accidents has been increasing gradually [4]. In 2018, WHO reported 379.356 death caused by motorcycle accidents worldwide [1]. Even in the developed countries where motorcycle accident-related morbidity and mortality (M&M) rates are lower, injury and mortality rates are 20 times higher among motorcycle riders compared to other vehicle drivers (5,6).

Many factors including lack in the use of protective equipment, riding under alcohol or drugs effect, high speed, and inexperience are related to motorcycle accidents [7]. However, the data on the relationship between the injury type and accident timing, motorcycle type, need for hospitalization, or surgery is limited in the literature. This study aimed to determine the association between demographic features and injury patterns in patients with motorcycle or e-bike accidents in the emergency department (ED).

Material and Methods

Design, Setting, and Population

This was a retrospective case-control study conducted in an ED of a tertiary care facility. All patients older than 18 years who were admitted to the ED with motorcycle or e-bike accidents between January 2018 and January 2019 were included in the study. Accidents related to bicycles or other vehicles, patients who left the ED against medical advice and had missed information in electronic medical records were excluded. Institutional review board approval was obtained for the study (approval date: 2019.11.20, 2019/496 decision dated and numbered).

Study protocol

Demographic features, vehicle type (motorcycle vs e-bike), the timing of the day (06:00-18:00 vs 18:00-06:00), the season of the year, the influence of alcohol, use of protective equipment (at least helmet), injury type, area of injury, presence of multiple trauma, need for hospitalization or surgery and length of hospital stay (LOS) were recorded from the hospital electronic medical records (EMR). Demographic characteristics related to patients and accidents, area of injury, or fracture were compared according to the presence of multiple trauma, need for hospitalization, use of protective equipment and type of the vehicle. Multiple trauma was defined as injuries associated with at least two systems or one system and two large bones.

Data Analysis

Shapiro Wilk test was used to assess the normality of distribution. Student-t-test or Mann-Whitney U test was used to compare the variables according to the normality of

distribution. Normally distributed variables were presented as mean and standard deviation (SD) whereas median and interquartile range (IQR) were presented for non-normally distributed variables. A Chi-square test was performed to compare categorical variables. Significance was set at a p-value of .05. Descriptive statistics were given as n and percentage. Decimals were rounded for a better read.

Results

During the study period, 383 of 1702 MVA patients were admitted to the ED due to motorcycle or e-bike accidents. After excluding 25 patients due to missed information in the EMR, a total of 358 patients were included in the study. The mean age of patients was 33±13 years and 93% were male. Hundred (28.1%) patients required hospitalization with a mean LOS of 6.5±11. Of the patients, 58 (16,3%) required surgery. At the time of the accident, 12.9% of the patients were under the influence of alcohol, and the use of protective equipment was only 23.7%. Mortality was seen in 7 (2%) patients. Other descriptive characteristics have presented in Table 1.

Age (years), mean (SD)	33 (13)
Male sex, n (%)	332 (92,7)
Accident timing	
06:00 – 18:00, n (%)	175 (48,9)
18:00-06:00, n (%)	183 (51,1)
Season	
Fall, n (%)	88 (24,6)
Winter, n (%)	67 (18,7)
Summer, n (%)	102 (28,5)
Spring, n (%)	101 (28,2)
Vehicle type	
Motorcycle, n (%)	340 (95)
E-bike, n (%)	18 (5)
Alcohol use, n (%)	46 (12,9)
Protective equipment, n (%)	85 (23,7)
Outcome	
Hospitalization, n (%)	100(28,1)
Intensive care admits	30 (31,9)
LOS, mean (SD)	6.5 (11)
Surgery, n (%)	58 (16,3)
Blood transfusion, n (%)	15 (4,2)
Intubation	8 (2,2)
Mortality n (%)	7 (2)

Table 1. Demographic features of the study participants

Soft tissue (n=177, 50%) and extremity injuries (n=96, 27%) were the most common injury types. Distribution for the areas of injury was presented in Figure 1. Fractures were detected in % 39,7 (n= 142) of the patients. Among the

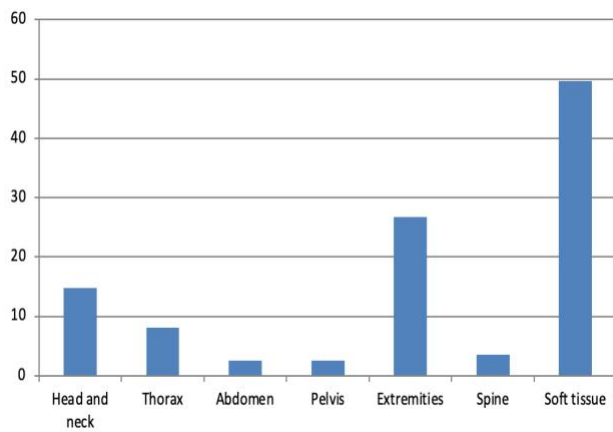


Figure 1: Distribution of the areas of injuries patients who had bone fractures, the most common locations were upper extremities in 55 (15%), lower extremities in 40 (11%), pelvic fractures in 34 (9.5%) and dislocations in % 1,4 (n= 5). Distribution for the location of fractures was presented in Figure 2.

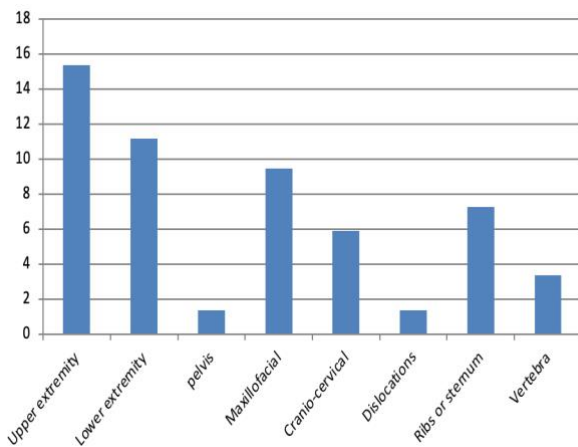


Figure 2: Distribution of the areas of fractures

Multiple trauma was seen in 93 (26%) patients. In patients with multiple trauma, nighttime accidents ($p=0.006$), influence of alcohol ($p=0.002$), use of protective equipment ($p=0.003$), need for hospitalization ($p<0.001$), need for surgery ($p<0.001$), need for blood transfusion ($p<0.001$), intubation ($p<0.001$), LOS ($p=0.024$) and mortality rate ($p<0.001$) were significantly higher than the patients with isolated trauma. When the relationship between the presence of multiple injuries and the areas of injury in the body is examined; head/neck ($p<0.001$), thorax ($p<0.001$), extremity ($p<0.001$), spinal ($p<0.001$), and soft tissue injury ($p<0.001$) rates were statistically significantly higher in the patient group with multiple injuries. It was determined that 85 of the patients used helmets and 273 didn't use helmets. In patients who didn't use helmets, night time accidents ($p=0.001$), influence of alcohol ($p=0.002$), multiple trauma ($p=0.002$), need for hospitalization ($p=0.002$), and fracture ($p=0.014$) rates were significantly higher than helmets users (Table 2). The presence of head/neck ($p<0.001$), maxillofacial injury ($p=0.001$) and cranial fracture ($p=0.006$) was found to be statistically significantly higher in patients who did not use helmets ($p<0.05$).

Of the study patients, only 18 (5%) had been using e-bikes. There was no statistically significant difference between the vehicle type and demographic features, injury pattern, multiple injuries, alcohol, fracture, need for hospitalization, need for surgery, blood transfusion or mortality ($p>0.05$ for all variables). However, in all patients with mortality (2%), vehicle type was all motorcycle and none of the patients had used protective equipment (Table 3). Injury types and fractures were more common in motorcycle accidents, but were not found to be statistically significant ($p>0,05$).

In hospitalized patients (26%), lack of protective equipment ($p=0.021$), use of alcohol ($p<0.001$), nighttime riding ($p=0.04$), multiple injuries ($p<0.001$), fractures ($p<0.001$), need for surgery ($p<0.001$), intubation ($p<0.001$), blood transfusion ($p<0.001$) and mortality ($p=0.002$) were significantly higher than the non-hospitalized patients. Although all types of injury patterns were significantly higher in the hospitalized group, the presence of pelvic fractures and dislocations were similar between hospitalized and non-hospitalized patients. ($p=0.6$, $p=0.7$, respectively).

Discussion

In our study, it was determined that motorcycle or e-bike accidents, mostly occur in the summertime, and predominantly affect males. Also, nighttime accidents, alcohol use, and lack of protective equipment have been found to be related to multiple injuries, need for hospitalization, surgery, blood transfusion, and mortality.

According to the world report on road traffic injury prevention by WHO, male sex has been reported to be a risk factor for MVAs [8]. In our study, 96.7% of the patients were male. Similar to our results, several previous studies reported that males were accounted for motorcycle accidents between 68% to 94.7% [9,10,11]. The reasons for male predominance in motorcycle accidents could include the fact that the use of motorcycles is more common among males, the greater number of males in motorcycling jobs such as courier, and some other sociocultural factors. In a study from Istanbul, Turkey [12], roles of the type of motorcycle and protective equipment use were investigated in motorcycle accidents. In the study population, a rate of 4% of alcohol use and 60-77% of protective equipment used at the time of the accident were reported. Also, it was reported that the riders of heavy motorcycles with an engine limit of $>125\text{cm}^3$ were safer than the riders of light motorcycles. In another study from Lyon, France [9], the rate of alcohol use was between 4.6% to 5.4%, and the use of protective equipment was from 83% to 89%. Also, no significant difference was reported between the moped and motorcycle accidents. In our study, the rate of alcohol use was 13% and the use of protective equipment was 24% at the time of the accidents. The diversity of sociodemographic and cultural backgrounds of the study populations could be the reason for the disparate results of the studies. However, similar to previous studies, we could not detect a difference between the vehicle types.

Multiple trauma accounts for higher morbidity and mortality in the victims of MVA [13]. Moreover, the length of the hospital stays, and healthcare expenditures significantly increase associated with multiple injuries [14,15]. Multiple trauma accounts for higher morbidity and mortality in the

		No protective equipment(n=273)		Protective equipment (n=85)		P
		Number	%	Number	%	
Sex	Female	20	7.3	6	7.1	0.934
	Male	253	92.7	79	92.9	
Accident timing	Day	120	44.0	55	64.7	0.001
	Night	153	56.0	30	35.3	
Season	Winter	48	17.6	19	22.4	0.781
	Autumn	67	24.5	21	24.7	
	Spring	79	28.9	22	25.9	
	Summer	79	28.9	23	27.1	
Vehicle type	Motorcycle	261	95.6	79	92.9	0.392
	E-bike	12	4.4	6	7.1	
Alcohol use		44	16.1	2	2.4	0.002
Multiple trauma		82	30.0	11	12.9	0.002
Consultation		141	52.0	29	34.1	0.004
Surgery		50	18.5	8	9.4	0.090
Hospitalization		85	31.4	15	17.7	0.020
Intubation		8	2.9	0	0.0	0.206
Blood transfusion		14	5.1	1	1.2	0.133
Mortality		7	2.6	0	0.0	0.205
Fracture		118	43.2	24	28.2	0.014

Table 2. The relationship between the use of protective equipment and the clinical parameters of the patients

victims of MVA [13]. Our results supported that need for hospitalization or surgery, blood transfusion and mortality rates are higher in patients with multiple trauma. It is also paramount to note that multiple trauma could be prevented by taking basic preventative measures such as using protective equipment, riding in the daytime, and not using under the influence of alcohol or drugs.

In a study that evaluated the areas of injuries in patients with multiple trauma, related to motorcycle accidents, it was reported that lower extremities, upper extremities, head and neck, and thorax were the most affected regions respectively [5]. Another study reported that head and neck, lower extremities, and upper extremities were the most frequent areas of injury, respectively. It was reported that head and neck injuries are the leading reason for mortality [16]. In another study, head and neck injuries were also found to be highest in patients with mortality [17]. In our study, 26% of the patients had multiple injuries. Among the area of injuries, upper extremities (15.4%), head and neck (14.8%), lower extremities (11.2%), and thorax (8.1%) were the most affected regions respectively in patients with multiple trauma. Interestingly, the incidence of head and neck injuries was found relatively lower although a low rate of helmet use in our study population. High rates of

extremities and thorax injuries in our study could be due to the fewer use of protective jackets and pants because of the warm climate of the study region. The incidence of vertebrae fractures and spinal cord injuries are low in our study (3.4% and 3.6% respectively). Although most of the injury mechanisms of motorcycle accidents include vertical impact collisions, rolling or deflection are also common. This type of collisions more likely to cause multiple injuries including the spinal column [18]. The reason for lower spinal injuries compared to other regions could be explained by many standard protective jackets provides back protection. However, the front part of these jackets does not ensure additional protection. Although the types of protective equipment were not evaluated in our study, we believe that considering motorcycle airbag vests or additional front protection equipment could prevent anterior region injuries.

Alcohol use, frequency of multiple injuries, frequency of fractures, consultation frequency and hospitalization rates were significantly higher in the non-helmet group. In terms of injury and fracture pattern; head-neck injury rate, maxillofacial and cranial fracture rates were statistically higher in the non-helmet group. In publications investigating motorcycle accidents in the literature, helmet use rates

Variables	Motorcycle use (n=340)		E-bike use (n=18)		p	
	Number	%	Number	%		
Sex	Female	24	7.1	2	11.1	0.382
	Male	316	92.9	16	88.9	
Accident timing	Day	163	47.9	12	66.7	0.191
	Night	177	52.1	6	33.3	
Season	Winter	61	17.9	6	16.7	0.149
	Autumn	85	25.0	3	16.7	
	Spring	99	29.1	2	11.1	
	Summer	95	27.9	7	38.9	
Multiple trauma	91	26.8	2	11.1	0.175	
Alcohol use	45	13.2	1	5.6	0.488	
Fracture	136	40.0	6	33.3	0.752	
Consultation	161	47.6	9	50.0	0.845	
Surgery	54	16	4	22.3	0.324	
Hospitalization	94	27.8	6	33.3	0.602	
Intubation	8	2.4	0	0.0	0.689	
Blood transfusion	15	4.4	0	0.0	0.510	
Mortality	7	2.1	0	0.0	0.363	

Table 3. Relation of clinical parameters of patients according to motorcycle and electric bicycle use

varied between 1.15% and 31.4% [19,20]. In patients who do not use helmets; the rates of hospitalization, head injury frequency, injury severity score, length of hospital stay, and hospital re-admission are found to be higher than patients who use helmets [21]. In large-scale studies on helmet use in the United States, it has been reported that 54% of drivers go to traffic without a helmet against all these risks [22]. In a study by Koçak et al. investigating the characteristics of motorcycle accident cases in our country, none of the patients included in the study used a helmet; it was also reported that they did not use additional protective equipment such as gloves, protective clothing, glasses, knee pads; and as a result, higher mortality rates were reported compared to our study [23]. Injuries related to e-bike accidents have been rising globally as the use of e-bike widespread [24]. Previous studies have shown that the injuries related to e-bike accidents could be as serious as motorcycle accidents [25]. In a study from Sweden, it was reported that the most common injured areas were head and neck, upper extremity, face, and chest in victims of e-bike accidents. Another study reported a higher rate of hospitalization and surgery in e-bike riders compared to cyclists [24]. A study from China also reported that the rate of the need for surgery was 34.9% and the need for intensive care admission was 24.7% [26]. Although the number of e-bike riders was low in this study, no significant differences were detected between the e-bike and motorcycle riders in

terms of having multiple injuries, fractures, need for hospitalization, and surgery. These results suggest that e-bike accidents should be considered as high-energy trauma and be approached similarly to motorcycle accidents. Therefore, regulations for e-bike riders including driving license, the legal obligation for protective equipment, and alcohol limit should be considered.

Limitations

This study has many limitations. First, this is a single-center retrospective study. Only the patients with complete data regarding the demographic and clinical information could be included. Also, many factors that might affect the risk of accidents and injury patterns could not be evaluated because of the retrospective nature of this study, such as years of experience, types of protective equipment, speed, motorcycle training, or motorcycle engine capacity. Second, because of the lack in the chart review, the severity of injuries could not be evaluated with a standardized method such as injury severity score. Third, the number of e-bike accidents was low in our study. The higher number of e-bike accidents could provide a better comparison with motorcycle accidents. Fourth, drivers and passengers were not differentiated in our study. However, both of the rider types could be considered as vulnerable road users and injury patterns would not be significantly different. Fifth, sociocultural differences can affect the behavioral

characteristics of the riders such as riding under the influence of alcohol, use of protective equipment, or traffic culture. Because the data of this study were collected in a single center of a city, results may not be generalized to different populations. Sixth, the number of the study patients was low for an epidemiological study. A higher number of study population could increase the reliability of results.

Conclusion

The study results suggested that motorcycle and e-bike accidents were more likely to happen in males, especially in the summertime. As a result of motorcycle accidents, the most frequently injured major body parts are the extremities and head and neck region, and the most common type of injuries are soft tissue injuries. Fractures are most commonly seen in the upper extremity. Also, nighttime riding, alcohol or drug use, and lack of protective equipment were found to be related to having multiple trauma. Injuries caused by e-bike accidents and patient outcomes were not significantly different than motorcycle accidents. Mandatory use of protective equipment (helmets, goggles, body-protecting clothing) for motorcycle drivers and passengers, and frequent traffic inspections in summer and at night will contribute to the prevention of accidents. In addition, legal regulations regarding e-bike users need to be expanded. Larger studies with prospective data are needed in this regard.

Conflict of Interest: The authors declare no conflict of interest regarding this study.

Financial Disclosure: This research received no specific grant from any funding agency in the public, commercial, or notfor-profit sectors.

Authors' Contributions: All authors contributed equally to the preparation of the article.

Ethical Approval: Institutional review board approval was obtained for the study approval date: 2019.11.20, 2019/496 decision dated and numbered.

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Analysis of Alcohol Intoxication Cases: Retrospective Demographic Analysis

Alkol Zehirlenmeleri Olgularının İncelenmesi: Retrospektif Demografik Analiz

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ABSTRACT

Aim: Underground alcoholic beverage production and consumption is an important problem in Türkiye and rest of the world. All alcohols, including ethanol, are known to have toxic effects. Patients may admit to emergency services with different clinical manifestations and laboratory findings after exposure to different doses. In this study, it was aimed to evaluate the patients with alcohol intoxication who admitted to the Emergency Medicine Department of Marmara University Pendik Training and Research Hospital.

Material and Methods: This study was carried out retrospectively on patients who admitted to the Emergency Department of Marmara University Pendik Training and Research Hospital between January 2016 and January 2021 due to alcohol poisoning. Demographic data of patients with alcohol intoxication, duration of admission to the hospital, time of admission, way of admission, state of consciousness, whether there was a concurrent different substance intake, whether there was concomitant trauma, blood gas results, whether they received renal replacement therapy and their outcomes were recorded.

Results: During the study period, 149 patients presented to the emergency department with the diagnosis of alcohol poisoning, and 0.5% (n=8) were considered exitus during their follow-up. 88.4% of the patients were male and the mean age was 35.5±12.0 (minimum-maximum, 18-70)/year. A significant age difference was found between the patients who died after alcohol poisoning 49.5 (34.8-63.0) and the patients who survived 33.0 (26-41) in terms of age (p<0.05).

Conclusion: As a result, it was determined that alcohol intoxication is more common in middle-aged men, and it may be mortal in patients with low pH, HCO₃, and increased base deficit and lactate values.

Keywords: Ethanol, methanol, renal replacement therapy, alcoholic intoxication

ÖZ

Amaç: Türkiye’de ve dünyada kayıt dışı alkollü içecek üretimi ve tüketimi önemli bir sorundur. Etanol de dâhil olmak üzere bütün alkollerin toksik etkileri olduğu bilinmektedir. Farklı dozlarda alım sonrası farklı klinik ve laboratuvar bulgularıyla hastalar acil servislere başvurabilmektedir. Bu çalışmada, Marmara Üniversitesi Pendik Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği’ne başvuran alkol zehirlenmesi olan hastaların değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Bu çalışma, Marmara Üniversitesi Pendik Eğitim ve Araştırma Hastanesi Acil Servisi’ne Ocak 2016-Ocak 2021 tarihleri arasında alkol zehirlenmesi nedeniyle başvuran hastalar üzerinde retrospektif olarak yapılmıştır. Alkol zehirlenmesi olan hastaların demografik verileri, hastaneye başvuru süresi, başvuru zamanı, başvuru şekli, şuur durumu, farklı madde alımı olup olmadığı, travma olup olmadığı, kan gazı sonuçları, renal deplasman tedavisi alıp almadıkları ve sonlanımları kaydedildi.

Bulgular: Çalışma dönemi içinde 149 hasta acil servise alkol zehirlenmesi tanısı ile başvurmuş olup, bunların %0,5 (n=8) i takipleri sırasında eksitus kabul edildi. Hastaların % 88,4’ü erkek cinsiyette ve yaş ortalaması 35,5±12,0 (minimum-maksimum, 18-70)/yıl idi. Alkol zehirlenmesi sonrası eksitus olan hastalarla 49,5 (34,8-63,0), hayatta kalan hastalar arasında 33,0 (26-41) yaş bakımından anlamlı fark saptandı (p<0,05).

Sonuç: Sonuç olarak alkol zehirlenmelerinin erkeklerde orta yaş grubunda daha sık görüldüğü, düşük pH, HCO₃ ve artmış baz defisiti ve laktat değerlerine sahip hastalarda ölümcül olabileceği belirlendi.

Anahtar kelimeler: Etanol, metanol, renal replasman tedavisi, alkol intoksikasyonu

Gönderim: 26 Şubat 2023

Kabul: 3 Mayıs 2023

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Atıf için/Cited as: Karacabey S, Korgan MB, Saccak ME, Sanrı E, Denizbaşı AD. Alkol Zehirlenmeleri Olgularının İncelenmesi: Retrospektif Demografik Analiz Anatolian J Emerg Med 2023;6(3):117-120. <https://doi.org/10.54996/anatolianjem.1256632>

Giriş

Alkoller hafif, uçucu, renksiz, yanıcı sıvılardır. Etanol genel tüketim amacıyla kullanılmakla birlikte, yüksek doz alımlarında toksik etkileri ortaya çıktığı bilinmektedir. Diğer alkol türlerinden metil alkol ise etanole çok benzeyen ancak biraz daha tatlı ve odunun damıtılmasının bir yan ürünü olarak üretilen kendine özgü bir kokuya sahip bir alifatik alkoldür (1). Endüstride solvent olarak kullanılmasının yanında ayrıca antifriz solüsyonlarında, fren sıvılarında, karbüratör sıvısında, fotokopi makinelerinde, teksir makinası sıvılarında, boya incelticilerinde, model uçak yakıtı gibi sentetik organik bileşiklerin yapısında bulunmaktadır (2). Etilen glikol, tatlı bir tada sahip, renksiz, kokusuz bir sıvıdır. Zehirlenmelerin çoğu, etilen glikol içeren sıvıların, en yaygın olarak antifrizlerin ağız yoluyla alınmasıyla gerçekleşir. Etanol yerine kullanımı, intihar girişimleri ve kazara yutulmasına bağlı olarak etanol glikol zehirlenmesi ortaya çıkar (3). İzopropanol, temizlik maddelerinde yaygın olarak bulunan bir maddedir ve aynı zamanda ev tipi bir antiseptik olarak da tanımlanmıştır. Modern tıpta kullanılan "alkollü bezlerin" etken maddesidir. İzopropanol maruziyetlerinin çoğu kasıtsızdır ve en yaygın olarak 6 yaşından küçük çocuklarda görülür (4). İntihar girişimlerinde ve etanol yerine kullanımına bağlı olarak başka maruziyetler de bildirilmiştir (5).

Metanol, tek başına sitotoksik olmayıp metabolitleri toksiktir (6,7). Vücut kompartmanlarına dağılımdan sonra ilk olarak alkol dehidrogenaz enzimi (ADH) ile formaldehite dönüştürülür. Formaldehit, metanolden otuz üç kat daha toksik olup aldehit dehidrogenaz enzimi tarafından formik aside hızla dönüştürülür. Daha sonra, formik asit karbondioksite metabolize edilir, ardından vücuttan uzaklaştırılır. Formik asit, ölüme yol açan ciddi metabolik asidozu indükler ve oküler toksisiteden sorumlu primer ajandır. Formik asit vücutta birikmekte olup artan mortalite ve morbiditeyle arasında direkt bir korelasyon bulunmaktadır. Toksikiteye metil alkolün metabolitleri sebep olduğu için, genellikle sindirim ile klinik toksisitenin başlangıcı arasında önemli bir gecikme olmaktadır (8).

Etilen glikol ile gerçekleşen zehirlenmelerin ölüm oranı, alınan miktar ve tedavi süresindeki farklılıklar nedeniyle büyük ölçüde değişir. En yüksek mortalite, en yüksek metabolik asidoz derecesine (pH < 7.1) ve maruz kalma ile tedavinin başlamasına kadar geçen en uzun süreye (> 10 saat) sahip hastalarda bulunur. Etilen glikolün öldürücü dozunun 1,4 – 1,5 mg/kg vücut ağırlığı (70 kg'lık bir yetişkinde yaklaşık 100 mL) olduğu bildirilmiştir. Bununla birlikte, ölümün daha düşük miktarlarda ve hayatta kalmanın daha yüksek konsantrasyonlarda olduğu gösterilmiştir. Metanol gibi, etilen glikol de gastrointestinal kanaldan hızla emilir ve alındıktan sonra 1-2 saat içinde pik serum konsantrasyonlarına ulaşır (3).

İzopropanol, etanolden çok daha hızlı emilir, bu da onu kabaca iki kat sarhoş edici yapar. 100 mg/dL'lik bir izopropanol seviyesi, 200 mg/dL'lik bir etanol seviyesine eşdeğer kabul edilebilir. Metabolik ürünü aseton gibi güçlü bir santral sinir sistemi depresanıdır. ADH yoluyla hızlı dönüşümü nedeniyle, alımdan semptom başlangıcına kadar geçen süre yaklaşık 30 dakikadır. İzopropanol zehirlenmesi olan hastalar baş ağrısı, baş dönmesi, miyotik pupiller, stupor

veya koma ile başvururlar. İzopropanol bir gastrointestinal irritandır ve karın ağrısı, kusma, ishal ve hematemeze neden olabilir (8).

Türkiye'de de rakı tüketimine bağlı gelişen metanol zehirlenmesi sonucu birçok ölüm olgusu bildirilmiştir. İçkilerin içerik analizi Türk Gıda Kodeksi Yönetmeliği'ne göre hazırlanmış çeşitli tebliğlerde yer alan ölçütler doğrultusunda yapılmaktadır. Ancak, tüm dünyada olduğu gibi, Türkiye'de de kayıt dışı alkollü içecek üretimi ve tüketimi önemli bir sorundur. Bu çalışmada, Marmara Üniversitesi Pendik Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği'ne başvuran alkol zehirlenmesi olan hastaların değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler

Bu çalışma, Marmara Üniversitesi Pendik Eğitim ve Araştırma Hastanesi Acil Servisine alkol alımı veya maruziyeti nedeniyle başvuran ve etanol, metanol ve diğer toksik alkoller ile meydana gelen zehirlenmeler nedeniyle merkezimizde takip edilen hastalar üzerinde retrospektif olarak yapılmıştır. Çalışma için yerel etik kurul onayı alınmış (Marmara Üniversitesi Tıp Fakültesi Girişimsel Olmayan Araştırmalar Etik Kurulu, tarih: 11.03.2021, sayı no: 2021.02.17) ve çalışma boyunca Helsinki Bildirisi'ne bağlı kalmıştır.

Hasta kayıtlarına arşiv verilerinden ve bilgi işlem otomasyon sisteminden ulaşıldı. Ocak 2016-Ocak 2022 tarihleri arasında alkol zehirlenmesi olan hastaların demografik verileri, hastaneye başvuru süresi, başvuru zamanı, başvuru şekli, şuur durumu, farklı madde alımı olup olmadığı, travma olup olmadığı, kan gazı sonuçları, hemodiyaliz alıp almadıkları ve sonlanımları kaydedildi. Hastalar alkol zehirlenmesi sonrası klinik sonlanımlarına göre eksitus olanlar ve hayatta kalanlar (taburcu olanlar) olmak üzere 2 farklı gruba ayrıldı. Dosya verileri eksik olanlar ve 18 yaş altı hastalar çalışma dışı bırakıldı.

İstatistiksel Analiz

Elde edilen veriler SPSS 21.0 (IBM Corp., Armonk, NY, USA) programı ile analiz edildi. Normal dağılım gösteren sürekli değişkenler ortalama±standart sapma, normal dağılmayan sürekli değişkenler ortanca (minimum-maksimum), nitel değişkenler ise sayı (n), frekans (%) şeklinde ifade edildi. Değişkenlerin normallik analizi Shapiro-Wilk testi kullanılarak yapıldı. Gruplar arasında başvuru şikayetlerinin karşılaştırılmasında Ki-kare testi, FM bulguları ve laboratuvar sonuçlarının normal dağılıma uyan sürekli değişkenlerinin karşılaştırılmasında Student t-testi, uymayan sürekli değişkenlerin karşılaştırılmasında ise Mann-Whitney U testi kullanıldı. p<0.05 değeri istatistiksel olarak anlamlı kabul edildi.

Bulgular

Çalışma dönemi içinde 149 hasta acil servise alkol zehirlenmesi tanısı ile başvurmuş olup, bunların %0,5 (n=8)'i takipleri sırasında eksitus kabul edildi. Hastaların % 88,4'ü erkek cinsiyette ve yaş ortalaması 35,5±12,0 (minimum-maksimum, 18-70)/yıl idi. Alkol zehirlenmesi sonrası eksitus olan hastalarla 49,5(34,8-63,0), hayatta kalan hastalar arasında 33,0(26-41) yaş bakımından anlamlı fark saptandı (p<0,05). Hastaların %59,2'si acil servise ambulansla başvurmuş olup, %63,3'ünün gece başvurduğu; %56,5'inin

hafta sonu başvuruda bulunduğu; %41,5'inin başvuru süresi alkol alımından sonraki ilk 6 saatlik sürede hastaneye geldiği tespit edildi. Alkol ile birlikte ek madde alımı veya maruziyeti hastaların %11,4'ünde tespit edilirken; %12,1'inde travmanın eşlik ettiği tespit edildi. Hastaların %25,9'u hemodiyalize alındı (Tablo 1). Alkol zehirlenmesi olan hastaların başvuru anındaki kan gazı değerlendirmesinde bakılan parametreler ve mortaliteyle ilişkisi Tablo 2'de, son bakılan kan gazı değerleri ve mortalite ilişkisi ise Tablo 3'te verilmiştir.

	n (%)		n (%)
Cinsiyet		Alımın Kaçınıcı Saati	
Erkek	130 (88,4)	0-6	61 (41,5)
Kadın	17 (11,6)	6-12	26 (17,7)
Başvuru Şekli		12-24	18 (12,2)
Ayaktan	40 (27,2)	>24	42 (28,6)
Ambulans	87 (59,2)	Ek Madde Alımı/Maruziyeti	
Sevk	20 (13,6)	Yok	130 (88,4)
Başvuruda Bilinç		İnhaler Madde (Esrar, Bonzai vs.)	10 (5,8)
Açık	72 (49,0)	Mantar	4 (2,7)
Uykuya Meyilli	46 (31,3)	Parasetamol	1 (0,7)
Koma	29 (19,7)	Çoklu ilaç	2 (1,4)
Başvuru Saati		Travma Öyküsü	
Gündüz	54 (36,7)	Var	18 (12,2)
Gece	93 (63,3)	Yok	129 (87,8)
Başvuru Günü		Hemodiyaliz	
Haftaiçi	64 (43,5)	Uygulandı	38 (25,9)
Haftasonu	83 (56,5)	Uygulanmadı	109 (74,1)

Tablo 1. Alkol Zehirlenmesi ile Başvuran Hastaların Demografik Özellikleri

Tartışma

Son yıllarda alkol ürünlerinin fiyatlarındaki artış ve pandemi nedeniyle alkol ürünleri satışına getirilen kısıtlamalar, insanları evde kendi alkollerini üretmeye veya merdiven altı olarak tabir edilen ve fiyatı daha uygun olan "sahte içki" tüketimine yönlendirmektedir (1,2,9-11). Bu da alkol zehirlenmelerinde özellikle metil alkole bağlı olan vakalarla önümüzdeki dönemlerde de karşılaşma olasılığının artacağını düşündürmektedir. Alkol ürünlerinin tüketimi birçok toplumda dini, kültürel ya da yasal olarak önlenmeye çalışılsa da halen çok sayıda alkol ile zehirlenme vakasıyla karşılaşmaktadır (2,7,12,13,14-18). Bu vakaları çoğunlukla orta yaş grubundaki erkekler oluşturmakta ve bunun nedeni erkeklerde alkol tüketiminin kadınlara göre daha sık olması ile açıklanmaktadır (2,19). Çok merkezli bir çalışmada, metanol zehirlenmesinde erkek cinsiyetin dominant

	Taburcu	Eksitus	p
pH	7,36 (7,32-7,40)	7,09 (6,86-7,18)	<0,001
pCO₂ (mmHg)	42,0 (38,0-48,0)	38,5 (26,3-59,8)	0,73
HCO₃ (mmHg)	23,1 (19,2-25,1)	5,55 (5,38-6,92)	<0,001
Laktat (mmol/L)	2,70 (2,10-3,70)	7,05 (4,58-10,10)	<0,001
Baz Açığı	-2,0 (-7,1- -0,4)	-24,2 (-25,1- -23,9)	<0,001

pCO₂: Parsiyel karbondioksit basıncı, HCO₃: Bikarbonat

* İstatistiksel olarak anlamlı değerler kalın font ile gösterilmiştir.

Tablo 2. Başvuru esnasında kan gazı değerlerinin mortaliteyle ilişkisi

olduğunu ve yaş grubunun sıklıkla 42-44/yıl arasında kümelendiğini rapor edilmiştir (13).

Ülkemizde yapılan çalışmalara baktığımızda ise Yayı ve ark., metanol zehirlenmesinin sıklıkla erkeklerde ve en sık 36-40 yaş grubunda gerçekleştiğini ve bunu 41-45 yaş grubunun izlediği; Gülen ve ark. ise vakalarının %95,5'inin erkek ve yaş ortalamasının 48.41±13.1/yıl olduğunu bildirmiştir (2,19). Bir başka çalışmada, alkol ürünlerine bağlı zehirlenmeler sonucu hayatını kaybeden on binden fazla vakanın otopsi sonuçlarını değerlendirilmiş ve kurbanların %90,5'nin erkek olduğu ve zehirlenmelerin en sık 35-49 yaş grubunda görüldüğü rapor edilmiştir (20).

	Taburcu	Eksitus	p
pH	7,36 (7,35-7,38)	7,36 (7,33-7,38)	0,447
pCO₂ (mmHg)	41,0 (38,0-42,0)	38,5 (38,0-42,3)	0,606
HCO₃ (mmHg)	24,4 (21,3-24,9)	21,4 (20,1-22,8)	0,067
Laktat (mmol/L)	2,0 (1,3-2,5)	2,35 (1,57-2,97)	0,355
Baz Açığı	-0,6 (-2,0- 0,4)	-2,45 (-3,25- -0,80)	0,058

pCO₂: Parsiyel karbondioksit basıncı, HCO₃: Bikarbonat

Tablo 3. Hastaların son kan gazı değerleri

Bizim çalışmamızda da benzer şekilde orta yaş grubu erkek cinsiyetin daha ön planda alkol zehirlenmesi sebebiyle acil servise başvurduğu gözlenmiştir.

Çalışmalar, alkol zehirlenmelerinde özellikle metil alkol zehirlenmelerinde, hastalarda özellikle asit-baz dengesi ile ilgili laboratuvar sonuçlarının sağkalım ve prognozu belirlemede kullanılabileceğini göstermektedir. Artan formik asit ve laktatın neden olduğu derin asidoz (pH düşüşü), asidozu dengelemek için azaltılmaya çalışılan parsiyel karbondioksit basıncı (PaCO₂) (hiperventilasyon yeteneği göstergesi), hızla tükenen bikarbonat, artan osmolalite, anyon açığı ve baz defisiti, hiperglisemi ve kreatinin artışı gibi laboratuvar değişkenleri bu belirteçlere örnek olarak

gösterilebilir (1,2,8,10,12,13,21). Liu ve ark., metil alkol zehirlenmesi olan hastalarda pH'nin 7'nin altına inmesini ölümcül sınır değer olarak kabul ederken, Roberts ve ark.'nin ise ölümcül pH aralığını 6.64 - 7.29 olarak tanımlamıştır (8,28). Bir başka çalışmada metil alkol zehirlenmesi olguları "ölenler, sekelle iyileşenler ve sekelsiz iyileşenler" olarak 3 grupta incelemiş ve ölen gruptaki hastaların pH ve bikarbonat düzeylerinin diğer gruplara göre çok daha düşük; baz defisiti, PaCO₂ ve kreatinin değerlerinin ise çok daha yüksek olduğu bildirmiştir (17).

Ülkemizde yapılan bir çalışmada Gülen ve ark., metil alkol zehirlenmesi sonrası yüksek anyon açıklı metabolik asidoz ve artmış laktat düzeylerinin kötü klinik sonlanımla ilişkisi olduğunu göstermiştir (2).

Çalışmamızda ölen hastaların baz defisitinin ve laktat düzeylerinin hayatta kalan hastalara göre anlamlı düzeyde arttığı; pH, bikarbonat düzeylerinin ise anlamlı düzeyde azaldığı tespit edilmiştir. Ancak PaCO₂ düzeylerinde anlamlı bir fark olmadığı görülmüştür. Elde ettiğimiz bu sonuçlar, alkol zehirlenmelerinde sağkalımla ilişkilendirilen laboratuvar sonuçları konusunda daha önce yapılan çalışmalarda elde edilen verileri desteklemektedir.

Sonuç

Sonuç olarak alkol zehirlenmesinin erkeklerde orta yaş grubunda daha sık görüldüğü, düşük pH, HCO₃ ve artmış Baz eksisi ve laktat değerlerine sahip hastalarda mortal olabileceği belirlendi. Alkol zehirlenmelerinin genel değerlendirilmesi, takibi ve tedavileri ile alakalı daha geniş kapsamlı çalışmaların daha etkili sonuçlar vereceği düşüncesindeyiz.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Bu çalışma herhangi bir finansal destek almamıştır.

Yazar Katkısı: Yazarlar yazının hazırlanmasında eşit olarak katkı sunmuşlardır.

Etik Kurul Onayı: Çalışmamız Marmara Üniversitesi Tıp Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu tarafından onaylandı (Tarih: 11.03.2021, Sayı no: 2021.02.17). Çalışma Helsinki Deklarasyonu prensiplerine uygun olarak gerçekleştirilmiştir.

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The Effect of Quality of Life on Perceived Stress in Emergency Service Healthcare Professionals in the Period of COVID-19

Acil Servis Sağlık Çalışanlarında COVID-19 Dönemindeki Yaşam Kalitesinin Algılanan Strese Etkisi

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ABSTRACT

Aim: The aim of the study is to examine the effect of the quality of life of healthcare workers in the emergency service on perceived stress during the COVID-19 pandemic.

Material and Methods: The population of the study consists of 265 people. It was aimed to reach the whole population without sampling and 201 people could be reached. Research data were collected by face-to-face interview method using a questionnaire. The questionnaire form consists of 3 parts: participant information form, COV19-QoLTR scale and perceived stress scale. In the analysis of the data, parametric tests were used with the help of IBM SPSS 27 program.

Results: 57.7% of the research participants are women, 47.8% are undergraduates, 63.2% are nurses, 70.6% are working for 5 years or less, and 83.1% are shift workers. In the study, it was observed that the COV19-QoLTR score averages of those who were married, those who were above the average age, and those who had lost a relative due to the pandemic were significantly higher. In addition, it has been revealed that the personnel working in shifts have higher scores on the perceived stress scale than those working in fixed shifts, and the doctors according to the nurses and other health workers.

Conclusion: As a result of the study, it was determined that the negative impact of the COVID-19 pandemic on the quality of life of emergency health workers significantly affected and increased the perceived stress.

Keywords: COVID-19, quality of life, stress, emergency service

ÖZ

Amaç: Araştırmanın amacı, COVID-19 pandemisinde acil serviste görevli sağlık çalışanlarının yaşam kalitesinin algılanan stres üzerine etkisini incelemektir.

Gereç ve Yöntemler: Araştırmanın evreni 265 kişiden oluşmaktadır. Örneklem yapılmadan tüm evrene ulaşılması hedeflenmiş ve 201 kişiye ulaşılabilmektedir. Araştırma verileri anket formu kullanılarak yüz yüze görüşme yöntemi ile toplanmıştır. Anket formu katılımcı bilgi formu, COV19-QoLTR ölçeği ve algılanan stres ölçeği olmak üzere 3 bölümden oluşmaktadır. Verilerin analizinde IBM SPSS 27 programı yardımıyla parametrik testlerden yararlanılmıştır.

Bulgular: Araştırma katılımcılarının %57,7'sini kadınlar, %47,8'ini lisans mezunu kişiler, %63,2'sini hemşireler, %70,6'sını 5 yıl ve daha az süredir çalışanlar ve %83,1'ini vardiyalı çalışanlar oluşturmaktadır. Araştırmada evli olanların, ortalama üstünde yaşa sahip olanların ve pandemi sebebiyle bir yakınını kaybetmiş olanların COV19-QoLTR puan ortalamalarının anlamlı düzeyde daha yüksek olduğu görülmüştür. Ayrıca vardiyalı çalışan personelin sabit mesai çalışanlara göre ve doktorların da hemşire ve diğer sağlık personeline göre algılanan stres ölçeğinden daha yüksek puanlara sahip olduğu ortaya konmuştur.

Sonuç: Araştırma sonucunda acil sağlık çalışanlarında COVID-19 pandemisinin yaşam kalitesi üzerindeki olumsuz etkisinin algılanan stresi anlamlı şekilde etkilediği ve artırdığı tespit edilmiştir.

Anahtar Kelimeler: COVID-19, yaşam kalitesi, stres, acil servis

Gönderim: 22 Kasım 2022

Kabul: 26 Mayıs 2023

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Atıf için/Cited as: Oflaz A, Filiz E, Erişen MA. Acil Servis Sağlık Çalışanlarında COVID-19 Dönemindeki Yaşam Kalitesinin Algılanan Strese Etkisi. Anatolian J Emerg Med 2023;6(3):121-127. <https://doi.org/10.54996/anatolianem.1207983>

Giriş

Koronavirüs (COVID-19), ilk olarak insan solunum sistemine yönelerek hastalık oluşturan virüslerden biridir. SARS-CoV-2 virüsünün neden olduğu koronavirüs hastalığı, ilk olarak Çin Halk Cumhuriyeti'nde ortaya çıkıp tüm dünyayı etkisine alarak uluslararası öneme sahip bir halk sağlığı acil durumu olarak ilan edilen bulaşıcı bir viral enfeksiyondur (1). COVID-19 pandemisinde yaşanan gelişmeler üzerine tüm dünyada panik ve kaos oluşmaya başlamıştır. Vakalar ve ölümlerin artması nedeniyle ülkelerin, sağlık sistemlerinde ciddi önlemler alması gerekmiş ve hastaneler çok sayıda COVID-19 vakasını kabul etmek zorunda kalmıştır. Tüm dünyayı etkisi altına alan COVID-19 salgını sağlık, sosyal, ekonomi, çevre gibi birçok alanı da etkilemiştir. Küresel olarak, 14 Ekim 2022'ye kadar Dünya Sağlık Örgütü'ne bildirilen 6.543.138 ölüm dâhil 620.878.405 onaylanmış COVID-19 vakası bulunurken (2), aynı tarihte Türkiye'de Sağlık Bakanlığı'na bildirilen 101.203 ölüm dâhil 16.919.638 onaylanmış COVID-19 vakası tespit edilmiştir (3).

Dünya Sağlık Örgütü (DSÖ) yaşam kalitesini, insanların kültürlerine, değerlerine, amaçlarına ve hayata dair beklentileri doğrultusunda karşılaştıkları bir yaşam standardı olarak tanımlamaktadır (4). Hayattan zevk alan, hastalıktan arı ve aktif bir sosyal hayata sahip insanlar, sağlıklı insanların yaşam kalitesi için rol modelidir (5). Yaşam kalitesi, insanların performansını, fiziksel ve zihinsel refahını, güçlü aile bağlarını ve sosyal ilişkilerden doyumunu en üst düzeye çıkarmaktadır. Konuyla ilgili öğretmenler üzerinde Rabacal ve arkadaşları tarafından yapılan çalışmaya göre, COVID-19 salgını öğretmenlerin yaşam kalitesi üzerinde geniş kapsamlı bir etkiye sahip olduğu bildirilmektedir (6). Kaya ve arkadaşları tarafından yapılan çalışmaya göre, COVID-19 pandemisi hemşirelerin profesyonel performansı, iş tatmini ve profesyonel yaşam kalitesi üzerinde olumsuz bir etki yarattığı sonucuna ulaşmışlardır (7). Dünya çapında 3002 kişi üzerinde çevrimiçi ortamda gerçekleştirilen başka bir araştırmada, COVID-19'un yaşam kalitesi üzerindeki olumsuz etkisi ile algılanan stres arasında pozitif yönde anlamlı bir ilişki olduğu ortaya konulmuştur (8). Algılanan stres ise bireylerin belirli bir zaman veya dönemde yaşadıkları stresin miktarı hakkındaki düşünceleri veya görüşleridir. Algılanan stres, bir kişinin yaşamının doğallığı, zor sorunları ne sıklıkta yönetmek zorunda oldukları, yaşamlarında kaç değişiklik meydana geldiği ve sorunları veya sorunları yönetme yeteneklerine olan güvenleri ile yakından ilişkilidir (9). Bu, bir kişide meydana gelen stresli durumların türlerinin veya sıklığının bir tahmini değil, bireylerin şimdiye kadar yaşamlarının genel streslerine nasıl tepki verdikleri ve bu stresle başa çıkma yeteneği olarak ifade edilmektedir (10). COVID-19 salgını sırasında yoğun bakım hemşireleri üzerinde yapılan bir araştırmada, algılanan stresin yaşam kalitesinin hem fiziksel hem de zihinsel bileşenlerini etkilediği ortaya konmuştur (11).

Acil servisler hastanelerde kesintisiz olarak hasta kabulünün yapıldığı birimlerdir. Genel anlamda COVID-19 pozitifliği/şüphesi olan hastalar teşhis ve tedavi amaçlı ilk olarak acil servislere başvuru yapmaktaydı. Bu kritik durumla karşı karşıya kalan sağlık kuruluşları, özellikle hastanelerde kesintisiz olarak hasta kabulünün yapıldığı acil servislere çalışan sağlık profesyonelleri, COVID-19 pozitifliği/şüphesi

olan hastaları ve diğer hastalıkları olan hastaları tedavi etmek için büyük bir mücadele vermişlerdir. Dolayısıyla COVID-19 pandemisinde acil servis sağlık çalışanlarının yaşam kalitesi ve algılanan stres düzeylerinin daha fazla etkileneceği düşünülmüştür. Bu bağlamda çalışma, COVID-19 salgını sırasında acil serviste görevli sağlık çalışanlarının yaşam kalitesinin algılanan stres üzerine etkisini incelemeyi amaçlamıştır.

Gereç ve Yöntemler

Araştırmada nicel yöntemlerden yararlanılarak tanımlayıcı nitelikte bulgular ortaya konulmuştur.

Araştırmanın evrenini İç Anadolu bölgesinde faaliyet gösteren bir kamu hastanesinin acil servisinde çalışan 265 sağlık çalışanı oluşturmaktadır. Araştırmada örnekleme yapılmamış olup tüm evrene ulaşılması hedeflenmiştir. Bu bağlamda evrenin %75,8'i araştırmaya katılmayı kabul etmiş ve araştırmanın örneklemini 201 acil servis çalışanı oluşturmuştur.

Araştırma verileri anket yöntemi kullanılarak toplanmıştır. Kullanılan anket formu üç bölümden oluşmaktadır. İlk bölümde 12 sorudan oluşan katılımcıların özellikleri hakkındaki demografik ve tanımlayıcı sorular yer almaktadır. İkinci bölümde Repisti ve arkadaşları tarafından geliştirilen ve Sümen ve Adibelli tarafından Türk kültürüne uyarlanan COVID19'un Yaşam Kalitesine Etkisi (COV19-QoLTR) ölçeği kullanılmıştır (12, 13). COV19-QoLTR ölçeği altı ifade ve tek boyuttan oluşan, beşli likert tipinde (1-Kesinlikle katılmıyorum, 5- Kesinlikle katılıyorum) hazırlanmış bir ölçektir. Ölçekten alınan puan 1 ile 5 aralığında değişmekte ve alınan puanın artması, pandeminin kişinin yaşam kalitesini kötüleştirdiğini göstermektedir. COV19-QoLTR ölçeğinin Cronbach alfa değeri 0,853 olarak bulunmuştur. Anket formunun üçüncü ve son bölümünde ise Cohen ve arkadaşları tarafından geliştirilen ve Bilge ve arkadaşları tarafından Türk kültürüne uyarlanan Algılanan Stres Ölçeği (ASÖ) kullanılmıştır (10, 14). ASÖ beşli Likert tipinde (0-hiç, 4-Çok sık) hazırlanmış ve 8 ifadeden oluşan bir ölçektir. Algılanan stres ve algılanan baş etme olmak üzere iki alt boyuttan oluşmaktadır. Ölçek hem toplam puan hem de alt boyut puanları üzerinden değerlendirilmektedir. Ölçeğin toplam puanı 0 ile 32 arasında değişmekte ve toplam puanın artması algılanan stres düzeyinin yüksek olmasını ifade etmektedir. Ayrıca alt ölçek puanlarının yüksekliği de olumsuz durumu ifade etmektedir. ASÖ ölçeğine ait Cronbach alfa değeri 0,789 olarak bulunmuştur. Araştırmada kullanılan her iki ölçeğin iç tutarlılık katsayısı da ölçeklerin oldukça güvenilir olduğunu göstermektedir (15).

Veriler 2021 yılının son üç ayı içerisinde katılımcılarla yüz yüze görüşülerek toplanmıştır. Verilerin analizinde IBM SPSS 27 paket programı kullanılmıştır. Verilerin analizinde frekans, yüzde, ortalama gibi tanımlayıcı analizlere ek olarak parametrik testlerden bağımsız örneklemlerde t testi, tek yönlü varyans analizi ve doğrusal regresyon analizi kullanılmıştır. Tek yönlü varyans analizinde anlamlı farkın hangi gruptan kaynaklandığının tespiti için post hoc testlerinden Scheffe kullanılmıştır. Analizler %95 güven aralığında ve $p < 0,05$ anlamlılık düzeyinde gerçekleştirilmiştir.

Araştırmanın etik kurul onayı Selçuk Üniversitesi Sağlık Bilimleri Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulundan 18.08.2021 tarih ve 2021/986 karar numarası ile alınmıştır. Buna ek olarak Sağlık Bakanlığı COVID-19 Bilimsel Araştırma Değerlendirme Komisyonu ve araştırmanın yapıldığı kurumdan izin alınmıştır. Ayrıca anket uygulamadan önce araştırmanın katılımcılarından da gönüllü onam alınmıştır.

Bulgular

Bu bölümde araştırmanın normallik, demografik ve yapılan diğer analiz bulgularına yer verilmiştir.

Verilerin normallik testi sonucunda ölçeklere ait Skewness değerlerinin “-0,61” ile “+0,21” aralığında; Kurtosis değerlerinin ise “-0,30” ile “+0,31” aralığında olduğu tespit edilmiştir. Plichta ve Kelvin (16) verilerin normal dağıldığını söyleyebilmek için Skewness ve Kurtosis değerlerinin $\pm 1,96$ aralığında olması gerektiğini ifade etmiştir. Dolayısıyla araştırma verilerinin normal dağıldığı görülmektedir. Bu bağlamda fark ve regresyon analizlerinde parametrik testler kullanılmıştır.

Toplamda 201 kişiden oluşan katılımcıların demografik bulguları ve katılımcılara ait hastalık ve pandemiye ilişkin tanımlayıcı bulgular Tablo 1’de gösterildiği gibidir.

Katılımcıların demografik ve tanımlayıcı özelliklerine göre COV19-QoLTR ve ASÖ puan ortalamalarının karşılaştırıldığı bağımsız örneklemelerde t-testi ve tek yönlü varyans analizi bulguları Tablo 2’deki gibidir.

Analiz sonuçlarında cinsiyet, çalışma şekli, COVID-19 geçirme durumu ve meslek bağımsız değişkenlerine göre katılımcıların COV19-QoLTR puan ortalamalarında istatistiksel açıdan anlamlı bir fark olmadığı tespit edilmiştir ($p>0,05$). Ancak medeni durum, yaş ve COVID-19 nedeniyle bir yakını kaybetme durumu bağımsız değişkenlerine göre katılımcıların COV19-QoLTR puan ortalamalarında istatistiksel açıdan anlamlı fark olduğu görülmüştür ($p<0,05$). Buna göre evli bireylerde COVID-19’un yaşam kalitesi üzerindeki olumsuz etkisinin daha fazla olduğu tespit edilmiştir. Yine ortalama ($28,79\pm 7,13$) üzerinde bir yaşta olan bireylerde COVID-19’un yaşam kalitesi üzerindeki olumsuz etkisinin daha fazla olduğu görülmüştür. Son olarak COVID-19 sebebiyle bir yakını kaybetmiş olan bireylerde COVID-19’un yaşam kalitesi üzerindeki olumsuz etkisinin daha fazla olduğu tespit edilmiştir.

Değişkenler (n=201)		n	%
Cinsiyet	Erkek	85	42,3
	Kadın	116	57,7
Medeni Durum	Evli	87	43,3
	Bekar	114	56,7
Yaş (Ort \pm SS=28,79 \pm 7,13 min-maks=21,0-55,0)	Ortalamanın altında	142	70,6
	Ortalamanın üstünde	59	29,4
	Lise	21	10,4
Eğitim Durumu	Ön Lisans	44	21,9
	Lisans	96	47,8
	Lisans üstü	40	19,9
	Hemşire	127	63,2
Mesleği	Doktor	35	17,4
	Diğer sağlık personeli (ATT, Sağlık memuru ve ortopedi teknikeri)	39	19,4
Meslekteki çalışma yılı	5 yıl ve daha az	142	70,6
	5 yıldan daha fazla	59	29,4
Çalışma şekli	Sabit mesai (sürekli gündüz/gece)	34	16,9
	Vardiya	167	83,1
Kronik hastalık bulunma durumu	Evet	24	11,9
	Hayır	177	88,1
COVID-19 teması olup test yaptırdınız mı?	Evet	141	70,1
	Hayır	60	29,9
COVID-19 hastalığını geçirdiniz mi?	Evet	111	55,2
	Hayır	90	44,8
Çalışma arkadaşlarınızda COVID-19 geçiren oldu mu?	Evet	188	93,5
	Hayır	13	6,5
COVID-19 nedeniyle herhangi bir yakını kaybettiniz mi?	Evet	59	29,4
	Hayır	142	70,6

Tablo 1: Tanımlayıcı bulgular

Bağımsız Değişken	n	COVID-19-QoLTR (Ort±S.S.)	ASÖ (Ort±S.S.)	Algılanan Stres (Ort±S.S.)	Algılanan Baş Etme (Ort±S.S.)	
Cinsiyet	Erkek	85	3,66±0,91	17,86±5,61	11,71±4,32	6,15±2,54
	Kadın	116	3,57±0,85	17,41±5,65	11,29±4,28	6,12±2,30
	t		0,669	0,553	0,673	0,094
	p		0,504	0,581	0,502	0,925
Medeni Durum	Evli	87	3,81±0,84	18,30±4,95	11,99±4,02	6,31±2,32
	Bekar	114	3,46±0,87	17,07±6,06	11,07±4,46	6,00±2,46
	t		2,856	1,540	1,508	0,908
	p		0,005	0,125	0,133	0,365
Yaş	Ortalama Altı	142	3,51±0,82	17,55±5,81	11,42±4,37	6,13±2,44
	Ortalama Üstü	59	3,84±0,96	17,73±5,19	11,58±4,14	6,15±2,32
	t		-2,502	-0,206	-0,231	-0,069
	p		0,013	0,837	0,818	0,945
Çalışma Şekli	Sabit Mesai (Sürekli gündüz / gece)	34	3,43±1,10	15,24±5,23	9,62±4,94	5,62±2,85
	Vardiyalı	167	3,65±0,82	18,08±5,59	11,84±4,06	6,24±2,29
	t		-1,098	-2,735	-2,804	-1,381
	p		0,279	0,007	0,006	0,169
COVID-19 geçirdiniz mi?	Evet	111	3,68±0,81	17,69±5,72	11,67±4,24	6,03±2,37
	Hayır	90	3,53±0,94	17,49±5,53	11,22±4,37	6,27±2,44
	t		-1,210	-0,256	-0,729	0,703
	p		0,228	0,798	0,467	0,483
COVID-19 nedeniyle bir yakınını kaybetme durumu	Evet	59	3,86±0,82	18,17±5,21	12,36±3,90	5,81±2,42
	Hayır	142	3,50±0,88	17,37±5,79	11,10±4,41	6,27±2,38
	t		-2,688	-0,922	-1,904	1,223
	p		0,008	0,358	0,058	0,223
Meslek	Hemşire ^a	127	3,57±0,87	17,43±5,60	11,32±4,37	6,10±2,39
	Doktor ^b	35	3,80±0,67	20,11±5,21	13,17±3,88	6,94±1,88
	Diğer Sağlık Personeli ^c	39	3,56±1,03	15,92±5,44	10,41±4,05	5,51±2,69
	F		1,018	5,532	4,140	3,386
	p		0,363	0,005	0,017	0,036
Fark (scheffe)		-	b>a,c	b>c	b>c	

ASÖ: Algılanan Stres Ölçeği

Tablo 2: Katılımcıların tanımlayıcı özelliklerine göre ölçek ortalamalarının karşılaştırması.

Algılanan stres ölçeği puan ortalamaları incelendiğinde ise cinsiyet, medeni durum, yaş, COVID-19 geçirme durumu ve COVID-19 nedeniyle bir yakınını kaybetme durumu bağımsız değişkenlerine göre katılımcıların ASÖ, algılanan stres ve algılanan baş etme puan ortalamalarında istatistiksel açıdan anlamlı bir fark olmadığı görülmektedir ($p>0,05$). Yine katılımcıların çalışma şekline göre algılanan baş etme puanlarında anlamlı bir fark bulunmamıştır ($p>0,05$). Ancak katılımcıların çalışma şekline göre ASÖ ve algılanan stres puan ortalamalarında; mesleklerine göre ise ASÖ, algılanana stres ve algılanan baş etme puan ortalamalarında anlamlı fark tespit edilmiştir ($p<0,05$). Buna göre vardiya usulüne göre çalışan kişilerin ASÖ ve algılanan stres puan ortalamalarının sabit mesai ile çalışanlarınkine göre anlamlı düzeyde daha yüksek olduğu görülmüştür. Mesleğe göre algılanan stres ölçeği ve alt boyutlardaki farkların hangi gruplardan kaynaklandığının tespiti için post hoc testlerinden scheffe testi uygulanmıştır. Scheffe testi sonucuna göre ASÖ puan ortalamasındaki farkın doktorların hemşire ve diğer sağlık personellerine göre daha fazla algılanan strese sahip olmasından; algılanan stres alt boyutundaki farkın doktorların diğer sağlık personeline göre daha fazla stresli hissetmesinden ve algılanan baş etme alt boyutundaki farkın ise doktorların diğer sağlık personeline

göre baş etmede daha fazla zorluk hissetmesinden kaynaklandığı tespit edilmiştir.

Tablo 3'te acil sağlık çalışanlarının COVID-19 dönemindeki yaşam kalitesinin algılanan stres üzerine etkisini gösteren doğrusal regresyon analizi bulgularına yer verilmiştir. Buradaki regresyon modeline göre COVID-19-QoLTR bağımsız değişken, ASÖ ise bağımlı değişken olarak kullanılmıştır. Analiz sonucunda COVID-19 dönemindeki yaşam kalitesinin, algılanan stres üzerinde istatistiksel açıdan anlamlı bir etkisinin olduğu tespit edilmiştir ($F=58,595$; $p=<0,001$). Ayrıca regresyon katsayısına göre ($\beta =0,477$) bu ilişkinin pozitif yönlü orta düzeyde olduğu ve COVID-19-QoLTR'nin algılanan stresi açıklamadaki etkisinin %22,7 olduğu ortaya koyulmuştur. Bu bağlamda regresyon modelinin formülü " $Y=6,519+3,071X_{\text{COVID-19-QoLTR}}$ " şeklinde verilebilecektir. Bu formüle göre ise COVID-19'un yaşam kalitesi üzerindeki etkisinde gerçekleşecek her bir birim artışın algılanan stresi 3,071 seviyesinde artıracığı söylenebilir. Diğer bir anlatımla COVID-19 pandemisinin yaşam kalitesi üzerindeki olumsuz etkisinin artması algılanan stres düzeyinin de artmasına neden olmaktadır.

	Standardize edilmemiş		Standardize edilmiş	t	p	R	R ²	F	p
	katsayılar		katsayılar						
	B	S H	β						
(Sabit)	6,519	1,490		4,376	<0,001				
COVID-19-QoLTR	3,071	0,401	0,477	7,655	<0,001	0,477	0,227	58,595	<0,001

Bağımlı Değişken: Algılanan Stres Ölçeği

Tablo 3: COVID-19 Dönemindeki Yaşam Kalitesinin Algılanan Stres Üzerine Etkisi.

Tartışma

COVID-19 pandemisi insanları, kurumları, ülkeleri kısacası küresel anlamda herkesi olumsuz yönde etkilemiştir. Tüm dünyayı etkisi altına alan pandemide en büyük görevlerden birisi de sağlık çalışanlarına düşmüştür. Öyle ki COVID-19 şüphesi ile sağlık kuruluşlarına gelen kişilerin ilk başvurduğu yer sağlık kuruluşlarının acil servisleri olmuştur. Dolayısıyla küresel çaptaki pandeminin acil serviste görev yapan sağlık çalışanları açısından önemli derecede yıpratıcı etkileri olmuştur. Bu bağlamda araştırmada acil servisteki sağlık çalışanlarında COVID-19'un yaşam kalitesi üzerindeki etkisinin algılanan strese etkisi incelenmiştir. Ayrıca araştırmada tanımlayıcı ve demografik değişkenlere göre COVID-19 pandemisinin yaşam kalitesi üzerindeki etkisinde ve algılanan strese farklılık olup olmadığı test edilmiştir.

Araştırmada cinsiyet, çalışma şekli, COVID-19 geçirme durumu ve meslek bağımsız değişkenlerine göre katılımcıların COVID-19-QoLTR puanlarında anlamlı fark olmadığı görülmüştür. Ancak buna ek olarak evli bireylerin, yaşı ortalama üstünde olan bireylerin ve COVID-19 sebebiyle bir yakını kaybeden bireylerin yaşam kalitesinin COVID-19 pandemiden anlamlı düzeyde daha fazla olumsuz etkilendiği tespit edilmiştir. Bu alanda yapılan çeşitli çalışmalar incelendiğinde cinsiyete göre, çalışma şekillerine göre, COVID-19 geçirme durumuna göre katılımcıların yaşam kalitesi puanlarında fark tespit edilmeyen araştırmalar mevcuttur (17-21). Buna ek olarak bu çalışma ile benzer şekilde COVID-19 sebebiyle bir yakını kaybeden veya yakını enfekte olan katılımcıların daha kötü yaşam kalitesi puanlarına sahip olduğunu gösteren araştırmalar bulunmaktadır (21-23). Medeni duruma göre bu çalışmanın aksine Dehkordi ve arkadaşları bekarların COVID-19-QoL puanlarının daha yüksek olduğunu bulmuşken, evli bireylerin daha yüksek COVID-19-QoL puanına sahip olduğunu gösteren araştırmalar da mevcuttur (20,21,23). Yine bu araştırma ile benzer şekilde Mohsen ve arkadaşları ile Teotonio ve arkadaşları tarafından yapılan çalışmalarda yaşı büyük olan katılımcıların daha yüksek COVID-19-QoL puanına sahip olduğu görülmüştür (21, 23). Evli, yaşı büyük olan ve bir yakını COVID geçiren kişilerin yaşam kalitesinin daha kötü olmasının, COVID-19 döneminde sağlık çalışanlarının kendilerinden ziyade çevresindeki bireyleri daha fazla düşünmesinden kaynaklandığı düşünülmektedir.

Araştırmada katılımcıların algılanan streslerinin cinsiyet, medeni durum, yaş, COVID-19 geçirme durumu ve COVID-19 sebebiyle bir yakını kaybetme durumuna göre anlamlı bir fark göstermediği tespit edilmiştir. Buna ek olarak vardiyalı çalışanların ve doktorların algılanan streslerinin diğer gruplara göre anlamlı düzeyde daha yüksek olduğu görülmüştür. Stresle ilgili çalışmalar incelendiğinde cinsiyete göre, yaşa göre ve medeni duruma göre katılımcıların stres düzeylerinde istatistiksel açıdan fark bulunmayan bu

çalışmanın sonuçlarını destekleyen araştırmalar bulunmaktadır (17, 24-29). Yapılan başka bir çalışmada ise bu çalışmanın aksine katılımcıların çalışma şekline göre algılanan stres düzeylerinde anlamlı fark olmadığı tespit edilmiştir (29). Bunun, bu araştırmadaki örneklem grubunu acil servis çalışanlarının oluşturmasından kaynaklandığı düşünülmektedir. Bunun yanı sıra Taşdelen ve arkadaşları ile Ortega-Galan ve arkadaşları tarafından yapılan araştırmalarda bu çalışma ile benzer şekilde doktorların diğer sağlık çalışanlarına göre daha yüksek algılanan strese sahip oldukları görülmüştür (28, 29). Bu durumun doktorların hastaların tedavisinde doğrudan yer almalarından ve onlarla daha fazla temasta bulunmasından kaynaklandığı düşünülmektedir.

Araştırmanın temel amacı doğrultusunda yapılan doğrusal regresyon analizi sonucunda COVID-19'un yaşam kalitesi üzerindeki olumsuz etkisinin artmasının acil sağlık çalışanlarının algılanan stres düzeylerini de anlamlı düzeyde artırdığı tespit edilmiştir. Literatürde farklı ölçüm araçları kullanılarak yaşam kalitesinin stres üzerindeki etkisini veya ikisi arasındaki ilişkiyi hasta ve sağlık çalışanları üzerinde inceleyen çalışmalar bulunmaktadır. Hastalar üzerinde yapılan çalışmalarda iki değişken arasında bu çalışma ile benzer doğrultuda korelasyonun olduğu ortaya konulmuştur (8,17,24,27). Sağlık çalışanları üzerinde yapılan hem etkiyi araştıran çalışmalarda hem de korelasyonu araştıran çalışmalarda bu çalışmaya benzer şekilde ilişkilerin ortaya konulduğu tespit edilmiştir (11, 18, 29, 30). Görüldüğü üzere COVID-19 pandemisi döneminde yaşam kalitesi ve stres ile ilgili hasta ve sağlık profesyonelleri üzerinde birçok çalışma yapılmıştır. Bu çalışmalarda çalışılan gruplar farklı olsa da benzer sonuçlara ulaşılmıştır. Ancak bu araştırmalarda yer alan çalışma gruplarında COVID-19 vaka ve şüphelilerini ilk karşılayan grup olan acil servis sağlık çalışanlarının üzerinde yapılan bir araştırma olmadığı dikkat çekmiştir. Bu bağlamda bu araştırmanın diğer araştırmalara kıyasla ayrı bir öneme sahip olduğu düşünülmektedir.

Kısıtlılıklar

Araştırmanın tek bir hastane bünyesinde yürütülmüş olması bu çalışmanın sınırlılığını oluşturmaktadır. Ayrıca çalışma sonuçları, araştırmada kullanılan ölçeklerin ölçme kapasitesiyle sınırlıdır.

Sonuç

Tüm dünyayı ciddi boyutta etkisi altına alan COVID-19 pandemisinin acil sağlık çalışanlarının yaşam kalitesi üzerindeki etkisinin algılanan stres üzerindeki etkisini inceleyen bu araştırmanın, üzerinde çalışılan grubun pandemide büyük bir role sahip olması bakımından literatürde önemli bir boşluğu dolduracağı düşünülmektedir.

Araştırmadan elde edilen önemli sonuçlar incelendiğinde evli olan, ortalama üstü yaşa sahip olan ve COVID-19 sebebiyle bir yakını kaybetmiş olan bireylerin yaşam kalitelerinin COVID-19 pandemisinden olumsuz anlamda daha fazla etkilendiği görülmüştür. Buna ek olarak vardiya usulüne göre çalışanların ASÖ ve algılanan stres puan ortalamalarının sadece gündüz veya sadece gece gibi sabit mesai ile çalışanlarınkine göre anlamlı düzeyde daha yüksek olduğu görülmüştür. Ayrıca acil serviste çalışan bireylerin meslek gruplarına göre ASÖ puan ortalamalarında anlamlı fark olduğu ve doktorların diğer meslek gruplarına göre anlamlı düzeyde daha fazla stresli hissettikleri ortaya konulmuştur.

Tüm bu önemli sonuçların yanı sıra araştırmamızın temel amacı doğrultusunda elde edilen bulgular incelendiğinde araştırmamızda sonuç olarak acil sağlık çalışanlarında COVID-19 pandemisinin yaşam kalitesi üzerindeki olumsuz etkisinin algılanan stresi anlamlı şekilde etkilediği ve artırdığı tespit edilmiştir.

Araştırmamızın sonuçları dikkate alındığında acil serviste vardiya usulüne göre çalışanların vardiya nöbet saatlerini azaltacak şekilde düzenleme yapılması, nöbet sonrası izin verilmesi ve ayrıca acil serviste çalışan doktor sayılarının artırılarak iş yüklerinin azaltılması ve çalışma koşullarının iyileştirilmesinin sağlanması doktorların ve sağlık profesyonellerinin stres ile baş etme yeteneklerini güçlendirecektir. Ayrıca sağlık sistemlerinin en önemli aktörleri olan sağlık çalışanlarını etkin bir şekilde desteklemek için onların zorluklarının ve ihtiyaçlarının farkında olunmalıdır. Özellikle pandemi gibi sağlık işletmelerindeki hasta yükü ve hastalık riskinin arttığı olağanüstü durumlarda çalışanların motivasyonları artırılarak onların yaşam kalitesi ve stres düzeyleri azaltılmalıdır. Motivasyon için çalışma ortamlarında alınacak önlemler, ücret artışları, çalışma alanlarının iyileştirilmesi, işyerindeki sosyal ortamların geliştirilmesi gibi uygulamalar yapılabilecektir. Aksi halde bireylerin yaşam kalitesindeki ve stres düzeylerindeki olumsuz gelişmeler işten ayrılma, bireysel iş performansının azalması ve hizmet kalitesinin düşmesi gibi durumlara neden olma potansiyeline sahiptir. Bu bağlamda gelecekteki çalışmalarda bu durumu ortaya koyabilmek açısından stres ve iş yaşam kalitesinin işten ayrılma niyeti ve bireysel iş performansı üzerindeki etkileri araştırılabilir.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Bu çalışma herhangi bir finansal destek almamıştır.

Yazar Katkısı: Yazarlar yazının hazırlanmasında eşit olarak katkı sunmuşlardır.

Etik Kurul Onayı: Çalışmamız Selçuk Üniversitesi Sağlık Bilimleri Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu tarafından onaylanmıştır (Tarih: 18.08.2021, Sayı no: 2021/986). Çalışma Helsinki Deklarasyonu prensiplerine uygun olarak gerçekleştirilmiştir.

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Determination of Emergency Physicians' Level of Knowledge about Shoulder Dislocation and Reduction

Acil Servis Hekimlerinin Omuz Dislokasyonu ve Redüksiyonu Hakkındaki Bilgi Düzeylerinin Belirlenmesi

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ABSTRACT

Aim: Since the shoulder joint is the most active, mobile, and dislocated joint in the body, shoulder dislocations are one of the common admitting diagnoses in emergency departments. Our study aimed to determine the level of knowledge of emergency physicians about recognizing shoulder dislocation, shoulder reduction, the technique of choice, and the treatment process of shoulder dislocation.

Material and Methods: This is a questionnaire-based study in which it was aimed to enroll emergency residents, specialists, and academicians working in emergency departments between September 2021 and December 2021. The participants were surveyed with a multiple-choice questionnaire to determine their demographic characteristics and educational state as well as to rate their theoretical and practical knowledge of shoulder dislocation and reduction. The statistical analyses were performed using IBM SPSS for Windows 16.0 software package, and $p < 0.05$ was accepted as statistically significant.

Results: A total of 205 physicians participated in our study. The participants consisted of 133 residents, 66 specialists, and 6 academicians. According to the answers to the questionnaire, it was found that a majority of the participants had training on shoulder dislocation and reduction. It was found that those who received training, who had worked in emergency department for a longer time, and additionally, as compared with the residents, the specialists and academicians were more successful with and had a greater knowledge of shoulder dislocation and reduction.

Conclusion: It was found that, as compared with the specialists and academicians, the residents working in emergency department had an insufficient level of theoretical knowledge of shoulder dislocation and reduction. This fact about emergency department residents, who are likely to encounter shoulder dislocation, should be taken into consideration in their future training processes, and theoretical and practical trainings and courses should be planned.

Keywords: Shoulder dislocation, reduction, emergency department, level of knowledge

ÖZ

Amaç: Omuz eklemi vücudun en aktif, hareketli ve en fazla çiklıkla karşılaşılan eklemi olması nedeniyle omuz dislokasyonları, acil servislere sık başvuru tanılarında biridir. Çalışmamızda; acil servis hekimlerinin omuz dislokasyonunu tanıma, omuz redüksiyonu, hangi tekniği tercih ettikleri ve omuz dislokasyonunun tedavi süreci hakkındaki bilgi düzeylerinin belirlenmesi amaçlanmıştır.

Gereç ve Yöntemler: Çalışmamız Eylül 2021-Aralık 2021 tarihleri arasında acil servislere çalışan asistan hekim, uzman hekim ve eğitim görevlilerinin katılması amaçlanan bir anket çalışmasıdır. Demografik özellikler, eğitim durumlarını sorgulayıcı ve omuz dislokasyonu ve redüksiyonu ile ilgili teorik ve pratik bilgilerini ölçen çoktan seçmeli anket yöneltilmiştir. İstatistiksel analizler IBM SPSS for Windows 16.0 programı ile gerçekleştirilmiştir ve istatistiksel anlamlılık için $p < 0,05$ düzeyi kullanılmıştır.

Bulgular: Çalışmamıza toplam 205 hekim katıldı. Katılımcı dağılımı 133 asistan hekim, 66 uzman hekim ve 6 eğitim görevlisi şeklindedir. Verilen yanıtlara göre katılımcıların çoğunluğunun omuz dislokasyonu ve redüksiyonu ile ilgili eğitim aldıkları görülmüştür. Eğitim alanların, acil serviste çalışma süresi daha uzun olanların ayrıca uzman hekim ve eğitim görevlilerinin asistan hekimlere göre omuz dislokasyonu ve redüksiyonu konusunda daha başarılı ve bilgili oldukları görüldü.

Sonuç: Acil serviste çalışan asistan hekimlerin; uzman hekim ve eğitim görevlilerine kıyasla omuz dislokasyonu ve redüksiyonu hakkında teorik bilgi düzeylerinin yeterli düzeyde olmadığı tespit edildi. Omuz dislokasyonu ile karşılaşmaları muhtemel acil servis asistan hekimlerinin bu durumu, gelecek eğitim süreçlerinde göz önünde bulundurulmalı; teorik ve pratik eğitimler, kurslar planlanmalıdır.

Anahtar kelimeler: Omuz dislokasyonu, redüksiyon, acil servis, bilgi düzeyi

Received: May 27, 2023

Accepted: June 11, 2023

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Atif için/Cited as: Büyük F, Kahraman FA, Camci M, Tanrıverdi F, Yıldırım C, Günaydın GP, Ergin M. Determination of Emergency Physicians' Level of Knowledge about Shoulder Dislocation and Reduction. Anatolian J Emerg Med 2023;6(3):128-133. <https://doi.org/10.54996/anatolianjem.1301864>

Introduction

The most common form of joint dislocation in the human body is the glenohumeral joint dislocation, which is the most important cause of shoulder instability (1). The incidence of shoulder trauma is high because it is the most mobile, active, and dislocated joint and involved in the self-defense reflex of the body. The shoulder joint's stability is dependent on dynamic and static soft tissue structures such as the glenohumeral ligaments, labrum and rotator cuff (2). Shoulder dislocations constitute approximately 45% of all joint dislocations and 85% of shoulder dislocations are the anterior glenohumeral dislocations (3). When it comes to prognosis, the main factor affecting treatment success is the development of a recurrent dislocation after reduction. Considering that it affects a patient's quality of life, its negative effects on sport activities and its painful nature, glenohumeral joint dislocation is a condition that requires a definitive and urgent treatment (4).

Shoulder dislocation is one of the common causes of emergency department admissions and emergency physicians are usually the first to encounter and manage the condition (5). It is also known that a consultation for reduction is mostly requested in emergency departments. However, there is a very limited body of scientific evidence about optimal shoulder dislocation reduction techniques and the use of medications during them. More than 50 shoulder dislocation reduction techniques have been described. This complicates the determination of 'the best' technique or approach for each dislocation encountered (4,6,7).

Therefore, we designed a questionnaire study to determine the level of knowledge of academicians, specialists and residents working in emergency department of shoulder dislocation and reduction, how they recognize shoulder dislocation and which methods they prefer and their level of knowledge in the treatment process. Our aim was to determine the level of knowledge of emergency department physicians of shoulder reduction, so as to reveal the necessity of training and work plans for this condition to prevent unnecessary consultations and to speed up the workflow of the emergency department.

Material and Methods

After its approval by Ankara City Hospital No 1 Clinical Research Ethics Committee Directorate on 23/06/2021 with the approval number E1-21-1892, this study was applied to residents, specialists, and academicians working in emergency departments. The questions to determine the demographic characteristics, educational level and the level of knowledge of the participants were designed as a questionnaire form using Google Questionnaires based on Baden et al.'s survey on Dutch emergency medicine physicians and Chong et al.'s survey among trauma clinicians in the UK (6,8), which was then delivered in digital medium. The inclusion criteria were determined as working an emergency resident or specialist; the exclusion criteria included the failure to answer all of the questions, failure to include an e-mail address on the questionnaire form, and giving multiple answers in a single answer field.

Statistical analysis

Statistical analyses were performed using IBM SPSS for Windows 16.0 software package. First of all, categorical demographic data were presented as the number of cases and percentage and continuous numerical demographic data as mean, standard deviation, median, minimum, maximum, and 25-75% quartiles. The frequency distribution of ordinal variables were analyzed using Pearson Chi-Square and Fisher's Exact tests. The distribution analysis of continuous variables were performed with Shapiro-Wilk test. Mann Whitney-U test was used for the comparison of the median values of non-normally distributed variables between two groups and Kruskal-Wallis test for the comparison of the median values between more than two groups. The data were expressed as median, IQR, minimum, and maximum values. Statistical significance was set at $p < 0.05$.

Results

Of a total of 205 physicians who participated in our study, 63.4% were male ($n=130$) and 35.6% were female ($n=75$); 64.9% were residents ($n=133$), 32.2% were specialists ($n=66$), and 2.9% were academicians ($n=6$). The mean age of the participants was 32 years with a standard deviation of 6 years; with the youngest participant being 24 years old and the oldest one 56 years old. The median age was found to be 30 years with an interquartile range of 28-34 years. An analysis of the age groups and emergency department experience of the participants showed that the number of participants aged 30 years or above ($n=114$, 55.6%) and those with an emergency department experience of 1-5 years ($n=93$, 45.4%) was higher than those of other participants.

The question whether the participants previously received training on shoulder dislocation and reduction was answered as "yes" by 136 participants; the question whether the participants performed shoulder reduction in the last 1 year was answered as "yes" by 193 participants; the question about the success of shoulder reduction that the participants attempted in the last 1 year was answered as "successful" by 43 participants, "mostly successful" by 95 participants, "mostly unsuccessful" by 36 participants, and "unsuccessful" by 19 participants; and the question about the frequency of consultation requests from the department of orthopedics for shoulder dislocations the participants encounter was answered as "always" by 55 participants, "mostly" by 55 participants, "rarely" by 81 participants, and "never" by 13 participants. (Table 1).

When the distribution of the participants who performed reduction in the last 1 year was analyzed by academic title, it was found that all of the academicians and emergency specialists performed reductions whereas 9% of the residents never performed it ($p=0.021$). The analysis of the distribution of reduction success by academic title revealed that the most successful group was the academicians; with 66.7% of the academicians being mostly successful and 33.3% being successful. Of the specialists, 65.2% answered that they are mostly successful, 30.3% successful, and 4.5%

		n (%)
Have you ever had any training on shoulder dislocation and reduction?	No	69 (33.7)
	Yes	136 (66.3)
Have you had a shoulder reduction in the last 1 year?	No	12 (5.9)
	Yes	193 (94.1)
How would you describe the success of shoulder reductions for dilocations you encountered and attempted to reduce in the last 1 year?	Unsuccessful	19 (9.8)
	Mostly unsuccessful	36 (18.7)
	Mostly successful	95 (49.2)
	Successful	43 (22.3)
How would you describe your state of requesting orthopedics consultation for shoulder dislocations you encountered in the last 1 year?	Never	13 (6.4)
	Rarely	81 (39.7)
	Mostly	55 (27)
	Always	55 (27)

Table 1. The participants' training state for shoulder dislocation, The participants' training state for shoulder dislocation, whether they performed reduction in the last 1 year, reduction success, and state of consultation of shoulder dislocation with the department of orthopedics

mostly unsuccessful. The residents were the least successful group, with 17.4% answering that they are successful, 39.7% whether they performed reduction in the last 1 year, reduction success, and state of consultation of shoulder dislocation with the department of orthopedics mostly successful, 27.3% mostly unsuccessful, and 15.7% unsuccessful ($p < 0.001$). Although the analysis of the consultation requests from the department of orthopedics by academic title showed that the academicians requested less consultation than the specialists and residents, 27% of all participants answered that they always requested consultation; 27% of them mostly requested consultation; 39.7% rarely requested consultation; and 6.4% never requested consultation.

The question asking the participants which reduction technique they primarily preferred for reduction of anterior shoulder dislocation was answered as the traction counter-traction technique by 81 participants (39.5%), and this technique was the most preferred one. The second most commonly preferred technique was external rotation stated by 61 (29.8%) participants, which was followed by the Cunningham technique stated by 55 (26.8%) participants (Table 2).

One hundred and fifty-nine (77.6%) participants used procedural sedation before shoulder reduction while 46 (22.4%) stated that they did not use procedural sedation. Two hundred and four participants (99.5%) preferred physical examination and plain radiogram in the diagnostic process while 1 participant (4.5%) stated that he/she preferred computerized tomography. No participant used ultrasonography in the diagnostic process. An analysis of the rates of requesting a control x-ray after shoulder reduction

		n	%
1(Traction Counter-traction)	No	124	60.5%
	Yes	81	39.5%
2(Scapular Manipulation)	No	169	82.4%
	Yes	36	17.6%
3(Kocher)	No	183	89.3%
	Yes	22	10.7%
4(External Rotation)	No	144	70.2%
	Yes	61	29.8%
5(Stimson)	No	192	93.7%
	Yes	13	6.3%
6(FARES)	No	203	99.0%
	Yes	2	1.0%
7(Milch)	No	202	98.5%
	Yes	3	1.5%
8(Spasso)	No	204	99.5%
	Yes	1	0,5%
9(BOB (Best-of-Bob))	No	204	99,5%
	Yes	1	0,5%
10(Cunningham)	No	150	73,2%
	Yes	55	26,8%
11(Other...)	No	185	90,2%
	Yes	20	9.8%

Table 2. Distribution of which reduction technique or techniques the participants primarily preferred for anterior shoulder dislocation

by academic title showed that all of the academicians and specialists requested a control x-ray; while 2 (1.5%) of the residents did not request it while the rest of them ($n=131$, 98.5%) requested a control x-ray. All participants preferred the velpau bandage prepared in the emergency department for immobilization after reduction; in addition, there was no participant who did not recommend shoulder immobilization. Comparison of the participants' previous training on shoulder dislocation and reduction with the success rates of shoulder dislocations they encountered and attempted to reduce in the last 1 year showed that the failure rates of those who did not have any training were higher ($p < 0.001$) (Table 3).

Comparison of the participants' previous training on shoulder dislocation and reduction with their rate of requesting consultation from the department of orthopedics for shoulder dislocations they encountered in the last 1 year showed that those who had no training had a higher rate of requesting consultation from the department of orthopedics ($p < 0.001$) (Table 4).

			Unsuccessful	Successful	Total
Have you ever had any training on shoulder dislocation and reduction?	No	n(%)	31(52.5)	28(47.5)	59(100)
	Yes	n (%)	24(17.9)	110(82.1)	134(100)

Pearson Chi-Square test; $p < 0.001$

Table 3. Comparison of the participants' previous training on shoulder dislocation and reduction with the success rates of shoulder dislocations they encountered and attempted to reduce in the last 1 year

			How would you describe your state of requesting a consultation from the department of orthopedics for shoulder dislocations you encountered in the last 1 year?				Total
			Never	Rarely	Mostly	Always	
Have you ever had any training on shoulder dislocation and reduction?	No	n(%)	2(2,9)	9(13,2)	21(30,9)	36(52,9)	68(100)
	Yes	n(%)	11(8,1)	72(52,9)	34(25)	19(14)	136(100)

Pearson Chi-Square test; $p < 0.001$

Table 4. Comparison of the participants' previous training on shoulder dislocation and reduction with their rate of requesting consultation from the department of orthopedics for shoulder dislocations they encountered in the last 1 year

Comparison of the participants' previous training on shoulder dislocation and reduction with their rate of using procedural sedation before shoulder reduction showed that those who had no training used a lesser rate of procedural sedation ($p = 0.213$) (Table 5).

Discussion

Since the specialty of emergency medicine in our country is a relatively young branch and thus emergency medicine specialists are young and since a greater number of residents participated in our study, the median age of the study participants was 32 years, with the oldest participant being 56 years old. Considering that 64.9% of the study participants were residents and the rest were specialists and academicians, the average working duration was calculated as 5 years.

The participants were asked if they have previously had any training on shoulder dislocation and reduction and 66.3% of them answered this question as "yes". When the trained participants were asked from which source they received training, those who received in-clinic training ranked first with 52 participants (25.4%). The percentage of those who received training by attending a trauma course or by their own efforts was lower. It is thought that this is due to the fact that the participant group consists of residents,

specialists and academicians and that these groups received such training during their residency program.

When the distribution of the shoulder reduction success of the participants in the last 1 year and the rate of requesting consultation from the department of orthopedics were analyzed by academic title, it was found that the academicians were the most successful group and had the lowest consultation request rate (66.7%). When the shoulder reduction success of the participants in the last 1 year and the rate of requesting for orthopedic consultation were analyzed by emergency department experience, we found that those with more than 10 years of emergency department experience were more successful and requested less consultation than the other groups. This indicates that increased clinical experience and training increases the success rate. It can be hypothesized that physicians with less clinical experience seek consultation due to the fear of failure in reduction or causing complications. In a questionnaire study that was conducted by Baden et al. among emergency department staff, the question asking the most commonly preferred method for the reduction of Anterior Shoulder Dislocation was answered as the Traction Counter-traction technique (6). A study by T.D. Berends et al. reported that the most commonly preferred techniques for anterior shoulder dislocation were the Hippocrates

			Do you use procedural sedation before reducing shoulder dislocations?		
			No	Yes	Total
Have you ever had any training on shoulder dislocation and reduction?	No	n(%)	19(27,5)	50(72,5)	69(100)
	Yes	n(%)	27(19,9)	109(80,1)	136(100)

Pearson Chi-Square test; p=0.213

Table 5. Comparison of the participants' previous training on shoulder dislocation and reduction with their rate of using procedural sedation before shoulder reduction

technique (17%), Kocher technique (14%), Stimson technique (12%), and Milch technique (5%) (9). In line with the literature data, our study also found that the most commonly preferred technique was the Traction Counter-traction technique which was preferred by 81 (39.5%) participants. Although the guidelines do not mention any superiority of the available techniques to one another, it is recommended that each practitioner use the method that is most suitable for him/her and that he/she is most familiar with. In a study by Ron L. te Slaa et al., it was reported that 83% of orthopedic surgeons in the Netherlands performed procedural sedation before shoulder reduction. Systemic sedation was performed most commonly as the procedural sedation and intraarticular analgesia to a lesser extent.(10) Hayashi et al. reported that 6 of 19 patients with failed shoulder reduction attempt in the emergency department received no intravenous analgesics; 10 received no intraarticular lidocaine; 4 received no peripheral nerve block; 4 received no sedatives; and 2 received no medication (4). While 159 (77.6%) of our participants administered procedural sedation before shoulder reduction, 46 (22.4%) of them stated that they did not use procedural sedation before shoulder reduction. One can think that reduction without sedation is performed less due to overcrowding and time constraints in the emergency department.

According to Michael Gottlieb et al., although radiograms are still routinely used for making the diagnosis of shoulder dislocation in the emergency department, bedside focused ultrasonography (FOCUS) has been introduced into clinical practice and become useful due to various reasons such as radiation exposure, difficulties in noticing some posterior dislocations, difficult and delayed patient transport to the x-ray room, and the need for repeat imaging (11). Almost all participants stated that they preferred physical examination and x-ray for making diagnosis, with no participant having opted for USG as a diagnostic tool. We believe that as the use of USG becomes common and emergency department overcrowding is overcome, evaluation with USG will become more common.

In a study by Michael Shuster et al., the rate of requesting a control x-ray was remarkably high among physicians (12). In a study by T. D. Berendes et al., the rate of requesting an x-ray before and after reduction were also considerably high (9). Roberts and Hedges explained this finding by relating it to the traditional teaching-based education in the specialties of orthopedics and emergency medicine (13). Among the

physicians that participated in our study, the rate of requesting a control x-ray after shoulder reduction is 99%. It can be argued that traditional education-based education and malpractice concerns have a large share in such a high rate in our country. In a study by Ron L. te Slaa et al. orthopedists recommend immobilization after reduction (10). As for the duration of immobilization, Kiviluoto et al. showed that the rate of recurrent dislocation was higher in patients younger than 30 years than older patients, and that it was higher in patients younger than 30 years than those with an immobilization duration of 1 week (14). In our study, on the other hand, 160 participants (78%) stated that they recommend velpau bandage for immobilization after performing reduction in the emergency department while 45 participants (22%) stated that they recommend the purchase of readymade shoulder fixation velpau bandage. There was no participant who does not recommend immobilization. Literature data indicate that 3-week immobilization prevents recurrence.

Limitations

The limitations of our study include the failure to enroll equal and adequate number of participants in the groups, with the numbers of the academicians and specialists being less than that of residents, which reduced the power of some statistical data. No solution was found to prevent individuals from filling the questionnaire multiple times using different e-mails or fake accounts, but it was thought that the participating physicians would not attempt such fabrication because of their sociocultural level. In our study, only theoretical knowledge could be measured and a comparison was made accordingly. No measurement was made of how much theoretical knowledge is applied in practice. These points should be taken into consideration in future studies.

Conclusion

Glenohumeral joint dislocation is the most frequent joint dislocation in the body and the most common cause of shoulder instability.

Our study revealed that most physicians receive particularly in-clinic training on shoulder dislocation and reduction, and the reduction success of the emergency physicians who received training is higher than those who did not; furthermore, the reduction success rates of the academicians and specialists are higher than that of the residents. Emergency physicians with less clinical experience

consult the department of orthopedics for most shoulder dislocations they encounter.

Traction Counter-traction (Hippocrates) method is used more frequently among the available reduction techniques; sedation is mostly performed before reduction; physical examination and x-ray are the most frequently used tools for putting the diagnosis; most participants request control x-rays after reduction; all participants recommend immobilization after reduction; and Velpau bandage is applied for immobilization in the emergency room instead of using a readymade bandage.

When our study results and literature data were evaluated together, it was evident that emergency physicians need further and qualified training on shoulder dislocation and reduction, and their level of knowledge and skills in this condition should be increased.

Conflict of Interest: The authors declare no conflict of interest regarding this study.

Financial Disclosure: This research received no specific grant from any funding agency in the public, commercial, or notfor-profit sectors.

Authors' Contributions: FB, FAK, FT and ÇY contributed to data acquisition and data analysis; FB, FAK, MÇ and GPG contributed to manuscript preparation, manuscript editing, and manuscript review; FB, FAK, MÇ and ME contributed to data acquisition and literature search.

Ethical Approval: Institutional review board approval was obtained from Ankara City Hospital No 1 Clinical Research Ethics Committee Directorate on 23/06/2021 with the approval number E1-21-1892.

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Addison's Crisis or Momordica Charantia Extract: Which Caused Shock?

Şokun Sebebi Addison Krizi mi Yoksa Kudret Narı (Momordica charantia) mı?

Nezihat Rana Dişel¹, Ömer Taşkın², Mehtap Evran³, Ufuk Akday⁴, Ayça Açıklın Akpınar¹

ABSTRACT

Aim: Addison's crisis is extremely rare entity that is difficult to diagnose in the emergency department. Here we present a case of Addison's crisis diagnosed in the emergency department who complained of vomiting after consuming extract of Momordica charantia fruit for gastric pain.

Case: A 29-year-old female was admitted to the emergency department with complaints of nausea and vomiting after consuming Momordica charantia extract for stomach pain. The patient had tachypnea, tachycardia, hypoglycemia, and hypotension. Blood tests revealed elevated anion gap (24 mEq/L) metabolic acidosis, +4 acetone, normokalemia, and hyponatremia. Although it was impossible to exclude intoxication immediately, 100 mg hydrocortisone was given IV due to possible Addison's crisis after obtaining blood samples for hormone testing and excluding other causes of shock. The tests revealed very high ACTH (1.250 pg/mL) and low cortisol (1.23 ug/dL) levels, and the patient was diagnosed with primary adrenal insufficiency.

Conclusion: This case illustrates the importance of comprehensive examination and management of profound hypotension and hypoglycemia in the emergency department and of emergency physicians diagnosing and initiating appropriate treatment for Addison's crisis.

Keywords: Addison's crisis, momordica charantia, bitter melon, shock, metabolic acidosis

ÖZ

Amaç: Addison krizi acil serviste tanı konulması zor olan oldukça nadir rastlanan bir durumdur. Bu yazımızda acil servise mide ağrısı için kudret narı meyvesi (Momordica charantia) ekstresi yedikten sonra kusma şikâyeti ile başvurup, addison krizi tanısı konulan olguyu sunmayı hedefledik.

Olgu: 29 yaşında kadın hasta mide ağrısı için kudret narı (Momordica charantia) meyvesi ekstresini yedikten sonra bulantı ve kusma şikayetiyle acil servise başvurdu. Hastanın başvuru anında takipne, taşikardi, hipoglisemi ve hipotansiyonu mevcuttu. Kan sonuçlarında anyon açıklığı artmış (24 mEq/L) metabolik asidoz, +4 aseton, normokalemi ve hiponatremi görüldü. Zehirlenmeyi hemen dışlamak mümkün olmadığı için olası Addison krizi nedeniyle hormon testi için kan örneği alındıktan sonra ve diğer şok nedenleri dışlanarak IV 100 mg hidrokortizon verildi. Daha sonra hastanın kan sonuçlarında çok yüksek ACTH düzeyi (1.250 pg/mL) ve düşük kortizol (1.23 ug/dL) düzeyi tespit edildi ve hastaya primer adrenal yetmezlik tanısı konuldu.

Sonuç: Bu vaka, acil serviste derin hipotansiyon ve hipogliseminin kapsamlı muayenesinin ve yönetiminin, Addison krizini teşhis eden ve uygun tedaviyi başlatan acil hekimlerinin önemini göstermektedir.

Anahtar Kelimeler: Addison krizi, momordica charantia, kudret narı, şok, metabolik asidoz

Received: October 31, 2022

Accepted: May 3, 2023

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Atıf için/Cited as: Dişel NR, Taskin O, Evran M, Akday U, Akpınar AA. Addison's Crisis or Momordica Charantia Extract: Which Caused Shock? Anatolian J Emerg Med 2023;6(3):134-136. <https://doi.org/10.54996/anatolianiem.1197292>

Introduction

Primary adrenal failure is an extremely rare entity that is difficult to diagnose in the emergency department (ED), with an incidence of 50 cases per 1.000.000 in the USA and 5 to 200 cases per 1.000.000 in Europe (1, 2). In this case report, we discuss a patient who complained of vomiting after consuming extract of *Momordica charantia* fruit for gastric pain. The patient was pre-diagnosed with Addison's crisis, and the diagnosis was confirmed as primary adrenal insufficiency and successfully managed in the ED.

Case Presentation

A 29-year-old Caucasian female was admitted to the ED with complaints of nausea and vomiting. The patient reported consuming *Momordica charantia* fruit extract to relieve stomach pain and nausea, which had persisted for two weeks. The patient was hyperpneic, tachypneic (24 respirations per minute), and tachycardic (126 beats per minute), exhibited deep hypoglycemia (40 mg/dL) and hypotension (blood pressure undetectable) with a Glasgow Coma Scale score of 15, and had no fever or hypoxemia. The patient had a BMI of 16.9 and dark skin. The Rapid Ultrasound for Shock and Hypotension (RUSH) protocol was performed. Pericardial tamponade, pneumothorax, cardiac wall motion abnormalities, pulmonary embolism, and right ventricular failure were all excluded as possible causes of hypotension. The patient had no free fluid in the abdomen; however, the patient had a narrow, collapsed inferior caval vein, indicating dehydration, for which the patient was immediately given 50 gr dextrose and 2 liters saline IV infusions, which minimally restored blood glucose, blood pressure, and urinary output. The patient's blood tests revealed elevated anion gap (AG=24 mEq/L) metabolic acidosis with a normal lactate level and +4 acetone, normokalemia, and hyponatremia, all of which indicated starvation ketosis (Table 1).

Metabolic acidosis persisted despite fluid replacement. The patient denied taking any drugs or chemicals that may cause elevated anion gap metabolic acidosis and was negative for paracetamol or salicylate, which might have caused the metabolic acidosis. There were no signs of infection causing septic shock. We started sodium bicarbonate IV. The persistence of metabolic acidosis, hypotension, hypoglycemia, and hyponatremia (except normokalemia) suggested Addison's crisis. The patient was given IV 100 mg of hydrocortisone after blood samples were obtained to measure ACTH and cortisol levels. A hemodialysis catheter was inserted to start hemofiltration in case of poisoning, and the patient was transferred to the intensive care unit. Blood biochemistry revealed very high ACTH (1.250 pg/mL) and low cortisol (1.23 ug/dL) levels, and the patient was diagnosed with primary adrenal insufficiency. The metabolic acidosis was meliorated, and the patient was transferred to the

Parameters	Levels
pH	7.25
PCO ₂ (mmHg)	15.4
HCO ₃ (mmol/L)	6.5
Na (mmol/L)	125
K (mmol/L)	4.02
Mg (mg/dL)	0.96
Cl (mmol/L)	102
Lactate (mmol/L)	1.47
BUN (mg/dL)	12.33
Creatinine (mg/dL)	0.69
ACTH (pg/mL)	>1250
Cortisole (µg/dL)	1.23

Table 1. Laboratory results

endocrinology ward. The patient was evaluated for etiologic and co-existing diseases and was discharged on the 12th day of admission with oral replacement therapy. Written consent was obtained from the patient.

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Discussion

Adrenal crisis (also known as Addison's crisis [AC]) refers to acute adrenal insufficiency, which is most common in patients with primary adrenal insufficiency (2). It may also occur in those with secondary or tertiary adrenal insufficiency or in patients who are abruptly withdrawn from exogenous glucocorticoids. AC predominantly manifests with shock, but the patients often have nonspecific symptoms, such as nausea, vomiting, abdominal pain, fever, weakness, fatigue, confusion or coma (3). This life-threatening emergency requires immediate treatment. In emergency settings, AC may be encountered as a potential complication of blunt trauma (including motor vehicle accidents); as a result of sudden, bilateral adrenal necrosis caused by hemorrhage, embolism, or sepsis; or, rarely, as a result of adrenal vein thrombosis after a back injury. Both mineralocorticoid and glucocorticoid deficiency can contribute to the development of AC, and there is almost always an acute stressor or cause of adrenal insufficiency (3). The clinical presentation includes hypotension, hypoglycemia, hyponatremia, and hyperkalemia. Except hyperkalemia, which was absent in our patient, the patient's physical appearance and clinical findings were diagnostic.

The vomiting may have altered the patient's potassium levels.

Bitter melon (*Momordica charantia* L.) is a plant that is consumed to support medical treatment. It includes bioactive chemicals, vitamins, minerals, and antioxidants. In most cultures, it is used as an herbal medicine to treat many conditions, and in Turkey, it is used for gastro-intestinal complaints. It may cause hypoglycemia due to an insulin-secretagogue-like effect, stimulation of skeletal muscle and peripheral cell glucose utilization, inhibition of intestinal glucose uptake, inhibition of adipocyte differentiation, suppression of key gluconeogenic enzymes, stimulation of key enzymes, HMP pathway, and preservation of pancreatic islet cells and their functions (4). Our patient reported using the extract for gastric pain. The hypoglycemic effect is a known result of this plant, but the patient's other symptoms are not known to be associated with it.

The emergency treatment includes immediate administration of 100 mg of parenteral hydrocortisone via an IV or intramuscular (IM) bolus injection. This bolus should be followed by hydrocortisone 200 mg/24h or 50 mg IV/IM every six hours (5). Our patient had received hydrocortisone concomitant to supportive care, and improvement of the patient's clinical state and laboratory parameters were achieved at the 48th hour of treatment.

Conclusion

This case illustrates the importance of the comprehensive examination and management of hypotension and hypoglycemia in the ED and of emergency physicians diagnosing and initiating appropriate treatment for Addison's crisis. If the patient presents with nausea and vomiting with a history of anorexia and weight loss, acute abdominal pain, hypoglycemia, dehydration and shock, unexplained fever, hyperpigmentation, or electrolyte imbalances such as hyponatremia, hyperkalemia, hypercalcemia, or azotemia, physicians should suspect Addison's crisis and start treatment.

Conflict of Interest: No conflict of interest was declared by the author.

Financial Disclosure: No financial disclosure was declared by the author.

Authors Contribution: All authors contributed equally to the preparation of the article.

Informed Consent Statement: Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review in this journal.

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Use of Language-Based Artificial Intelligence in Medicine

Tıpta Dil Tabanlı Yapay Zeka Kullanımı

Mehmet Mahir Kunt¹ 

ABSTRACT

ChatGPT, which stands for Chat Generative Pre-trained Transformer, is a language model-based artificial intelligence model developed by OpenAI. ChatGPT was first made available as a free research preview. Currently, the corporation has made the GPT-3.5 version publicly available for free. A enhanced version called GPT-4 is offered only to paid users under the trade name "ChatGPT Plus." It has been trained using a big set of text data and is continually being trained. It can communicate with humans and generate writing on a range of themes. These capabilities enable a variety of medical usage scenarios. In this paper, we discuss the usage of Chat GPT and other language-based artificial intelligence models in medicine.

Keywords: ChatGPT, medicine, artificial intelligence

ÖZ

Açılımı Chat Generative Pre-trained Transformer olan ChatGPT, OpenAI firması tarafından geliştirilen bir dil modeli tabanlı bir yapay zeka modelidir. ChatGPT ilk önce ücretsiz bir araştırma önizlemesi olarak yayınlanmıştır. Şu anda firma ücretsiz olarak GPT-3.5 tabanlı sürümü herkesin erişimine açmıştır. GPT-4 tabanlı gelişmiş sürüm "ChatGPT Plus" ticari adı altında sadece ücretli aboneler tarafından kullanılabilir. Geniş bir metin verisi kümesi kullanılarak eğitilmiştir ve hala eğitime devam edilmektedir. İnsanlarla akıcı bir şekilde iletişim kurabilmektedir ve çeşitli konularda metin üretebilme kabiliyetine sahiptir. Bu özellikleri, tıp alanında da çeşitli kullanım senaryolarını mümkün kılmaktadır. Bu yazıda Chat GPT ve benzeri dil tabanlı yapay zeka modellerinin tıpta kullanımı tartışılacaktır.

Anahtar Kelimeler: ChatGPT, tıp, yapay zeka

Gönderim: May 22, 2023

Kabul: June 21, 2023

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Atıf için/Cited as: Kunt MM. Tıpta Dil Tabanlı Yapay Zeka Kullanımı. Anatolian J Emerg Med 2023;6(3):137-140. <https://doi.org/10.54996/anatolianjem.1358128>

ChatGPT Nedir?

Açılımı Chat Generative Pre-trained Transformer olan ChatGPT, OpenAI firması tarafından geliştirilen ve 30 Kasım 2022'de piyasaya sürülen büyük bir dil modeli tabanlı bir yapay zeka modelidir. ChatGPT ilk önce ücretsiz bir araştırma ön izlemesi olarak yayınlanmıştır. Şu anda firma ücretsiz olarak GPT-3.5 tabanlı sürümü herkesin erişimine açmıştır. GPT-4 tabanlı gelişmiş sürüm "ChatGPT Plus" ticari adı altında sadece ücretli aboneler tarafından kullanılabilir(1). Geniş bir metin verisi kümesi kullanılarak eğitilmiştir ve hala eğitime devam edilmektedir. İnsanlarla akıcı bir şekilde iletişim kurabilmektedir ve çeşitli konularda metin üretebilme kabiliyetine sahiptir. Bu özellikleri, tıp alanında da çeşitli kullanım senaryolarını mümkün kılar (1,2).

Hastalar için İletişim Köprüsü Olarak ChatGPT

Hastalar, hastalıkları, tedavileri veya ilaçları hakkında birçok soru sorabilirler. ChatGPT, bu soruları yanıtlayarak hastaların daha iyi bilgilendirilmesine yardımcı olabilir. Ayers ve arkadaşlarının çalışmasında herkese açık bir forumda bir doktora sorulan sorulardan 195 adeti derlenmiş ve bu soruları yeni bir oturum açarak Chat GPT'ye sorulmuştur. Sonuçları başka uzman grupları değerlendirmişler ve verilen bilgi kalitesi ve empati durumu karşılaştırılmıştır. ChatGPT yanıtları doktor yanıtlarına göre bilgi kalitesi açısından anlamlı olarak iyi bulunmuştur. Ayrıca yine Chat GPT yanıtları doktor yanıtlarına göre empati açısından da anlamlı olarak yüksek bulunmuştur(3)

ChatGPT, hastaların doktor randevularını ayarlamalarına yardımcı olabilir. Ayrıca, randevu hatırlatmaları ve muayene sonuçları gibi bilgileri paylaşabilir. Birçok firma web sayfalarından tüketicilerini yönlendirme şikayet ve ürün ile ilgili bildirimlerini yapay zeka yardımı ile yapmaktadırlar. Çok kolay şekilde web sayfalarınıza ekleyebileceğiniz randevu kaydı veya hatırlatmalar kaydedebilen chatbotlar mevcuttur. İnternette deneme veya kısıtlı kullanımları olan bedava versiyonları mevcuttur (4).

ChatGPT, hastalıkların belirtileri, risk faktörleri ve sağlıklı yaşam tarzı hakkında eğitici materyal sunabilir. Bu, hastaların kendi sağlıkları hakkında daha bilinçli kararlar almalarına yardımcı olabilir. Ne zaman hangi sağlık kuruluşuna başvurmaları gerektiği konusunda bilgi alabilirler.

Kronik hastalığı olan hastalar, semptomlarını izlemek ve kaydetmek için ChatGPT'yi kullanabilirler. Kullandıkları ilaçlar ve yan etkileri hakkında yardımcı olabilir. Acil bir durumda hastalar, ChatGPT aracılığıyla hızlıca nasıl hareket etmeleri gerektiği konusunda bilgi alabilirler. Son yıllarda hastalıklar ve hastalık durumunun aciliyeti konusunda internette tarama yaparak bilgi almak yaygınlaşmıştır. Bu durum bazı yanlış bilgiler edinilmesine neden olabilmektedir. ChatGPT ve benzeri yapay zekalar hasta semptomlarını

sorarak daha doğru değerlendirme ve daha doğru bilgilere ulaşılmasını sağlayabilirler(3,5)

Teşhis Yardımcısı Olarak ChatGPT

ChatGPT, semptomları değerlendirerek uzmanlara teşhis önerileri sunabilir. Bu konuda çalışmalar mevcuttur(2). Yine de kesin teşhisler için her zaman doktor görüşü gereklidir. ChatGPT tıbbi notlar olarak tıbbi kayıtlar oluşturabilmektedir. Alınan hikayeye göre yeni sorular sorabilmektedir. Alınan notları klinisyene özetleyebilmektedir. ChatGPT tanı, konsültasyon ve eğitim için kullanılabilir. Hastanın ilk bulguları, laboratuvar sonuçları verildiğinde klinisyene tanı ve tedaviye yardımcı olacak bir sorgulama yapabilir. İnteraktif yapısı itibarıyla hikayeye göre kısa sorular ve kısa cevaplar isteyerek konuyu ayrıntılı hale getirebilir. Klinik araştırmalarda da benzer çalışmaları bulabilir, değerlendirebilir, teknik konularda analiz yapabilir, sonuçları değerlendirebilir ve araştırma sonuçlarına göre yeni araştırmalara yönlendirebilir(6).

ChatGPT acil servis içi triyaj yapabilmektedir ve özellikle kritik triyaj kategorisindeki hastaları daha başarılı şekilde seçebilmektedir(7-9). Yine acil serviste hastalar için taburculuk sonrası öneriler yazabilmektedir. Hastaya hastalığı ve yapılanları açıklayarak, reçete edilen ilaçlarının kullanımını tariflemekte, evde uyması gereken yasakları, hangi durumlarda tekrar acile gelmesi gerektiğini ve kontrol için hangi tarihte hangi bölüme gideceğini hastanın tıbbi bilgi düzeyine göre tarifleyebilmektedir(10).

ChatGPT'nin ilk kullanım alanlarından biri de radyolojidir. Radyolojik görüntüleri değerlendirebilmektedir. Radyologlara ayırıcı tanıya yardımcı olabilmektedir. Taslaklara uygun tıbbi görüntüleme raporları yazabilmektedir. Ayrıca raporları hastalar için anlayabilecekleri şekilde basitleştirebilmektedir(11,12). Çalışma akışını hızlandırmakta ve iyileştirmekte gelecek vadetmektedir.

ChatGPT cerrahi öncesi değerlendirme, anestezi riskleri, anestetik ilaç seçimi vb. konularda asistanlık yapabilir. Ayrıca doktor randevularını ayarlayabilir, tıbbi kayıtlardaki hataları azaltabilir. Hastaneye yatış ve preoperatif hazırlık ile ilgili işlemleri kolaylaştırabilir. Hastalara bilgi verebilir. Cerrahlara preoperatif değerlendirme, ameliyat teknikleri, kolası komplikasyonlar ve postoperatif bakım ihtiyaçları konusunda yardımcı olabilir(13).

ChatGPT hemşirelik bakımında da yardımcı olabilecektir. Yazılar ve kayıtların tutulmasında yardımcı olabilir. İlaç etkileşimleri, uygulama yolları ve yan etkileri konusunda uyarabilir. Hastaya özel bakım planı hazırlamada yardımcı olabilir. Hasta ve diğer hemşirelerle iletişimi kolaylaştırabilir. Tıbbi açıklamaları hastanın anlayabileceği şekilde basitleştirmeye yardımcı olabilir(14).

Bilgi Kaynağı Olarak ChatGPT

ChatGPT, literatür araştırmaları yaparak hastalık, tedavi veya ilaçlar hakkında güncel bilgiler sunabilir. ChatGPT tıbbi bilgilerinin tamamını internet yoluyla sağlamaktadır. Güvenlik nedeniyle internet ulaşımı sınırlıdır. Ancak bilgileri eğitim yapıldığı yıllarla sınırlıdır. ChatGPT 3 Mayıs 2021 yılına kadar olan bilgilerle eğitilmiştir(1). Sonrası için bilgi sağlamamaktadır. Ayrıca bazen bulamadığı bilgileri uydurabilmektedir. Bu yüzden alınan bilgilerin tekrar kontrolü gerekmektedir(15).

ChatGPT tıp eğitiminde faydalı olabilir. Kısa soru-cevaplar, vaka senaryoları, kaynak önerileri, tanı ve tedavi için karar vermede destek, çeviri, kişiye özel öğrenme tavsiyeleri, sürekli eğitim destek vererek, bilgi paylaşımını kolaylaştırarak, sağlık çalışanlarına geri bildirim ve değerlendirmeler sağlayarak, tıbbi görüntü ve bilgilerin değerlendirilmesinde yardımcı olarak kişilerin öğrenmesine yardımcı olabilir(16).

Akademik araştırmalar yapılmasında ve makale yazımında da yardımcı olabilir. Özet yazmada, literatür araştırmasında, verileri veya bilgileri özetlemede, yapı, referanslar ve başlıklar için öneriler sağlamada, metni daha okunabilir hale getirmek için dil incelemelerinde ve hatta bir makalenin tam taslağını oluşturmada yardımcı olabilmektedir(17).

Avantajlar ve Potansiyel Zorluklar

ChatGPT'ye her an her yerden erişilebilir ve hızla yardım sağlayabilir. Cep telefonları için mobil uygulamaları mevcuttur ve birçok dilde konuşarak anlaşmak mümkündür. Rutin işlemleri yapabilir. Hasta sorularına cevap verebilir. Bunları hastanın tıbbi bilgisine göre basitleştirebilir ve sağlık personelinin daha karmaşık işlere ayıracağı zamanı arttırabilir.

Hastaların ve sağlık profesyonellerinin tıbbi bilgiye kolayca erişmelerini sağlayarak eğitimi teşvik edebilir.

ChatGPT'nin sağladığı bilgilerin her zaman doğru ve güvenilir olması sağlanmalıdır. ChatGPT'nin bilgileri eğitim yapıldığı yıllara sınırlıdır. Tüm bilgileri güncel olmayabilir. Eğitiminde olmayan bilgilerle ilgili bir soru geldiğinde bazen yanlış tahminlerde bulunabilmekte veya olmayan kaynaklar üretebilmektedir(18). Veri önyargısı, yapay zeka modellerinin eğitim verilerinde oluşabilecek sistematik önyargılar veya gerçek dünyayı tam olarak temsil etmeyen veriler nedeniyle yanlış veya adil olmayan tahminler yapmasına neden olabilir. Bu algoritmalar sadece eğitildikleri bilgilere dayanarak içerik üretebilir ve yeni fikirler üretme kapasitesine sahip değildir. Dolayısıyla, ChatGPT gibi modeller, eğitildikleri verilerdeki önyargıları bilmeden veya istemeden bile devam ettirebilir. Ayrıca, ChatGPT'nin çıktıları, modelin gelecekteki tekrarlarını eğitmek için kullanılabilir, bu da veri önyargısının insan müdahalesi olmadan artarak devam edebileceği anlamına gelir. ChatGPT'nin güvenli ve etkili bir şekilde sağlık hizmetlerinde

kullanılabilmesi için klinik uzmanlar tarafından eğitilmesi ve doğrulanması gerekmektedir. Bu doğrulama süreci, ChatGPT yanıtlarının güvenilirliğini artırabilir ve hasta bakımına fayda sağlayabilir(19).

ChatGPT'nin teşhis ve tedavi yeteneği sınırlıdır. Fizik muayene yapamaz. Görüntüleri değerlendirmesi sınırlıdır. Algoritmaya dayanan tanı ve tedavilerde iyi sonuç verse de karmaşık vakalarda yanlış kararlar verebilmektedir(20,21).

Etik ve Hukuki Sorunlar

ChatGPT'nin kullanımında hasta verilerinin güvenliği sağlanmalı ve gizlilik korunmalıdır. Hassas hasta bilgilerinin gizliliği ve korunması önemlidir. Yetkisiz erişim veya veri ihlalleri riskleri vardır. ChatGPT, tıbbi geçmişler, test sonuçları, teşhisler ve diğer hassas veriler gibi kişisel sağlık bilgilerini toplayabilir ve saklayabilir. Verilerin korunması, hasta mahremiyeti ve geçerli mahremiyet düzenlemelerine uyulması kritik önem taşır. Yeniden kimlik tespiti riski de vardır. Şeffaflık da önemlidir ve hastalara, verilerinin nasıl kullanılacağı konusunda bilgi verilmelidir. ChatGPT'nin doğal dil işleme ve makine öğrenme özellikleri gizlilik riski oluşturabilir. Her aşamada izleme ve denetleme gerekmektedir. Sağlık kuruluşları, güvenlik önlemleri ve veri yönetimi çerçeveleri kullanarak gizlilik risklerini azaltmalıdır(19).

Chat GPT tıbbi açıdan yanlış önerilerde bulunabilir. Yasal olarak hasta zarar gördüğünde ChatGPT tarafından verilen bilgilerin ve önerilerin son sorumluluğu kimin taşıdığı açıkça belirlenmeli ve ChatGPT kullanımında hasta ile ilgili her kurum ve kişinin sorumluluklarının yasal çerçevesi de belirlenmelidir(19).

Sonuç

ChatGPT gibi dil modelleri, tıp alanında hastaların danışmanları, teşhis yardımcıları ve bilgi kaynakları olarak faydalı olabilir. Ancak, doğru kullanımı, güvenilirlik ve etik konular dikkate alınarak sağlanmalıdır. Bu teknoloji, tıbbi bakımın geleceğinde önemli bir role sahip olabilir ve insan doktorlarla birlikte iş birliği içinde daha etkili ve erişilebilir sağlık hizmetlerinin sunulmasına katkı sağlayabilir.

Çıkar Çatışması: Yazar çıkar çatışması bildirmemiştir.

Finansal Destek Beyanı: Yazar finansal destek bildirmemiştir.

Yazar Katkısı: Yazı tek yazarlıdır.

Etik Beyan: Yazar araştırma ve yayın etiğine uyduklarını beyan eder.

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