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Editorial

Kritik bakım; acil tıp ve tüm branşlar açısından hasta bakımının en zor olduğu alan. Kritik hastalar için yapılan müdahaleler çok farklı anlamlar taşıyor. Bu bilim alanına hizmet vermek amacıyla yayın hayatına başlayan dergimiz artık emekleme dönemini geçmiş kendi ayakları üstünde durabilecek bir hale gelmiştir. Yayın başvuruları hızlıca değerlendirilmekte ve süreç zamanında sonlandırılmaktadır. Bu sayımızda değişik konularda 6 araştırma makalesi ve iki olgu sunumuyla karşınızdayız.

Nörolojik hastalıklardan böbrek yetmezliğine solunum yetmezliğinden toksikoloji vakalarına çok değerli çalışmalar bu sayıda literatüre kazandırılıyor. Acil servislerden iki vaka sunumu da çeşitlilik sunuyor. Kritik hasta bakımı tüm organ birimleri için önem arz eden çok geniş bir alanı kapsamaktadır. Her branşa hitap etmekte olan dergimiz giderek artan sayıda uluslararası ve ulusal index tarafından taranmaktadır. Gelecek tıp dünyasında kritik hasta takibinin önemi daha iyi anlaşılacak bu hastalara bakan sağlık çalışanlarının değeri de daha iyi bilinecektir. Tabi bu süreç değişik ruh halleri nedeniyle bu hastaların bakımında gerekli adımları atamayan ve yoğun bakım kapatan idareciler olarak anılacak bazı kişiler için de geriye bakıldığında sadece bir utanç vesilesi olacaktır. Bu yayın çalışmaları kolay olmuyor. Yaptığınız çalışma ve araştırmalarla verdiğiniz katkı için şükranlarımı arz ediyorum.

Başarı dileklerimle
Prof. Dr. Başar Cander, Baş Editör

Critical care; it is the field where patient care is the most difficult in terms of emergency medicine and all branches. Interventions for critically ill patients have very different meanings. Our journal, which started its publication life to serve this field of science, has now passed its infancy and can stand on its own feet. Publication applications are evaluated quickly and the process is finalized on time. In this issue, we present 6 research articles and two case reports on different subjects.

Valuable studies from neurological diseases to kidney failure, respiratory failure to toxicology cases are brought to the literature in this issue. Two case reports from emergency services also offer variety. Critical patient care covers a very wide area that is important for all organ units. Our journal, which appeals to every branch, is scanned by an increasing number of international and national indexes. The importance of critical patient follow-up will be better understood in the future medical world, and the value of healthcare professionals caring for these patients will be better known. Of course, this process will only be an embarrassment for some people, who, due to their different moods, cannot take the necessary steps in the care of these patients and will be referred to as administrators who closed the intensive care unit, in retrospect. This publication work is not easy. I would like to thank you for your contribution to your work and research.

Best wishes
Prof. Dr. Başar Cander, Chief Editor

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Letter
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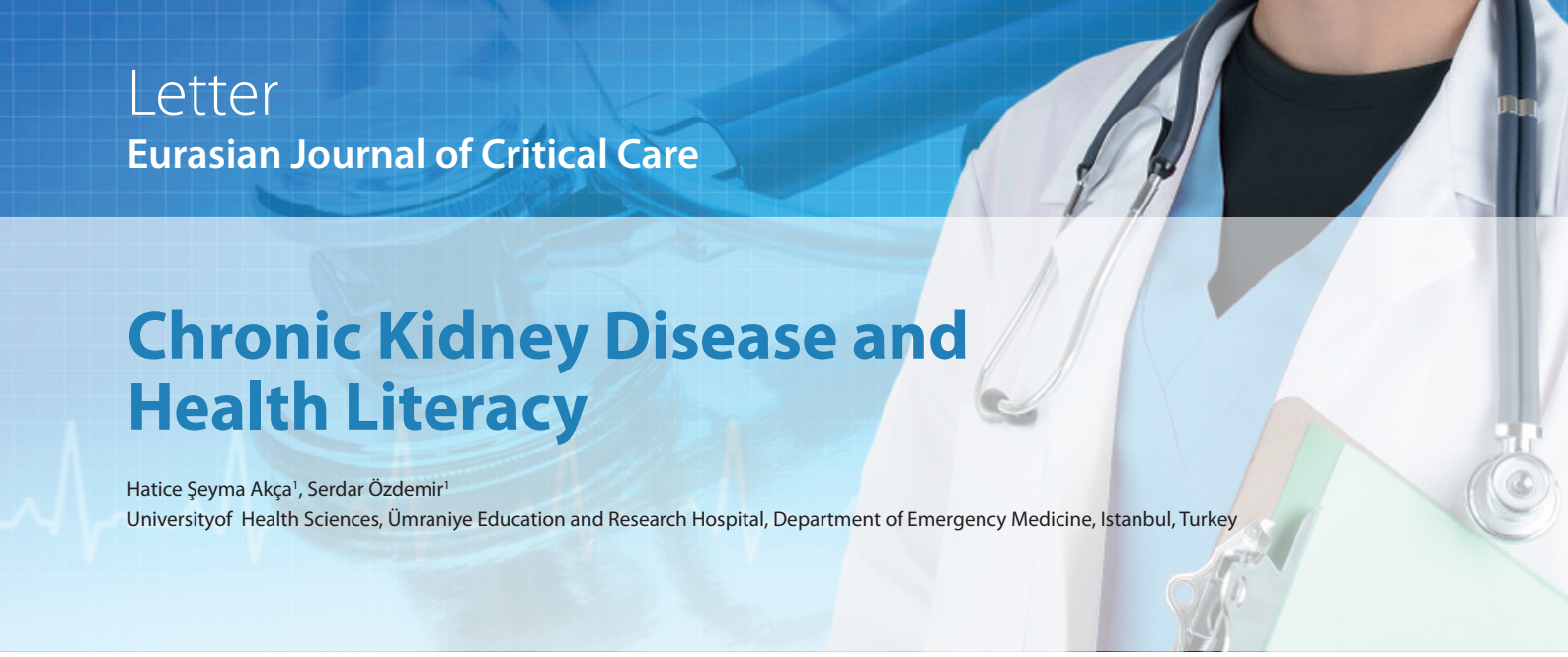

Chronic Kidney Disease and Health Literacy

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Abstract

We have read the article titled "Evaluation of The Awareness of Chronic Kidney Disease Among Patients Receiving Hemodialysis" prepared by Salman et al. with great interest.

Low level of health literacy is a worldwide public health problem. This causes people to do wrong medical practice, not to recognize diseases and to reach the right treatment when they get sick[3].Salman et al. reported that chronic kidney disease awareness of the patients receiving hemodialysis was low . In another study, the authors suggested that health literacy may be important, especially in the access of patients scheduled for transplantation and in the management of comorbidities

Key words: Chronic Kidney Disease, Health Literacy

We have read the article titled "Evaluation of The Awareness of Chronic Kidney Disease Among Patients Receiving Hemodialysis" prepared by Salman et al. with great interest[1]. We thank the authors for this informative and successful manuscript. We also would like to mention a few important points about awareness of disease among patients and health literacy.

In 1974, the concept of health literacy was first used by Simond[2]. The widespread use of the concept took more than 20 years. The concept of health literacy is used to assess people's knowledge of health practices, their ability to interpret health-related information, and their ability to access that information[3]. Low level of health literacy is a worldwide public health problem[3]. This causes people to do wrong medical practice, not to recognize diseases and to reach the right treatment when they get sick[3].

Salman et al. reported that chronic kidney disease awareness of the patients receiving hemodialysis was low1. Similarly, Taylor et al. showed that health literacy is associated with adverse clinical events, increased healthcare use, and mortality among patient with chronic kidney disease in their systematic review published in 2018[4]. Another study investigated the relationship between self-management and decision-making skills and health literacy in patients with chronic kidney disease[5]. In this study, the authors suggested that health literacy may be important, especially in the access of patients scheduled for transplantation and in the management of comorbidities[5].

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Orginal Article
Eurasian Journal of Critical Care

Can We Predict the Width of the Infarct Area in Patients with Acute Ischemic Stroke Using Near Infrared Spectrophotometry?

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Abstract

Background and Purpose: The purpose of this study to determine whether an association exists between near infrared spectrophotometry (NIRS) measurements and affected brain tissue by using NIRS to measure cerebral oxygenations in patients brought to the emergency department with acute ischemic stroke (AIS).

Methods: Thirty-one patients diagnosed with ischemic stroke at diffusion weighted magnetic resonance imaging (MRI) of the brain, aged or over, with no history of ischemic or hemorrhagic stroke and diagnosed at the Recep Tayyip Erdoğan University Education and Research Hospital emergency department, Turkey, were included in the study. Patients with foci of intracranial hemorrhage at cranial computerized tomography (CT) of the brain and no ischemic area identified at brain diffusion MRI were excluded. Cerebral saturation was recorded after being measured for at least 10 min with an INVOS 5100C cerebral/somatic oximeter (Covidien).

Results: Mean age of the 31 patients presenting to the emergency department with AIS was 76.32 ± 10.26. Sixteen (51.6%) were female. Mean Glasgow Coma Score (GCS) was 12.68 ± 3.16. Mean oxygenation values of the ischemic areas in these patients were 57.03 ± 9.03 (min: 40, max: 81), while the mean measurement from areas with no cerebral changes was 67.13 ± 9.64 (min: 54, max: 89) (p<0.001). Mean dimension of the ischemic areas visualized at diffuse MRI was 979.77 ± 635.85 mm2 (min: 43, max: 2180). A positive moderate correlation was observed between ischemic area dimensions and cerebral oximeter values for those areas (r=0,597, p=<0.001). The linear regression model established between patients' ischemic area diameters and level of decrease in cerebral oxygenations revealed a fall in cerebral oxygenation of 5.945 + (0.005 x infarct area (mm2)).

Conclusion: We conclude that that greater the fall in cerebral oxygenation levels the greater the dimensions of the ischemic area. NIRS may be a method that can be used in predicting width of infarct area in patients with AIS.

Key words: Acute Ischemic Stroke, Near Infrared Spectrophotometry, Infarct Area

Introduction

Acute ischemic stroke (AIS) is a disease that leads to death and permanent disabilities, and that must therefore be recognized and treated quickly[1,2]. Emergency departments are places to which these patients present first and where care and treatment plans are prepared. The aim during emergency care is to assess cerebral perfusion and to reduce potential neuronal injury to a minimum[3]. Near infrared spectrophotometry (NIRS), which first entered in to clinical use in the assessment of cerebral perfusion during cardiac surgery in the 1970s, has today become the most effective method of observing cerebral tissue oxygenation[4]. NIRS has the potential to assess cerebral blood volume and saturation and oxy- and deoxyhemoglobin concentrations in patients with AIS in a non-invasive manner. In addition to ease of bedside use, the fact that it is non-invasive and not user-dependent permits the assessment of brain oxygenation in patients with AIS in the emergency department[5].

NIRS has recently begun being used in various fields, such as neurological observation after trauma and surgery and in resuscitation[6-8]. NIRS measures mixed venous/arterial oxygen saturation of the cerebral cortex from the frontal lobe of the brain. Venous oxygen saturation is a marker of local tissue oxygen consumption, and therefore of oxygen distribution and perfusion. A typical NIRS monitor has a light source attached to the probe and one or more photo-detectors and various distances on the other side to the light source. The probe is applied to the region to be measured. Rays reflected by the light source are collected in the photo-detectors. The difference between oxygenized and deoxygenized hemoglobin absorption is measured mathematically and information can be obtained concerning tissue oxygenation. Photo-detectors close to the light source (approximately 3 cm away) receive superficial light rays (from skin, bone and fatty tissue), while the more distant photo-detectors (approximately 4 cm away) perceive light rays from the skin (both from extracranial tissue and from brain tis-

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sue). Since the light absorption wavelengths of oxy- and deoxyhemoglobin are different, calculations can be performed between the emitted and received infrared light rays[9]. This makes it possible to assess tissue oxygenation.

The purpose of this study was to assess whether or not there is an association between cerebral oxygen saturation and width of ischemic area in patients with AIS.

MATERIALS-METHODS

Study design

Following receipt of Recep Tayyip Erdoğan University ethical committee approval, the study was performed at the Recep Tayyip Erdoğan University Rize Education and Research Hospital Emergency Department. Our hospital is a tertiary health institution according to applicable conditions and criteria in Turkey, and the emergency department serves an average of 150,000 patients a year.

Patient characteristics

Age, sex, additional diseases, vital findings and physical examination findings at time of presentation to the hospital emergency department, laboratory test results, imaging tests, in-hospital prognoses and time of onset of symptoms were recorded. Patients aged over 18, with no history of any previous ischemic or hemorrhagic stroke and with AIS diagnosed at brain diffusion MRI were included. Patients with hemorrhage detected at CT of the brain or with diseases such as chronic obstructive pulmonary disease, anemia or hyperbilirubinemia that might affect cerebral oxygenation measurements, and patients aged under 18 were excluded.

Patients with no pathological findings of intracranial hemorrhage at CT of the brain were assessed using diffusion MRI (Figure 1). Ischemic areas identified at diffusion MRI images recorded on the hospital computer system were re-assessed by a specialist radiologist. The ischemic area was calculated as mm^2 from the widest diameter of that area.

Cerebral oximetry measurement

All patients with findings of AIS are cared for on the basis of the guideline prepared for healthcare professionals by the American Heart Association/American Stroke Association. Care for patients in the emergency department is provided by three-member teams, consisting of a physician, a nurse and a paramedic. The nurse monitored and recorded cerebral oxygenation. Cerebral saturation was measured using an INVOS 5100C cerebral/somatic oximeter (Covidien). Oximeter probes were attached to the appropriate areas of the frontal region. The cerebral saturations of patients with ischemic area findings at diffusion MRI were measured over at least 10 min and recorded. Cerebral oxygenation measurements were performed from both the region with ischemic changes and also from the region with no ischemic changes.

Statistical Analysis

Descriptive statistics were expressed as frequency, percentage, mean (mean), standard deviation (SD) and median, minimum (min) and maximum (max) values. Normality was tested using the Shapiro Wilks test. Differences between cerebral oxygenation measurements from the region with ischemic changes and those from the region with no ischemic changes were analyzed using the paired samples t test. Relations between non-normally distributed variables were analyzed using the Spearman correlation test and those between normally distributed variables using the Pearson correlation test. Linear regression analysis was used to determine relations ischemic area diameter and amount of fall in oxygenation between the lobe in which cerebral ischemia occurred and the lobe with a normal perfusion value. $p<0.05$ was regarded as significant. Analyses were performed using SPSS 18.0 (SPSS, Chicago, IL).

Results

Mean age of the 31 patients in the study was 76.32 ± 10.26 years. Sixteen (51.6%) of patients were female and 15 (48.4%) male. Mean systolic artery pressure at time of presentation was 154.52 ± 36.77, and mean Glasgow Coma Score (GCS) was 12.68 ± 3.16. Mean Rankin scores were 3,48 ± 1,8 and mean NIH scores 14,13±8,26. Mortality occurred in 8 (25.8%) cases. Patients' demographic and characteristic features are shown in Table 1.

Mean cerebral oxygenation value measured in the ischemic brain lobe was 57.03 ± 9.03 (min: 40, max: 81). Mean oxygenation value in the cerebral region without ischemic changes was 67.13 ± 9.64 (min: 54, max: 89). A significant difference was determined between oxygenation values measured in the region with ischemic changes compared to that with no such change ($p<0.001$). rSO_2 in the ischemic areas was lower than that in the non-ischemic areas (Table 2).

Table 1: patients' demographic and characteristic features

Characteristics	
Age (mean±SD)	76.32 ± 10.26
Sex F/M	16/15
Systolic BP (mean±SD)	154.52 ± 36.77
GCS (mean±SD)	12.68 ± 3.16
NIH score	14,13±8,26
Rankin score	3,48 ± 1,8
Prognosis ex/alive	8/23

Table 2: Cerebral oximetry values – NIRS measurement values – in patients' ischemic and non-ischemic areas

Variable	NIRS measurement values Mean (SD)	NIRS measurement values Median (min – max)	p
Ischemic area	57.03 (9.03)	57 (40-81)	<0.001*
Non-ischemic area	67.13 (9.64)	64 (54-89)	

Mean fingertip pulse oximetry measured at time of presentation was 97.71 ± 5.17, mean hemoglobin value 13.33 ± 1.67 and mean glucose value 152.42 ± 83.62.

Mean dimension of the ischemic areas seen at diffusion MRI was 979.77 ± 635.85 mm^2 (min: 43, max: 2180). No statistically significant difference was determined between size of patients' ischemic areas and fingertip saturations (p>0.05). A low, negative correlation was determined between size of ischemic area and rSO_2 values in the same region (r= -0,372; p=0.040). Cerebral saturation values in the same region decreased as the size of ischemic area increased. A moderate positive correlation was determined between differences in rSO_2 measurements between ischemic and non-ischemic brain lobes and size of ischemic area (r=0,597, p=<0.001). (Table 3) GCS values decreased as the difference between rSO_2 values for the ischemic area and those for the non-ischemic cerebral region and the areas of the ischemic regions determined at diffusion MRI increased. A negative, low level correlation was determined between these values (r= -0,368; p=0.041).

The linear regression model in which the level of decrease in oxygenation between the lobe in which cerebral ischemia occurred and the lobe with normal perfusion was regarded as a dependent variable, and the dimension of the ischemic area as an independent variable was significant (F=17,407; p<0.001). In the model established, the diameters of patients' ischemic regions explains 35.4% of the decrease in cerebral oxygenation (Adj R^2= 0,354). The linear regression model established was as follows: amount of decrease in cerebral oxygenation = 5.945 + (0.005 x infarct area (mm^2)) (Table 4).

Table 4: Correlation and regression analysis of patients' rSO2 values

Variables	Spearman Correlation		Linear Regression Model
	p	R	
Dependent Variable (y): Decrease in NIRS measurement values	<0.001	0,597	y= 5,945 + (0.005. x)
Independent Variable (x): Ischemic area size in Diffusion MRI (mm^2)			t= 4,172; p<0.001 F=17,407; p<0.001 R^2=35.4%

Discussion

A negative correlation was determined in this study between the area of ischemic brain tissue and cerebral saturation. Cerebral saturation decreased as ischemic area increased. Although the literature contains various studies in which cerebral functions and neuronal injury were assessed using NIRS[10-12], our study is the first to compare size of the ischemic areas in cerebral tissue in AIS with cerebral saturation measurement values.

NIRS used for the purpose of monitoring cerebral oxygenation, particularly during cardiovascular surgery, has recently begun also being used in various other fields, including resuscitation. In a previous study of ours involving patients with out-of-hospital cardiac arrest we determined that brain oxygenation would be useful in predicting patients' spontaneous circulation. Survival among patients with increases in rSO_2 values at time of presentation to the emergency department greater than 16% in the right lobe and 20% lobe in the left lobe was 9 times higher than that of patients with values less than 16% and 20%, respectively[8]. One study in which cerebral saturation values were associated with mortality was performed by Nardi et al. on patients with sepsis. They reported lower discharge and greater mortality among patients hospitalized in the intensive care unit with low rSO_2 values[13]. If size of infarct area in AIS is thought to be directly associated with mortality, then the determination of a large infarct area in patients with lower cerebral oxygenation in our study and the idea that NIRS may be useful in predicting the size of the infarct region are not unexpected[14-17].

Diffusion weighted MRI has high specificity and sensitivity in showing injury in the brain in the acute period in patients with symptoms of AIS[18,19]. However, this imaging technique is not available in many hospitals and its use in unstable patients at time of diagnosis in the emergency department is limited[20,21]. The low rSO_2 values in this study and the correlation determined between rSO_2 measurement

Table 3: Correlation between ischemic area cerebral oxygenation and size of ischemic area, fingertip pulse oximetry and hemoglobin and glucose values

Variable	Correlation Coefficient	p
Size of ischemic area #	-0,372	0.040*
Fingertip oxygen saturation #	0,037	0.844
Hemoglobin +	0,167	0.369
Glucose #	0,144	0,440

* p<0.05; #Spearman Correlation Test; + Pearson Correlation Test

values and size of infarct area support the idea that NIRS can be used as an assistant technique to physical examination and other tests in assessing patients with AIS.

The dimensions of the ischemic area can be estimated with the linear regression model we established. The size of the infarct area can be determined using the increase in the difference between rSO_2 measurements in the ischemic and non-ischemic areas. We think that since the size of the infarct area affects the patient's prognosis, prognosis can be predicted using this technique. Heringlake M et al. reported that short-term mortality increased when the rSO_2 values of patients fell below 51% during cardiac surgery. Although they suggested that several factors can affect mortality, they proposed the level of decrease in rSO_2 values as the main cause. The findings of that study may be associated with the determination of infarct area being correlated with rSO_2 measurements[22].

Limitations

The most important limitations of this study are that it was performed in a single institution and with a low number of patients. However, we think that future studies with larger patient numbers will support our theory. Another limitation is that our patients were not monitored with NIRS in the long term. Patients' cerebral infarct areas in the acute period may not be the same as those in subsequent days. We might have determined lower rSO2 values as the infarct area increased. We think that future studies in which patients are monitored with NIRS for more than 24 h and which compare the results with control brain diffusion MRI will support our findings. Another disadvantage of this study is that we did not classify patients depending on stroke subtypes. Future studies based on subtypes should support our own study.

Conclusion

The level of decrease in cerebral oxygenation measured using NIRS was correlated with size of ischemic area in this study. We conclude that the greater the decrease in the level of cerebral oxygenation, the greater the size of the ischemic area. Although scores such as GCS, NIH and Rankin score are used in the evaluation of patient mortality, we think that rSO2 measurements can also be used in estimating patients' mortalities and ischemic areas.

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Orginal Article
Eurasian Journal of Critical Care

Effect of Using Metoclopramide and Ondansetron in the Emergency Department on the Treatment Duration

Oya Güven[1]*, Özlem Tataroğlu[2], Dilay Satılmış[3], Mehmet Özgür Erdoğan[4]
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Abstract

Objective: The complaint of nausea and vomiting can be a symptom or result of many diseases. It may impair the comfort and even the general condition of the patient. Therefore, patients admitted to the emergency room expect to correct these complaints as quickly as possible. The most commonly used drugs for this are metoclopramide and ondansetron.

Materials and Methods: In our study; a one-month period, 99 patients who presented to our emergency department with complaints of nausea, vomiting, and diarrhea due to any disease were included (excluding trauma and cancer patients). It was noted how quickly the symptoms decreased when metoclopramide 10 mg or ondansetron 8 mg were administered intravenously.

Results and Conclusion: After antiemetic application in the emergency room; We observed that the complaints disappeared more rapidly in patients treated with ondansetron than in patients treated with metoclopramide (mean 16/ minute, p<0,005).

Key Words: Nausea, Metoclopramide, Ondansetron, Emergency Service

Introduction

Nausea and vomiting can be symptoms as well as consequences of many diseases. It is an important indicator regarding the prognosis of the disease. For example, if it is seen after a head injury, it is accepted as an indicator of serious conditions such as bleeding and fracture. Although vomiting is most common in gastrointestinal system diseases, if it progresses to disrupt oral nutrition, it may cause dehydration and kidney failure, and even aspiration pneumonia in elderly and post-op patients.

Stimuli giving rise to nausea and vomiting originate from visceral, vestibular, and chemoreceptor trigger zone inputs which are mediated by histamine/acetylcholine and serotonin/dopamine, respectively. These relationships serve as the basis on which current pharmacological therapy for nausea and vomiting is recommended[1,2]. Therefore anticholinergics, antihistamines, phenothiazines, corticosteroids, butyrophenones, 5-HT3 antagonists, cannabinoids, benzodiazepines, NK-1 receptor antagonists and benzamides may be used for the treatment of nausea and vomiting.

In this article; In antiemetics, we use it frequently; We will try to examine the effect of intravenous administration of metoclopramide (from benzamides) and ondansetron (one of the 5-HT3 antagonists) on the duration of stay in the emergency room.

Materials and Methods

In our study, male and female patients over age 18 who were admitted to our emergency service with nausea and diarrhea within one month were included. Trauma and cancer patients were not included in the study. It was accepted that they gave 10 points for nausea at the time of application to the patients and they were asked to inform us when they could give 0 points after drug administration. Thus, we observed that her/his complaints were completely resolved. 10 mg metoclopramide or 4 mg ondansetron slowly intravenous (IV) medication to the patients, what drug was administered by the single-blind method without being told. Demographic characteristics, decrease in nausea after few minutes after drug administration, and development side effects were noted. Patients who need received repeated medication were excluded from the study. The distribution of variables was measured with the Kolmogorov Simirnov test. Mann-Whitney U test was used to analyze quantitative independent data. Chi-square test was used in the analysis of

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qualitative independent data. SPSS 27.0 program was used in the analyzes. p <0.05 was considered significant.

Results

99 patients were included in our study. 56 (56.6%) of them were women and 43 (43.4%) were men. The average age of the patients was 34. Patients; Those with only nausea complaints or diarrhea and nausea were divided into 2 groups. All patients had nausea, 78 (78.8%) patients had diarrhea and nausea. 51 (51.5%) patients were administered ondansetron, 48 (48.5%) patients were administered metoclopramide slowly IV. Ondansetron was given to 40 patients with diarrhea and nausea and 51 patients with only nausea. There was no significant difference between the 2 groups in terms of the duration of their symptoms (p>0.005).

The complaints of the patients who were given ondansetron decreased in an average of 16 (15.9±2.1) minutes, while those of the patients who were given metoclopramide decreased in an average of 48 (47.5±9) minutes. Therefore, the average duration of observation was significantly longer for patients receiving metoclopramide than for those receiving ondansetron (p<0,005) (Table-1).

No side effects were observed with either drug application.

Discussion

The underlying mechanisms involved in nausea are complex and encompass psychological states, the central nervous system, autonomic nervous system, gastric motility, and the endocrine system. To understand the pathophysiology underlying nausea, it is important to introduce the concept of the dynamic threshold. It is thinking that each individual has a threshold for nausea that changes minute by minute. At any given moment, the threshold depends on the interaction of certain inherent factors of the individual with the more changeable psychological states of anxiety, anticipation, expectation, and adaptation. This dynamic interaction likely explains the inter-and intra-individual variability that is typically encountered in the face of a nauseogenic stimulus[3].

Metoclopramide (4-amino-5-chloro-2-methoxy-N- (2 dimethylamino methyl benzamide) from the benzamides class is an old antiemetic agent that has been used widely in emergency services for nausea and vomiting as well as other gastrointestinal disorders. It is an antidopaminergic agent, centrally and peripherally acting, in order to enhance upper gastrointestinal motility without affecting its secretion. It is metabolized by the hepatic Cytochrome P450-CYP2D6 enzyme. Routes of administration include oral, intramuscular (IM), and intravenous (IV)[4,5]. The most common side effects; restlessness, drowsiness, fatigue and weakness. Rarely, insomnia, headache, oculogyric crisis, bowel disorders, paralysis of the speech and masticatory muscles or tetanus-like dystonic reactions, and extrapyramidal reactions such as akathisia may occur. Such reactions are temporary and disappear within 24 hours after drug withdrawal. In a study conducted on patients with head trauma; Metoclopramide was administered to 93 patients. Headache was the most common reported side effect (46.2%), followed by anxiety and drowsiness with (39.7%) and (27.9%); respectively. Fatigue reported in (24.7%). While dystonia was the least common and developed only in 5.3%. It was stated that another drug may be preferred instead of metoclopramide, as similar findings will be seen in the follow-up of patients with head trauma[6].

Serotonin 5-HT3 antagonists such as granisetron and ondansetron have utility in post-operative vomiting, post-radiation therapy, and in preventing chemotherapy-related emesis[7]. Their mechanism of action is mediated primarily through central 5-HT3 receptor blockade (mainly in the chemoreceptor trigger zone) and peripheral blockade of 5-HT3 receptors on intestinal vagal and spinal afferent nerves[8]. Routes of administration include oral, IM and IV. IV form is most commonly used in emergency medicine. The most commonly reported side effects (occurring in more than 10% of adults) include a headache, fatigue, dry mouth, malaise, and constipation. Some fewer common effects range

Table-1: Demographic characteristics of patients, complaints and effect of drugs

	Metoclopramide	Median	Ondansetron	Median	p
	Mean±SD/% n		Mean±SD/% n		
Age	38.8±17.6	32	40.3±19.9	38	0.889[m]
Gender F M	27 (56.3%) 21 (43.7%)		29 (56.9%) 22 (43.1%)		0.951[x2]
Complaint recovery time	47.5±9	48	15.9±2.1	16	**0.000[m]**
Diarrhea (+) (-)	38 (79.2%) 10 (20.8%)		40 (78.4%) 11 (21.6%)		0.929[x2]
Nausea	48 (97.9%)		51 (100%)		1.000[x2]

SD: Standard Deviation, F: Female, M: Male, m: Mann-Whitney U test, x^2: Chi-Square test

from central nervous system (CNS) manifestations, such as drowsiness and sedation to local injection site reactions and pruritus. A transient increase in liver function tests has been reported as well. Although typically clinically insignificant, ECG interval changes such as QTc elongation can be seen. These changes typically take place within 1 to 2 hours after administration with a return to baseline within 24 hours. As with any medication that causes QTc elongation, there is a concern for Torsade de Pointes and other arrhythmias. However, this drug-related effect can be seen when administered at a dose of 16 mg or more[9]. Since we administered 8 mg to our patients, we did not observe this side effect. There is no known antidote to ondansetron, and supportive measures are used for overdose. In this respect, it is safe as long as side effects are followed.

In a study conducted; Metoclopramide, ondansetron and placebo were administered preoperatively to patients undergoing cholecystectomy. Nausea complaints were observed for 24 hours after surgery. The incidence of vomiting was 8% for metoclopramide, 4% for ondansetron, and 22% for placebo in the post-anesthesia care unit or day surgery[10].

In another study conducted with pregnant women diagnosed with hyperemesis gravidarum; Patients who were administered ondansetron stated that their nausea disappeared more rapidly within 24 hours compared to patients who were administered metoclopramide. Thus, the duration of hospitalization has decreased[11].

In our study, the nausea complaints of the patients who were applied ondansetron were faster than the other group and the duration of hospital stay was shorter. This situation can be discussed for the time that our patients' nausea complaint completely passed.

In our country, the use of metoclopramide in emergency services is quite common. This may be due to the lack of a habit of using ondansetron. Ondansetron, which started to be used in our country in the 90's; It was primarily used in patients receiving cancer treatment. It was later that the emergency physician met ondansetron. Therefore, the emergency physician; During her/his education, she/he continued use whatever treatment she/he received, as well as her/his order. Another reason is; Metoclopramide may be used more because it is less expensive.

Study Limitations

There are some limitations in our study. The number of patients was also fewer, as the patients who were admitted to our emergency department in a short period of 1 month were included. In addition, since we did not administer additional doses of medication to patients whose nausea did not completiy, we could not observe possible side effects that may develop as a result of high doses of medication (Because patients whose nausea did not recover were excluded from the study). Therefore, it is difficult to say that both drugs are innocent.

Conclusion

In emergency services; Although the price is high, we hope the use of ondansetron with a shorter duration will become widespread. Perhaps the fee and frequency of use can be regulated.

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Orginal Article
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Pre Hospital Cutting-Punching Tool Injuries At Emergency Health Services: Konya Sample

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Abstract

Introduction: Pre-hospital emergency healthcare workers are teams that go to thescene in case of emergency illness or injuryand start medicalcare.The reasons including the necessity to intervene in a narrow area, the movement of the ambulance and the rapid behavior increase the risk of injury with a cutting tool compared to the health care professionals.Objective of our study is to determine penetrating stab wound rate and reasons of health personnel employed at pre-hospital emergency health services.

Material/Method: This descriptive study was performed between January and April 2017.Konya 112 emergency service personnel were composed the universe of the study. The study data were prepared by researches without composing any sample was applied to 246 people who accepted to attend survey. SPSS 20 program was used to analyze the data.Significance level was determined as 0.05.

Findings and Conclusion: Totally 246 people attended to the study.15.0% of attendants to the survey had penetrating stab wounds.Women have more wounding risk than men(p=0,038);employed personnel at the centers have more wounding risk than employed personnel at the district center(p=0,010). No significant relation was found among age group, profession and wounding situation.43,2% personnel having penetrating stab wounds had only once,32.4% had twice,24.7% had injured more times.43.2% of wounds occurred in the vehicle is mobile.Branule caused wound in 56.7% rate and its 75.7% was contaminated.

Ambulance personnel's wounding rate was found considerably high.Wounding occurred mostly in ambulance.At the provided trainings, it should be emphasized that interventions should be done at the scene then the vehicle should move.

Key Words: Sharp objects, Injuring, Emergency Health Services

Introduction

Pre-hospital emergency health services cover the emergency health services provided until the patient / injured is delivered to the scene of the patient.[1] The basis of pre-hospital emergency health services in our country was established as 077 Hızır Emergency Department within the municipalities of Ankara, Izmir and Istanbul. Presently, pre-hospital emergency health services are carried out in the center by the Ministry of Health General Directorate of Emergency Services, and in the provinces by the units affiliated to the Provincial Ambulance Service Command and Control Center Head Office. Emergency medicine technician (ATT), ambulance and emergency care technician (AABT), nurse, health officer and drivers work in ambulances.

In Turkey; in case of emergency illness and injury in an area or province, the emergency call for an ambulance request is made to a single center. For our country, the phone number of this call center is 112. This number can be reached in any time by phone, free of charge. When 112 is called for an ambulance request, the call center staff will answer the call on the phone. ATT, AABT and call-handling personnel in call centers health units direct the nearest / most appropriate ambulance team to the scene. Ambulance team going to the scene makes the necessary intervention to the patient / injured at the scene and provides the transfer of the patient to the hospital if deemed necessary.[2]

People who work in pre-hospital emergency health services often make quick decisions when they go to the scene, act quickly and provide medical care to critical patients between the eyes of curious or stressed people in the environment. This makes ambulance employees a more disadvantaged group in terms of occupational health and safety than other healthcare professionals.

Abroad pre-hospital emergency medical services due to a stressful job due to the nature of the job "high risk" is defined as occupational group, ambulance transport operations in Turkey "people other jobs related to health" as a different headline evaluated hospitals hazard classification is differ-

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ent from running a "dangerous "as has been adopted.[3,4]

Risks that pre-hospital emergency healthcare workers face; It can be classified as ergonomic risks, physical risks, chemical risks, biological risks, environmental risks, psychosocial risks, other risks.

As a result of the studies, it has been shown that healthcare workers have 10 times more infectious diseases than other civilian employees.[5] These infection factors, which pose a threat to healthcare professionals, can be grouped into two main groups. The first group is the factors that are transmitted by contact with blood and bloody body fluids (from open wound, mucous membranes or skin with needle sticking). The other group is the respiratory-borne disease factors.

Any type of penetrating injury is an important risk factor for healthcare workers to spread blood-borne pathogens. Centers forDisease Control and Prevention (CDC) according to the estimates; percutaneous injuries in healthcare workers with approximately 385 000 injector needles and other cutting tools each year, and an average of 1000 injuries each day. Cutting-piercing tool injuries are primarily associated with Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human immunodeficiency Virus (HIV) occupational transmission. The risk of HIV that may develop after the needle sting after the infected patient is 0.3%, the risk of HCV is 3%, and the risk of HBV is reported as 6-30%.

Despite the fact that the vast majority of cutting tools used in the field of health are disposable reduced the risk for patients, it still continues to pose a risk to healthcare professionals.

Causes of intervention in a narrow area, lack of detailed information about the patient, movement of the ambulance, rapid behavior, insufficiency of light sources, lack of time for ambulance disinfection are the risk of infection due to respiratory, contact, needle sting, and injuries with cutting tools for pre-hospital emergency healthcare workers.[6,7] The purpose of our study is to determine the rate and causes of sharp piercing device injuries of those working in pre-hospital emergency health services.

Materials and Methods

This descriptive study was conducted between January and April 2017 for Konya Provincial Ambulance Command and Control Center (KKM) Chief Physicians. Between these dates, a total of 948 people wereactively working in the institution. KKM, administrative unit, logistics unit and training unit employees are not included in the study because there is no contact with the patient, and ambulance drivers are not involved in the treatment and injection processes. The universe of the research was accepted as 616. The study data were collectedface-to-face to all those who agreed to participate in the survey prepared by the researchers without any sampling.

In order to obtain the data of the research, a "Data Collection Form" was prepared by the researchers using the literature. The first part of the form consisted of questions to obtain data on the sociodemographic characteristics of employees such as age, gender, occupation, duration of employment in the institution, unit where they work. The second part consists of questions about injury experience, frequency, application-causing injury, medical instrument causing injury, contamination status of the instrument, and third part of the data related to the reporting status of the injury and the reasons for the failure.

During the evaluation of the data, the units where the people work were evaluated as central and district emergency health stations, occupational groups as Emergency Medical Technician (ATT), Paramedic-Emergency and Ambulance Technician (AABT) and Health Officer (SM) / Nurse.

Necessary public and ethical permissions were obtained for the research. SPSS 20 program was used in the analysis of the data. Statistics are given as numbers and rates (%). Independence checks among the variables that show categorical features were made with chi square test. Significance level was taken as 0.05.

Results

A total of 246 people participated in the study. 49.2% (n=121) of the participants in the study were women, 50.8% (n=125) were men, and 49.2% were under 20 years of age. Considering their distribution according to occupational groups, 66.3% were ATT, 20.3% were AABT and 13.4% were nurses / health officers. 50.4% of the participants were 6 or more and 64.6% of them were working in district stations (Table 1).

15.0% of the people who participated in the study were exposed to cutting-piercing tool injuries during their work in Konya emergency health services. 43.3% of those exposed to injuries stated that they were injured once, 32.4% twice, 18.9% 3 times and 5.4% 4 times with a cutting-piercing tool (Table 2).

When looking at the distribution of injury exposure according to the variables with the cutting-piercing tool; women had higher injury rates than men ($p = 0.038$), those working in the city center compared to those working in districts ($p = 0.010$), and those working for 6 years or more had less injury than those working for less ($p = 0.007$). There was no significant relationship between age group, occupation and injury status (Table 3).

75.7% of the penetrating device injuries occurred in the ambulance, 16.2% at the scene and 8.1% at the hospital (Table 4).

Considering the distribution of the exposure of the cutting tool to injury, according to the medical equipment causing the injury; 56.8% (n=21) of injuries occurred with injections and 21.6% (n=8) with injector needle tip. Of the

Table 1. Distribution of the participants in the study according to their socio-demographic characteristics

VARIABLES		n	%
Gender	**Women**	121	49,2
	Male	125	50,8
Age Group	**Under 20**	121	49,2
	20-29 Age	98	39,8
	30-39 Age	21	8,5
	40-49 Age	5	2,0
	50-59 Age	1	0,4
Profession	**ATT**	163	66,3
	AABT	50	20,3
	Health officer/ Nurse	33	13,4
Working Time	**0-3 Years**	45	18,3
	3-6 Years	77	31,3
	6 Years and above	124	50,4
Worked Unit	**Central Station**	87	35,4
	County Station	159	64,6
Total		**246**	**100**

Table 2. Frequency of Persons Exposed to Cutting-Drilling Tool Injury

		n	%
Injury exposure	**Yes**	37	15,0
	No	209	85,0
	Total	246	100
Injury frequency	**1 time**	16	43,3
	2 times	12	32,4
	3 times	7	18,9
	4 times	2	5,4
Total		37	100

37 injured people, 75.7% (n=26) stated that the equipment they were injured was contaminated, and 89.2% knew that the equipment was used (Table 5).

When distribution of injuries by time of injurywas evaluated, it was seen that the most common injury occurred most frequently at the time of use (46.0%) (Table 6).

Discussion

Gülen et al. in their studies for 1401 health personnel (1099 ATT and 302 AABT) working in 195 emergency health services stations in Istanbul; found that 52.2% of the workers were injured with a needle and 22.5% were injured with a sharp instrument.[8] 43.2% (n=389) stated that they injured more than once, 6.0% (n=54) twice, and 3.0% (n=27) more than twice. In astudy carried out by Akkaya et al. found that 56% of the participants were subjected to cutting piercing injuries, and the most common reason was the needle sting.[9] Uysal et al. found the rate of injury with a piercing device as 66.1% and the most common injury rate as 42.0% with nee-

Table 3. Distribution of exposure to injury by cutting-piercing tool by variables

		Yes n (%)	No n (%)	Chi square	p
Gender	**Woman**	24 (9,8)	97 (39,4)	4,283	0,038
	Man	13 (5,3)	112 (45,5)		
Age Group	**Under 20**	17 (6,9)	104 (42,3)	1,546	0,818
	20-29 Age	16 (6,5)	82 (33,3)		
	30-39 Age	4 (1,6)	17 (6,9)		
	40-49 Age	0 (0,0)	5 (2,0)		
	50-59 Age	0 (0,0)	1 (0,4)		
Profession	**ATT**	24 (9,8)	139 (56,5)	0,576	0,750
	SITA	9 (3,7)	41 (16,7)		
	SM / NURSE	4 (1,6)	29 (11,8)		
Working Time	**0-3 Years**	0	45 (18,3)	9,977	0,007
	3-6 Years	13 (5,3)	64 (26,0)		
	6 Years and above	24 (9,8)	100 (40,7)		
Worked Unit	**Central Station**	20 (8,1)	67 (27,2)	6,654	0,010
	County Station	17 (6,9)	142 (57,7)		
Total		**37 (15,0)**	**209 (85,0)**		

Table 4. Distribution of the cutting-edge tool injuries by location

	n	%
At the scene	6	16,2
While the vehicle is stationary in the ambulance	12	32,4
While the vehicle is in motion in an ambulance	16	43,3
At hospital	3	8,1
Total	**37**	**100**

Table 5. Distribution of the cutting and piercing tool injuries by medical equipment.

		n	%
Medical equipment causing injury	**Needle Tip (Injector)**	8	21,6
	Needle Tip (Inlet)	21	56,8
	Other	8	21,6
Equipment contamination status	**Contaminated**	28	75,7
	Not contaminated	9	24,3
Knowing the source of the equipment used	**Yes**	33	89,2
	No	4	10,2
Total		**37**	**100,0**

Table 6. Distribution of the cutting and piercing tool injuries by time of injury.

	n	%
During use	17	46,0
Before disposal after use	12	32,4
During the throw	5	13,5
After cleaning	1	2,7
After improper disposal	2	5,4
Total	**37**	**100,0**

dle-piercing in a study conducted by a research and application hospital staff.[10] Merih et al. freported the rate of injury to nurses as 22.8% in their studies in 2009.[11] In our study, the rate of injury with a cutting-piercing tool was found to be 15%.

In their study, Gülenet al. stated that 55.3% of the injuries occurred during the intervention and 34.7% of them were in the ambulance. The injury rate decreased with increasing age (p = 0.02, r = -0.63). Similarly, the injury rate decreased as the working time increased in 112 (p = 0.01, r = -0.43). It is noteworthy that the rate of injury has decreased over the years. In our study, contrary to this, more injuries were detected in those working 6 years or more. We can explain this by employing employees who are considered more experienced in the city center where there are more cases.

Gülen B et al.reported that 30.9% (n=278) of the injuries were in ambulance course, 25.6% (n=231) were moving fast, 15.6% (n=141) due to carelessness, 13.2% (n=119), due to the patient's movement, 11.5% (n=104) stated that the medical device was caused by the wrong destruction. In our study, while 75.7% of injuries were in the ambulance, the rate was 43.3% in cases where the ambulance was mobile.

10.5% of work-related injuries were reported to management in the work of Gülen B et al. 54.2% of the participants were trained to prevent work-related injuries.

Goel V et al. found that 476 reported injuries occurred with the highest rate of needle tip in their study on employees working in a tertiary care facility in North India. Injury rate in men (59.9%) was higher than women's injury rate (40.1%).[12]

Isaraet al. in a needle injury study at a hospital in Nigeria,80% of doctors and 70% of nurses determined that they were injured. They found that injuries were the most often 38% of the patient's motion, 26% during the re-fitting of the cap after use and 62% of the individuals did not report the injury.[13]

In the studies conducted by Amini M et al. in Iran-Tehran education and research hospitals, they found that the injuries occurred mostly with injector tips and that women had higher injuries than men. They found the rate of injury reporting as 33.5%.[14]

The striking factor in this study and similar studies made earlier emphasized that injuries are mostly caused by injectors and injections. Again, the fact that there are more injuries in the ambulance both in motion and in the interventions before moving is another remarkable reason.

In this context, the necessary precautions must be taken by the institutions in order to create a culture of employee safety in employees and to provide employees with high motivation, effective, fast and superior service in safe environments. Especially in terms of occupational health and safety, it is important to expand the use of personal protective equipment, and to procure and control it by institutions. The staff working in the ambulance should be given training about the diseases transmitted by blood, and the algorithm taught as a result of such an injury should be recommended to apply to a health institution as soon as possible and the in-service training should be updated periodically.

In addition, since the majority of injuries are in the ambulance and crime scene, it is thought that training pre-hospital healthcare workers on crisis management will reduce injuries with a positive effect on case and risk management.

One of the most important risks for emergency health professionals is ergonomic problems. To meet the protective properties of personal protective equipment to a high level, especially the gloves, vascular access markers, the safety of injectors / interactors equipped with safety will minimize injuries.

Some of the most important risks of those working in the emergency healthcare sector are the difficulty of coping with a large number of cases, long-term working conditions, the possibility of exposure to violence, monotonation and wear, and this creates a basis for injuries by reducing the work efficiency of the employees. Since this wear negatively affects the health of emergency workers, taking measures to increase motivation by institutions will positively affect occupational health. The evaluation of injuries within the scope of occupational disease will also have a positive impact on the future business life of employees.

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Orginal Article
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The Role of C-RP / Albumin Ratio in The Diagnosis of Stroke and an Overview of the Factors Affecting Hemispheres

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Abstract

Objective: Stroke has an important in emergency room admissions. Co-morbidities can increase the risk of stroke. Infection markers can be used in the diagnosis of stroke. The incidence of stroke originating from the left hemisphere has been reported more than the right. To investigate the accuracy of this situation; We tried to examine our patients who applied to our Emergency Department with stroke symptoms.

Materials and Methods: In our study, 1049 patients who presented to our Emergency Department with stroke symptoms and were diagnosed with stroke after neurology consultation were included in our study within 2 years. It was recorded retrospectively whether there was a previous stroke, gender, history of additional disease, infarction region, hemorrhagic or ischemic infarction, whether the C-RP (C-Reactive Protein) / albumin value contributed to this situation was examined. Findings were analyzed with SPSS statistical program, Chi-square and Mann Whitney-U tests.

Results: Between 2015 and 2017, 1049 patient findings were evaluated. Hemorrhagic findings were found in 74 (7.05%) of these patients, and ischemic infarction in 975 (92.95%). 875 (83.4%) of these patients had additional disease. Stroke originating from the left hemisphere was detected in 502 (47.9%) patients. C-RP, albumin, C-RP/ albumin values did not differ significantly ($p > 0.005$) in the group with hemorrhage and infarction.

Conclusion: Patients with chronic diseases, especially hypertension, chronic artery disease, diabetes and a history of previous stroke are in the high-risk group in terms of stroke risk. For this, treatment method or risk reduction, measures should be taken before stroke develops.

Key Words: C-RP/Albumin value, Diabetes, Hypertension, Left Hemisphere Infarction, Stroke

Introduction

The most common cases in the emergency room, among the cerebrovascular diseases are stroke (cerebrovascular disease: CVD) patients. Stroke is symptoms seen as a result of blockage in the vessels leading to the brain. Considering the localization and termination patterns of stroke symptoms, 4 basic clinical pictures are encountered[1]:

1. **Transient Ischemic Attack**: It is a transient focal neurological deficit that starts suddenly, usually lasts 5-15 minutes and resolves completely within 24 hours.
2. **Reversible Ischemic Neurological Deficit**: Neurological symptoms are temporary, but lasts longer than 24 hours.
3. **Progressive Stroke**: Neurological deficit begins suddenly, progresses for hours or days, and remains continuous in a certain plateau. It often occurs as a result of active occlusive thrombosis of the major cerebral artery.
4. **Completed Stroke**: It is a clinical condition in which neurological deficit develops in less than 6 hours.

In the classification used in the TOAST "Trial of Org 10172 in Acute Stroke Treatment" study, etiology was included in addition to clinical findings[2].

a. Large artery atherosclerosis (thrombosis or embolism).
b. Cardioembolic.
c. Small vessel occlusion (lacuna).
d. Ischemic stroke due to other identified causes.
e. Ischemic stroke of unknown cause.

The incidence of stroke has increased with the prolongation of life expectancy and the increase in the elderly population. Risk factors; It can be grouped under two headings, namely modifiable or non-modifiable (Table-1)[3]. Epidemiological studies conducted in recent years show that the mortality rate due to stroke has decreased. This situation is explained by the capture of even small ischemic areas with advanced imaging methods and the further development of clinical information. In addition, the treatment or regulation of modifiable risk factors plays a big role.

In stroke; Among the diseases that disrupt the vascular

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Table-1: Stroke risk factors

I. Non-modifiable risk factors	a. Age b. Sex c. Race d. Family history of stroke e. Genetic predispotion
II. Modifiable risk factors	**b. Less well documented**
a. Well documented	1. Metabolic syndrome
1. Hypertension	2. Alcohol or drug abuse
2. Smoking	3. Hyperhomocysteinemia
3. Diabetes or hyperglycaemia	4. Infectious diseases (C. Pneumonia, H.Pylori, CMV, periodontal diseases)
4. Cardiovascular Disease	5. Migraine
5. Carotid stenosis	6. High cholesterol
6. Atrial fibrillation	7. Sleep-disordered breathing
7. Hypercoagulability	
8. Dyslipidaemia	
9. Obesity	
10. Diet and nutrition	
11. Physical inactivity	
12. Oral contraceptive therapy	

*C. pneumonia: Clamidyadophila Pneumonia, H. Pylori: Helicobacter Pylori, CMV: Cytomegalovirus

wall structure in the long term, the most common chronic conditions we encounter are hypertension (HT), diabetes (DM), chronic artery disease (CAD). Acute changes in acute phase reactants such as CRP (C-Reactive Protein) or albumin also increase this risk.

In this study; We tried to examine how and why, which hemispheres are affected when patients with HT, DM, CAD and previous stroke have had a stroke, how the rates of CRP and albumin, which are among the infection markers, changed.

Materials and Methods

Our study included 1049 patients over 18 years of age who presented to the Emergency Service with stroke symptoms between January 1, 2015 and December 31, 2017, who were diagnosed with ischemic or hemorrhagic CVD by a neurologist, and whose radiological images were checked by a radiologist. The history and clinical findings of the patients were obtained retrospectively. The type of stroke was noted in patients with a CRP value above 5 mg / dl and an albumin value below 3.4 g / dl. Analysis was performed based on the hypothesis that the risk of stroke was increased in patients with chronic disease and a C-RP / albumin ratio> 1.7 (mean C-RP / albumin in all patients). In the descriptive statistics of the data, mean, standard deviation, median lowest, highest, frequency and ratio values were used. The distribution of variables was measured with the Kolmogorov Simirnov test. Mann Whitney-U test was used to analyze quantitative independent data. Chi-square test was used in the analysis of qualitative independent data. SPSS 27.0 program was used in the analyzes. p <0.05 was considered significant. The study was approved by the University of Health Sciences Haseki Training and Research Hospital Ethic Committee (19.12.2017/594).

Results

1049 patients with a diagnosis of stroke were included in our study. 436 of them (41.6%) were female, 613 (58.4%) were male. The average age of the patients was 67. Hemorrhagic in 27 (36.5%) of female patients, ischemic infarction in 409 (41.9%); In the male patients, 47 (63.5%) had hemorrhagic and 566 (58.1%) had ischemic infarction. In 657 patients (62.6%), the C-RP (C-Reactive Protein) value was significantly higher (5 mg /dl), 310 (47.2%) of these patients had a stroke originating from the left hemisphere. Hypoalbuminemia (3.4 g / dl) was found in 205 (19.5%) patients, 89 (43.4%) of these patients had stroke findings originating from the left hemisphere. In patients with hemorrhagic stroke, the C-RP value was 21.4 ± 44.1 (mean 6.8 mg / dl), albumin value 4.3 ± 4.4 (mean 3.9) g / dl; In patients with ischemic stroke, the C-RP value was 24.6 ± 45.1 (mean 6.6) mg / dl, and the albumin value was 4.2 ± 3.4 (mean 4) g / dl (Table-2).

Of the patients, 191 (18.2%) had previous CVD, 683 (65.1%) had HT, 247 (23.5%) had a history of chronic artery disease (CAD), and 335 (31.9%) had a history of DM (Some of the patients had more than one additional disease). Ischemic infarction in 179 (18.4%) of patients with previous CVD history, hemorrhagic infarction in 12 (16.2%); Ischemic infarction in 632 (64.8%) of HT patients, hemorrhagic infarction in 51 (68.9%); Ischemic infarction in 324 (33.2%) DM patients, hemorrhagic infarction in 11 (14.9%); Ischemic infarction was detected in 237 (24.3%) of CAD patients, and hemorrhagic infarction in 10 (13.5%) (Table-3).

In 502 (47.9%) patients in the left hemisphere, in 478 (45.6%) patients in the right hemisphere, in 38 (3.6%) patients in the other region (cerebellum, pons, corpus callosum), in 31 (3%) patients' bilateral lesion was detected (Table-4). Among the patients with left hemisphere lesions, 423 (49.9%) patients had ischemic infarction, and 79 (39.1%) patients had hemorrhagic infarction (p<0.05). We have detected left hemisphere stroke in 327 patients (47.9%) out of

Table-2: Demographic data and test results of the patients'

	Ischemic Mean±SD/%	Hemorrhagic Mean±SD/%	Total Average n/%
Age	61.9±15.5	66.9±13.2	**67**
Gender F:	409/%41.9	27/%36.5	436/%41.6
M:	566/ %58.1	47/%63.5	613/%58.4
CRP	24.6±45.1	21.4±44.1	6.7
Albumin	4.2±3.4	4.3±4.4	3.9
CRP/Albumin	7.8±16.9	6.3±14.6	1.7

†*SD: Standard Deviation, F: Female, M: Male*

Table-3: Relationship between comorbidity and stroke type

Risk Factors	Hemorrhagic n	Ischemic n	p
DM	11 (14.9%)	324 (33.2%)	0.001
HT	51 (68.9%)	632 (64.8%)	**0.476**
CAD	10 (13.5%)	237 (24.3%)	0.035
CVD	12 (16.2%)	179 (18.4%)	**0.645**

Table-4: Statistical distribution table in stroke patients according to the affected area

Area	Ischemic	Hemorrhagic	p
Right	377 (44.5%)	101 (50%)	**0,183** x^2
Left	423 (49.9%)	79 (39.1%)	0,007 x^2
Bilateral	29 (3.4%)	2 (1%)	**0,109** x^2
Others	18 (2.1%)	20 (9.9%)	0,000 x^2

‡ *x^2: Chi-square test*

683 patients with HT, 125 patients (50.6%) among 247 with CAD,174 patients (51.9%) among 335 patients with DM, and 86 (45%) patients out of 191 patients with previous CVD history detected.

Discussion

The risk of stroke increases with age in all chronic diseases that cause vascular pathology, especially hypertension and diabetes. Increasing the patient's C-RP / Albumin ratio also contributes to this situation.

In a study by Janghorbani et al; 116,316 women were followed up for 26 years, if they had diabetes, what type they were, and whether they had CVD according to obesity and blood pressure. They found that patients with DM were at higher risk than patients without DM, and that Type 1 DM patients had 4 times more risk and those with Type 2 DM had 2 times more risk. They observed that those with a history of DM and HT were in the higher risk group[4]. Also, in our study, patients with DM were in the highest risk group.

Pathophysiology of cerebrovascular disease patients with diabetes has not been characterized, but both large and small blood vessels appear to be affected. Potential underlying mechanisms include excessive glycation, endothelial dysfunction, increased platelet aggregation, impaired fibrinolysis, and insulin resistance. Associated dyslipidemia and hypertension probably contribute. Decreased fibrinolysis with increased coagulation and platelet aggregation in diabetic patients; may increase the risk of large artery infarction[5]. To reduce the risk of diabetes-related stroke, treatment of glycemia, hypertension, dyslipidemia, and platelet aggregation should be considered together.

The most common modifiable risk factors are hypertension. It is a major risk factor for both ischemic and hemorrhagic stroke. The higher the blood pressure, the greater the risk of stroke [6]. This risk is significant especially in patients with diastolic pressure greater than 110 mm / Hg[7].

Taking blood pressure under control not only protects from the risk of stroke but also prevents damage to other target organs (congestive heart failure, kidney failure). All antihypertensive treatments have been found to reduce the incidence of stroke by 35-44%. It has been emphasized in the latest treatment guidelines that blood pressure should be <140/90 mm / Hg. It was even thought that patients with diabetes would be protected at a lower blood pressure level. However, a large part of society is either undiagnosed or inadequately treated for hypertension[8,9].

In patients with hypertension; Atherosclerosis is accelerated and leads to occlusion of the large artery or lipohyaline degeneration in small arteries[10,11,12]. In a study conducted in hypertensive rats; Sympathetic nerve density was found to be higher in the left hemisphere than in the right hemisphere[13]. It has been suggested that blood pressure increases in patients with acute stroke due to increased sympathetic activity. This vicious circle can lead to more blockage of the artery.

Zia et al. Found that hemorrhagic stroke was more common in hypertensive patients than ischemic stroke. In this study, it was reported that either systolic or diastolic pressure elevation was sufficient alone[14]. In our study, the opposite was the case among hypertensive patients. In other words, the number of patients who had ischemic stroke was higher than those who had hemorrhagic stroke.

The reason why patients with a history of HT seemed to have low risk in our study; that maybe because we do not know the blood pressure value at the time of admission to the hospital and whether they used long-term antihypertensive drugs.

In a study by Yamori et al. with rats; They showed that the lesion was more in the left hemisphere in 1278 patients (73.4%) out of 1740 patients. The most prominent feature of these patients is that they are in the group with high blood pressure. In another similar study, they emphasized that hypertension, human blood factors, vascular wall disorder, and hypoxia factors may cause a risk for ischemic or hemorrhagic stroke[15]. In our study, in all patients with chronic diseases especially HT; the Left area lesion rate was higher than other area lesions.

According to TOAST criteria, HT and DM indirectly cause cardioembolic due to small and large vessel pathologies; It is the source of more than one etiology. Furthermore, patients with previous CVD also have existing vascular pathologies, they have a high risk for recurrent stroke.

C-RP is an acute-phase protein synthesized in hepatocytes in response to pro-inflammatory cytokines during infectious processes. It can be used as a biomarker of acute inflammation in ischemic stroke and atherothrombotic diseases. C-RP most likely recognizes the phospholipid com-

ponents of damaged cells and foreign pathogens and binds to phosphocholine, affecting the pathophysiological process of the inflammatory process[16]. Chang et al. found the C-RP count to be significantly higher in patients with ischemic stroke compared to controls[17]. We also found a similar finding in our study. Hypoalbuminemia, on the other hand, is an acute phase response associated with inflammation and oxidative stress. Various studies have shown a relationship between hypoalbuminemia and increased C-RP levels. It has been reported that it correlates with poor prognosis in patients with previous ischemic stroke. In a study, an improvement in the neurological deficit was observed when albumin therapy was administered following the formation of an acute intracortical hematoma[18]. Also, in our study; Hypoalbuminemia was more prominent in patients with ischemic stroke.

According to our study, patients with DM and CAD history are seen in a higher risk group for stroke, compared to patients with a history of HT and previous CVD. This situation; The limited number of our patients, the inability to check the patients' application and follow-up vitals, whether they receive treatment for their chronic diseases or stable in terms of these chronic diseases; whether smoking history or other diseases that cause vascular pathology such as heart disease or hyperlipidemia may have been caused. However; among HT, CAD, and DM patients, the number of patients with stroke originating from the left hemisphere was determined more than the patients with stroke in the other area.

The further occurrence of cerebrovascular pathology on the left side may be due to hemodynamic effects related to the specific anatomy of the carotid vessels. While the right common carotid artery originates from the brachiocephalic trunk (usually at right angles to the flow of the innominate artery), the left one arises directly from the aortic arch and runs in a more even line with the ascending aorta. There is a different flow in both arteries. In this case, energy transfer in the left carotid artery is greater than the right one, and left-sided stroke is more common. In hypertensive patients, this condition becomes more severe, and the incidence of ischemic or hemorrhagic stroke increases[19, 20, 21].

In 90% of individuals; speech, understanding of spoken and written language is controlled by the left hemisphere; thus, the left hemisphere is dominant in most adults[22]. The non-dominant hemisphere (usually the right hemisphere) is excelling in musical abilities, art, emotional intelligence, recognizing people from their faces, locating, and orientation (abstract skills that cannot be expressed in space and time). One of the more common causes of left hemisphere stroke cases is that the symptoms are pronounced from the outside. The relatives of the patients notice the symptoms and bring the patient to the hospital earlier. The most common of these findings is aphasia. Right hemisphere-originated stroke cases have unclear symptoms such as unilateral neglect, space and time disorientation[23].

Study Limitations

Since our study was retrospective, some limitations were determined: symptoms, vital signs, general condition of the patients during hospitalization, and follow-up after discharge could not be performed. In addition, conditions such as smoking and a history of hyperlipidemia, which also cause vascular pathology, could not be examined because they were not recorded. It is also unknown whether they have been treated for their chronic diseases.

Conclusion

In this study, we tried to examine which hemispheres are affected more during stroke and which underlying conditions cause this, in line with the data we have.

In CVD patients; Which hemisphere is affected also affects the patient's risk of disability in the long term. Precautions should be taken before the disease develops for stroke, which affects the individual and the national economy with its care and long-term treatment. For this, changeable risk factors should be focused on, problems such as lifestyle changes, access to healthy and natural food, and treatment of chronic diseases should be resolved.

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Case Report
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Posterior Reversible Encephalopathy Case In Emergency Department

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Abstract

Posterior reversible encephalopathy syndrome (PRES) is a clinical condition with neurological symptoms such as headache, seizure, nausea-vomiting, and visual impairment. The most common cause is hypertension. In magnetic resonance imaging (MRI), hyperintensity due to vasogenic edema is observed in the posterior cerebral areas. In this case, we aimed to present a PRES case with newly diagnosed hypertension.

Key words: Emergency service, intensive care, posterior reversible encephalopathy syndrome, vasogenic brain edema

Introduction

Posterior reversible encephalopathy syndrome (PRES) was first described in 1996 by Hinchey et al.[1]. According to this definition; Patients have imaging findings with edema in the posterior cerebral white matter accompanying symptoms such as headache, nausea, vomiting, altered state of consciousness, seizures, and visual impairment[1,2]. Clinical and imaging findings are generally reversible[3]. Occipital and parietal lobe involvement is frequently seen on imaging[4]. Its etiology includes hypertension, renal failure, eclampsia, vasculitis, use of immunosuppressive and immunomodulatory drugs, and chemotherapeutic drugs[3-5]. Treatment; It may be possible by eliminating the etiological cause[6]. Our aim in this case; To discuss the possibility of PRES in a patient who comes to the emergency department (ED) with various neurological symptoms in the light of the literature.

Case

A 28-year-old male patient was brought to the emergency room with complaints of seizure and loss of consciousness. The glasgow coma scale score of the patient was 13, and he was not stable and looked like toxic. The patient's relatives had a history of having a headache for 1 month. He was experienced syncope and had tonic clonic contractions for three minutes on the road today. The patient had no history of any illness, and he did not use any medication. On admission he had a blood pressure of 207/134 mmHG, pulse 145 / min, respiratory rate 34 / min, and fever 38.1 C in his vital signs. On physical examination, he was confused. Neurological examination revealed no lateralizes deficits. He had not neck stiffness and kerning brudznski signs were negative. Other systemic examinations did not reveal any pathology.

After inserting a bladder catheter was to the patient, macroscopic hematuria was observed. During the observation of the patient in the ED, he had another seizure; iv diazem stopped the seizure activity. In the laboratory findings of the patient, urea 128 mg / dL (18-55 mg / dL), creatinine 4.26 mg / dL (0.50-1.40 mg / dL), uric acid 16.5 mg / dL (35, -7.2 mg) / dL), white blood cell 17.4 10 ^ 9 / L (4-10.5 10 ^ 9 / L), hemoglobin 14.9g / dL (13.5-18 g / dL), platelet 310 10 ^ 9 / L (150-450 10 ^ 9 / L), blood gas ph 7.42 (7.35-7.45), PCO2 32mmhg (35-48mmhg), lactate 1.5mmol / L (0.9-1.7mmol / L) was seen. No acute pathology was found in the brain computed tomography (CT) of the patient in the ED.

The patient underwent lumbar puncture (LP) due to fever and mental status change. Protein, glucose and cell counts of the cerebrospinal fluid (CSF) were within the normal limits. The PCR examination of the viral panel was negative. The patient's urine was examined for the purpose of any drug or sustance misuse and no drug was detected.Hyperintensity in T2 AG and FLAIR sequences are observed in cortical-subcortical and periventricular areas in the right cerebellar hemisphere and both occipitoparietal regions In brain MRI. After ıv Gadolinium infusion, slightly expansile pathological signal changes with indistinct borders and no significant enhancement were observed (Figure 1).

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The patient was admitted to the emergency critical intensive care unit with the diagnosis of posterior reversible encephalopathy with current findings. Intravenous nicardipine infusion was initiated for blood pressure regulation and midazolam infusion for sedation.The patient was followed up with intravenous treatment for 3 days, and after blood pressure regulation was achieved, sedation was discontinued and oral antihypertensive treatment was started. In the renal ultrasonography performed during the intensive care follow-up, grade 2 increase in renal parenchyma was observed and 10 g proteinuria was detected in 24-hour urine. Control brain MRI lesions taken during follow-up were observed to regress (Picture 2). During the intensive care follow-up, the patient who did not have any seizures and blood pressure was regulated. The patient was transferred to the nephrology clinic for evaluation nephropathies.

Discussion

PRES as a clinical and radiological syndrome is first described by, Hinchey et al in 1996. The pathophysiology of the diesease is not fully understood. The diesease is characterized with focal neurological symptoms such as headache, nausea, vomiting, confusion, seizures, and visual impairment[5]. Our patient is also admitted to headache, seizure and confusion.

Hypertension is The most common cause of PRES[2]. Autoimmune diseases, kidney failure, immunosuppressive treatments, electrolyte disturbances, sepsis, and pregnancy may also cause PRES[2]. Although our patient had no hypertension in his past medical history, his blood pressure values were measured high.

Imaging is essential in diagnosis. Computed tomography of the brain often detects neuroradiographic anomalies, but the best imaging method is magnetic resonance imaging (MRI). On MRI, hyperintensity in T2W and flair sequences, characterized by bilateral, asymmetric, vasogenic edema, typically involving the posterior cerebral hemisphere, especially parietooccipital area, are observed[6]. The lesions are rarely seen in the cerebellum, thalamus, brain stem and spinal cord[6,9]. In our case, lesions were observed in the right cerebellum and parietooccipital region.

The most widely accepted theory in pathophysiology is central hyperperfusion. In normal cerebral vascular autoregulation, arterioles respond to vasoconstriction, dilatation, and vasoactive substances (such as nitric oxide, thrombox-

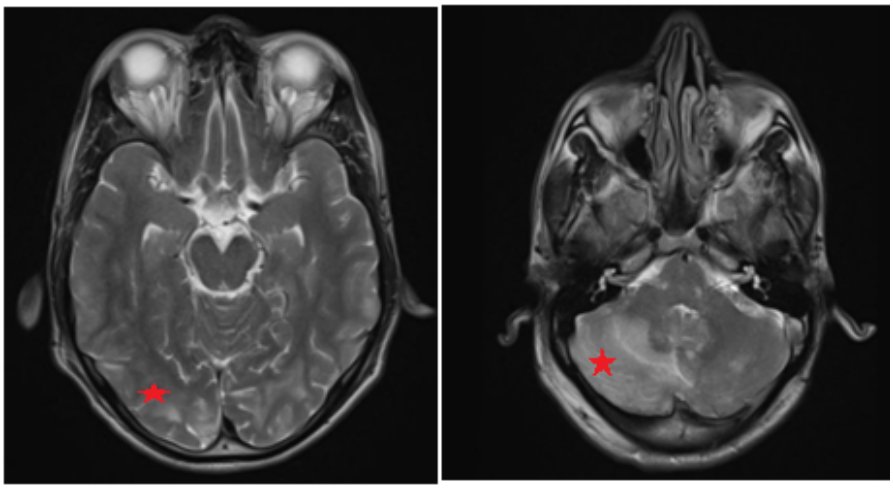

Figure 1: Hyperintensity in T2 Flair sequence on brain MRI.

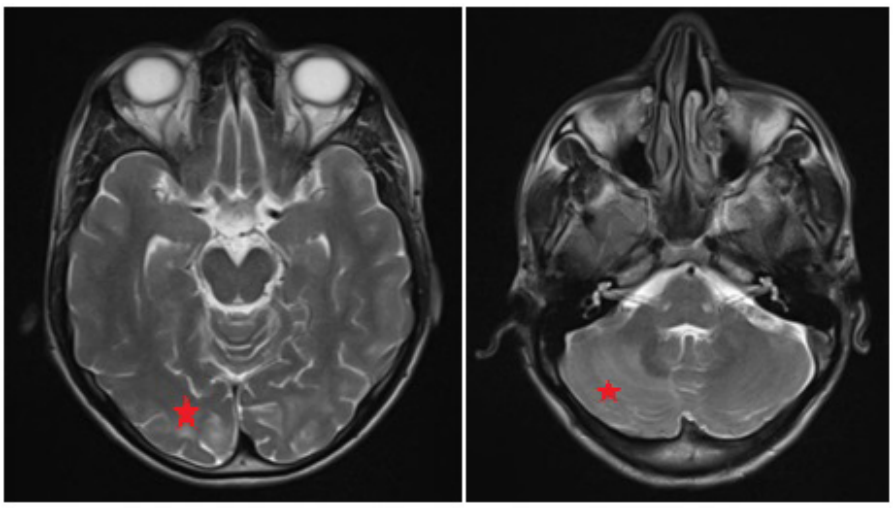

Figure 2: Reduced hyperintensity in the T2 Flair sequence in brain MRI compared to figure 1.

ane A2, endothelin-1) secreted from the endothelium against systemic blood pressure changes[6]. Therefore, some literature suggest that hypertension alone is not a sufficient reason for PRES[6-8]. Sudden blood pressure changes or direct damage of cytotoxic agents to the endothelium cause blood-brain barrier disruption, vascular leakage and brain edema[6]. In our case, the patient's initial blood pressure values were 207 / 134mmHg in our ED.

Angiographic studies revealed that while hypertensive crisis occur in pres, posterior system arteries became vasospastic[9]. In many studies, fibrinoid necrosis, interstitial edema and petechial microhemorrhages were observed in the arteriole walls, but no infarction finding was found [9,10]. sudden changes in blood pressure is accepted to be responsible for the pathogenesis of this syndrome, the there are some cases reported without severe hypertension[10].

PRES lesions are mostly located in parietooccipital area (70%) fed by the posterior cerebral circulation[4,6]. İnvolvement of the cerebellum, brainstem, basal ganglia, thalamus, spinal cord, and corpus callosum has also rarely reported. In our case, hyperintense lesions were observed bilaterally in the parietooccipital and right cerebellum.

Imaging and clinical signs are not specific for PRES diagnosis.

The diagnosis is made by excluding possible etiologies and evaluating risk factors (hypertension, renal insufficiency, immunosuppressor therapy ... etc)[5].

The possible etiologies in the differential diagnosis list of PRES may listed as bilateral posterior lobe infarctions, cerebral venous thrombosis, herpes virus and other encephalitis, cerebral vasculitic involvement, mitochondrial encephalopathy, hypertensive encephalopathy, hypoglycemia, and hyponatremia[2].

These diagnoses were also considered in the differential diagnosis list in our patient, and this work-up was made by the help of neurological examination, laboratory tests, central imaging (BBT and MRI) and LP.

The patient was diagnosed with PRES because the MRI examination of the patient had typical features for PRES.

Quick diagnosis and prompt treatment are very important in evaluation of PRES. Symptoms are often reversible. Correcting the underlying cause of the disease is the mainstay of the teratment. Regardless of the etiology, hypertension occurs in the majority of cases, and blood pressure regulation allows the patient to recover dramatically. The use of easily titrated parenteral antihypertensives such as nicardipine and labetol is recommended in the treatment[5]. Seizures are frequently observed in PRES patients. The choice of anticonvulsant agent should be made, taking into account the patient's kidney functions, the need for sedation and his/her accompanying diseases[5]. In our patient, nicardipine was used for blood pressure regulation and midazolom was used as an anticonvulsant and sedative. It has been reported that clinical and radiological findings usually disappear between 1 and 4 weeks in PRES[10]. In our patient, after blood pressure regulation was achieved, the symptoms has resolved and hyperintense images decreased in the MRI investigation one week later.

Conclusion

PRES should be considered in the differential diagnosis of hypertensive patients presenting with acute neurological deficits in the ED. Early diagnosis and treatment is crucial and the recovery of patients without sequelae depends on this approach.

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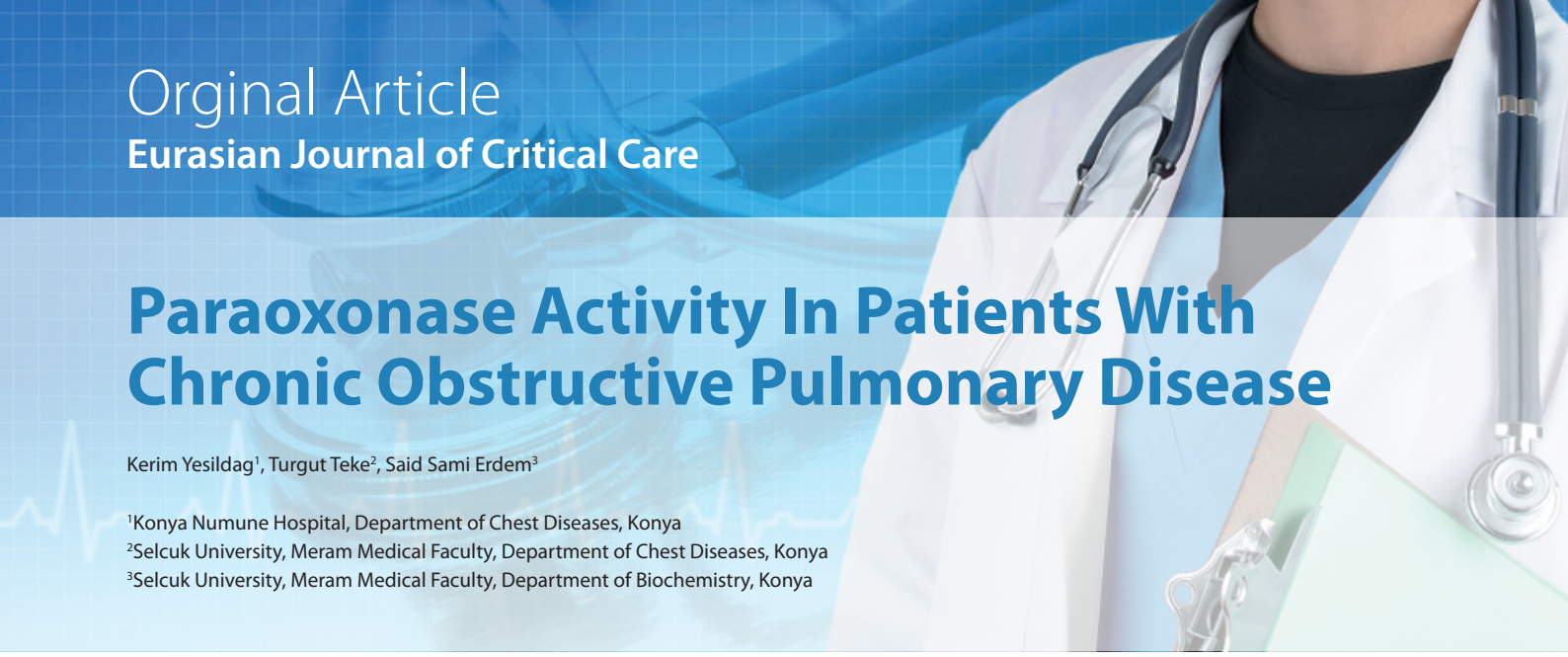

Paraoxonase Activity In Patients With Chronic Obstructive Pulmonary Disease

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Abstract

Aim: We aimed to study the Paraoxonase 1 (PON1) activity in chronic obstructive pulmonary disease (COPD) patients with stable condition, had acute attack and developed respiratory failure.

Material and Method: Twenty-five patients with stable COPD (group1) (mean age 62.9±9.4), 25 cases with acute COPD attack (group2) (mean age 63.8±9.0), 25 patients with hypercapnic respiratory failure (group3) (mean age 65.0±12.9) and 25 healthy individuals for control group (mean age 34.8±9.8), totally 100 cases, were enrolled to the study. Cases with secondary lipid disorder, cardiovascular disease, diabetes mellitus, renal failure, malignancy, hepatic failure and patients who receive antilipidemic or antioxidant medicines were not included to the study. All cases enrolled to the study underwent routine biochemical analysis including PON1 activity and lipid profile.

Results: There was significant difference between groups with respect to PON1 levels ($p<0.0001$). PON1 activities of COPD patient groups (group 1=96.8±57.4U/L; group 2=51.4±32.8U/L; group 3=47.1±27.5U/L) were lower than control group (185.4±110.1U/L) ($p<0.0001$). Also, PON1 activity of stable COPD patients was higher than the COPD cases admitted with acute attack or respiratory failure (group2 and 3) ($p<0.05$).

Conclusion: These findings show that PON1 activity may have a role in COPD pathogenesis and endogen antioxidants might be depleted by increased oxidative stress in COPD. This also advocates that oxidative stress may have a role in acute COPD attacks.

Key words: COPD, oxidative stress, Paraoxonase

Introduction

The demonstration of poorly reversible airflow limitation, defined as a post-bronchodilator FEV1/FVC ,0.7 are needed the diagnosis of chronic obstructive pulmonary disease (COPD)[1]. Oxidant / antioxidant imbalance is a major problem in COPD. This imbalance causes protease / antiprotease imbalance, destruction and restructuring of parenchyma, excessive mucus secretion, change in mucus structure, increase in apoptosis, and narrowing of bronchi, which are important components of COPD pathogenesis. All these changes are also effective in COPD progression. Increased oxidative stress in COPD is not only associated with an increase in oxidants but also with a decrease in antioxidant capacity[2].

The organism gets support from endogenous antioxidant enzymes (such as superoxide dismutase, glutathione peroxidase, catalase) to protect itself against oxidant stress. Serum paraoxonase (*PON1*) is a lipophilic endogenous antioxidant enzyme synthesized in the liver and circulates with HDL in serum. *PON1* activity is protective against xenobiotic toxicity such as organophosphate. PON1 inhibits LDL oxidation and shows antiatherogenic properties as it reduces oxidative stress in atherogenic lesions. Therefore, *PON1* works as an endogenous free radical scavenger in the human body[3,4].

Changes in *PON1* activity have been reported in different diseases in which oxidative stress plays a role in the pathogenesis. Some of them are cardiovascular diseases, neurological diseases, gastrointestinal system diseases, chronic renal failure, chronic liver failure, diabetes mellitus and metabolic syndrome, different types of cancer, rheumatological diseases, pulmonary tuberculosis, asthma[4,5].

PON1 is localized in Clara cells, endothelial cells and type 1 pneumocytes in the lung. Clara cell is one of the cells most resistant to oxidants in airway cells. There is a decrease in clara cells in COPD patients and smokers[6].

It was aimed to investigate the serum *PON1* activity in patients with stable, acute and hypercapnic respiratory failure COPD and to compare it with the healthy control group in the current study.

Materials and Methods

In this case-control study, 75 patients diagnosed with COPD according to The Global Initiative for Chronic Obstructive Lung Disease (GOLD) and 25 healthy people who did not have COPD or any other disease and who did not smoke were included as the control group.

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Table 1. Demographic features. pulmonary function tests (PFT) and arterial blood gas (ABG) values of the patients

	Stable COPD group (Mean.±SD)	COPD Exacerbation Group (Mean.±SD)	Respiratory Failure Group (Mean.±SD)
Age(years)	62.9±9.4	63.8±9.0	65.0±12.9
Disease Duration (years)	8.2±5.9	10.4±6.2	11.4±8.0
Cigarette pack (year)	49.8±26.7	44.6±24.3	61.6±30.0
Pulmonary Function Tests			
FEV1 (lt)	1.89±0.71	1.42±0.80	1.27±0.59
FEV1(%)	64.2±20.4	50.2±20.9	44.2±17.5
FVC(%)	87.2±18.3	70.5±19.2	61.4±15.7
FEV1/FVC	56.3±11.5	54.0±11.8	53.7±11.5
Arterial Blood Gas			
pH	7.42±0.03	7.43±0.05	7.29±0.07
pCO2(mmHg)	35.6±7.3	40.5±7.4	71.3±20.0
pO2(mmHg)	64.5±12.4	64.3±16.3	63.9±18.3
HCO3(mEq/L)	23.0±4.3	26.3±3.7	32.0±7.7
sO2(%)	91.3±5.7	91.7±5.0	86.0±8.9

FEV1: Forced expiratory volume in 1st second **FVC:** Forced vital capacity **SD:** Standard Deviation

Patients are divided into 3 groups as follows.

Stable COPD group; 25 outpatient clinic control cases with stable COPD

Acute COPD attack group; 25 patients hospitalized with COPD attack

Hypercapnic respiratory failure group; 25 patients hospitalized in intensive care due to hypercapnic respiratory failure depend on COPD

Exclusion Criteria: Secondary lipid disorder, Coronary artery disease, Diabetes mellitus, Kidney failure, Malignancy, Liver failure, Antilipidemic and antioxidant drug use.

The protocol and procedures of this study were approved by the Local Ethics Committee of Selcuk University Meram Faculty of Medicine. Informed consent was obtained from all individuals included in the study.

Demographic characteristics, pulmonary function tests (PFT) and arterial blood gas (ABG) values of the patients included in the study were recorded. Serum samples obtained from the patients included in the study and the control group to measure *PON1* activity were placed in the eppendorf and stored at -80 ^{0}C degrees until the study. In addition, routine biochemical examinations including lipid profile were performed in all 100 people included in the study a (COBAS Integra 800 automatic analyzer (Roche, Switzerland)).

Statistical analysis

SPSS version 23 (Statistical Package for Social Sciences) was used for statistical analysis. In addition to descriptive statistics (number, mean, standard deviation), Kruskall–Wallis test for the comparison of all groups were used. Also, and Mann–Whitney U test for pairwise comparison of groups was carried out. The $p < 0.05$ was accepted as statistically significant.

Table 2. Comparison of PON1 and Lipid Levels in the control and patient groups

	Control (Mean.±SD)	Stable COPD group (Mean.±SD)	COPD Exacerbation Group (Mean.±SD)	Respiratory Failure Group (Mean.±SD)
HDL(mg/dL)	38.7±15.9	35.5±16.6	40.8±17.7	43.7±21.6
LDL(mg/dL)	98.4±28.3	100.2±34.1	96.6±29.0	99.1±32.5
VLDL(mg/dL)	20.8±8.9	22.4±9.3	17.0±8.2	19.4±9.5
Total Cholesterol (mg/dL)	157.6±31.7	158.2±44.6	154.4±34.4	163.0±37.0
Triglyceride (mg/dL)	79.4±38.7	82.5±41.4	85.1±40.7	97.4±45.6
PON1(U/L)	185.4±110	96.8±57.4*	51.4±32.8**	47.1±27.5**

HDL: High-Density Lipoprotein **LDL:** low-density lipoprotein **VLDL:** Very-low-density lipoprotein **PON1:** Paraoxonase 1 **SD:** Standard Deviation

*p<0.001: Compared to the control group **p<0.0001: Compared to the control group

Table 3. Comparison of demographic characteristics and PON1 activities of stable and attacked patients

	STABLE (n=25) (Mean.±SD)	**ATTACK** (n=50) (Mean.±SD)	p
Age(years)	62.9±9.4	64.4±11.1	0.677
Disease Duration (years)	8.2±5.9	10.9±7.1	0.048
Cigarette pack (year)	49.8±26.7	53.1±28.3	0.565
pO2(mmHg)	64.5±12.4	64.1±17.1	0.657
sO2(%)	91.3±5.7	88.9±7.7	0.192
FEV1(%)	64.2±20.4	47.6±19.5	0.002
FEV1/FVC	56.3±11.5	53.9±11.6	0.345
PON1(U/L)	76.8±57.4	49.3±30.1	0.025

FEV1: Forced expiratory volume in 1st second **FVC:** Forced vital capacity **PON1:**Paraoxonase 1 **SD:** Standard Deviation

Results

The mean age of patients was 62.9±9.4 for stable COPD group, 63.8±9.0 for acute COPD attack group and 65.0±12.9 for hypercapnic respiratory failure group. The mean age of control group was 34.8±9.8.

The mean durations of illness (years) were 8.2±5.9 for stable COPD group, 10.4±6.2 for acute COPD attack group and 11.4±8.0 for hypercapnic respiratory failure group. Additionally, the use of mean cigarette-pack (years) was 49.8±26.7 for stable COPD group, 44.6±24.3 for acute COPD attack group and 61.6±30.0 for hypercapnic respiratory failure group. Demographic characteristics, pulmonary function tests (PFT) and arterial blood gas (ABG) values of the patients included in the study were given in the table 1.

When *PON1* and Lipid Levels were compared in the control and patient groups, statistically significant differences were found between the control (185.4±110) and stable COPD group (96.8±57.4), the control (185.4±110) and acute COPD attack group (51.4±32.8) and the control (185.4±110) and hypercapnic respiratory failure group (47.1±27.5) ($p<0.001$, $p<0.0001$ and $p<0.0001$), respectively. When the

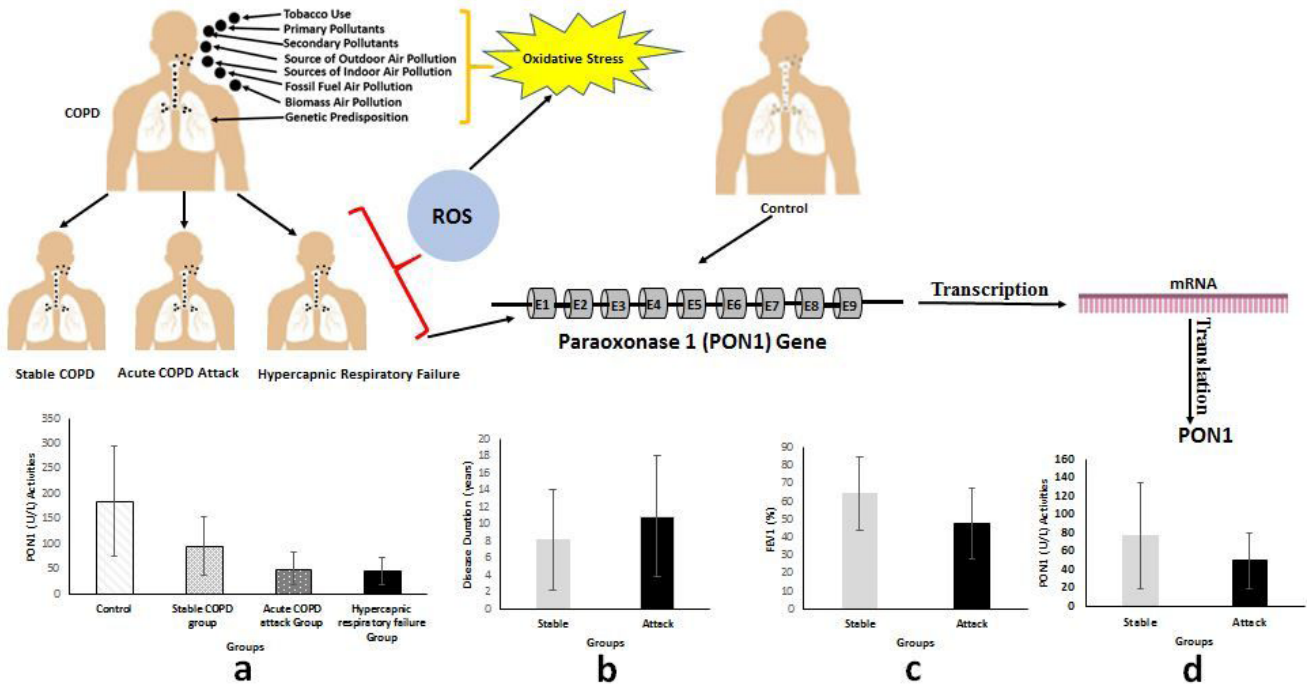

Figure -1. Risk factors for COPD (Tobacco Use, Primary Pollutants, Secondary Pollutants, Source of Outdoor Air Pollution, Sources of Indoor Air Pollution, Fossil Fuel Air Pollution, Biomass Air Pollution, Genetic Predisposition). Patients are divided into 3 groups as follows.
Stable COPD group, COPD exacerbation group and Respiratory failure group. Paraoxonase activities in patients with COPD and control groups were measured. Statistically significant differences were detected among all groups for PON1 activities (**a**). Additionally, statistically significant differences between stable and attack groups were detected for disease duration (**b**), FEV1 (**c**) and PON1 activities (**d**).

lipid levels to be considered, no statistically significant differences were found between the control and any of patient groups (p>0.05) table 2.

When the demographic characteristics of stable and attack patients and *PON1* activities were compared, the statistically significant differences were found for the duration of illness (year) (p = 0.048), forced expiratory volume in 1st second (fev1) (p = 0.02) and *PON1* (U / L) (p = 0.001) levels table 3.

Risk factors for COPD (Tobacco Use, Primary Pollutants, Secondary Pollutants, Source of Outdoor Air Pollution, Sources of Indoor Air Pollution, Fossil Fuel Air Pollution, Biomass Air Pollution, Genetic Predisposition) were shown in figure 1. Patients are divided into 3 groups as follows; Stable COPD group, acute COPD group and Hypercapnic respiratory failure group. Paraoxonase activities in patients with COPD and control groups were measured. Statistically significant differences were detected among all groups for *PON1* activities (**a**). Additionally, statistically significant differences between stable and attack groups were detected for disease duration (**b**), FEV1 (**c**) and *PON1* activities (**d**) (figure 1).

Discussion

It was suggested that the atherogenesis risk increase due to increasing the oxidized HDL particles caused by reduced *PON1* activity may not protect LDL against oxidation[7,8]. Moreover, *PON1* polymorphism and its' decreased activity have been related with several neurological diseases, including amyotrophic lateral sclerosis (ALS), ischemic stroke, white matter lesions, Parkinson's disease, and dementia[9-11]. In some study it was announced that *PON1* was lower in patients with COPD than controls[12,13]. In another study, it was reported that RR phenotype of *PON1* was more common in COPD patients compared to control. COPD patients exhibited higher *PON1* activity compared to control[5].

The current study showed that serum *PON1* activity was significantly lower in COPD patients compared to healthy people. This situation supports that the decrease in antioxidant capacity also has an effect on oxidant / antioxidant imbalance in COPD. These results suggest that changes in *PON1* activity may also play a role in the pathogenesis of COPD. In this study, it was also shown that serum *PON1* activity was significantly lower in patients with exacerbated COPD than in patients with stable COPD.

No differences of lipid parameters (HDL, LDL, triglycerides, total cholesterol) between the phenotype subgroups *PON1* gene were detected[5]. While the relation between lipid parameters and *PON1* activity was reported in some study[14], conversely, other studies showed no relation between *PON1* activity and lipid parameters[15,16]. According to our results, when the lipid levels to be considered, statistically significant differences were not found between the control and any of patient groups.

The relationship between COPD and cigarette smoke is well known. In some studies, it was reported that PON1 activity was reduced by cigarette smoke[17-19]. Conversely it was reported that *PON1* activity in smokers did not show differences from that of nonsmokers[20].

According to our results, the use of mean cigarette-pack (years) from highest to lowest was acute COPD exacerbation group, stable COPD group and hypercapnic respiratory failure group respectively. The lack of statistically significant differences between the stable and attack patient groups in terms of smoking suggest that the decrease in *PON1* activity of patients with attacks is independent from smoking. This situation supports that oxidative stress also plays a role in COPD exacerbations.

As a result, there was significant difference between groups with respect to *PON1* levels. *PON1* activities of COPD patient groups were statistically lower than control group. Also *PON1* activity of stable COPD patients was higher than the COPD cases admitted with acute attack or respiratory failure (group2 and 3). Our findings show that *PON1* activity may have a role in COPD pathogenesis. Additionally, endogen antioxidants might be depleted by increased oxidative stress in COPD. This also advocates that oxidative stress may have a role in acute COPD attacks.

However, in order to verify these relationships between *PON1* activity and COPD, more large prospective studies composed of high number of patients, in which healthy smokers as a control group are included and comparisons are made according to the GOLD staging are needed.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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Case Report
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Covid-19 Pandemic, Restrictions and Rhabdomyolysis

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Abstract

Rhabdomyolysis is a syndrome that occurs as a result of the destruction of muscle cells and intracellular materials are added to the systemic circulation. Clinical and laboratory findings and complications arise as a result of the destruction of muscle cells. In our case, a 19-year-old male patient was admitted to the emergency department with bilateral widespread leg pain and inability to walk, especially in the right leg. Within the scope of the quarantine applied during the Covid-19 epidemic, the patient remained without leaving home for a few months. On the day she went out, her complaints started despite only walking around for a while and not doing any heavy exercise. The patient was followed up and treated with the diagnosis of rhabdomyolysis since the creatinine kinase (CK) level was found to be significantly higher in the laboratory tests of the patient. This case is presented to us to draw attention to the fact that secondary results of pandemics can occur in different situations and that rhabdomyolysis can be treated without early diagnosis and complications. Not leaving the house during the pandemic process should not lead to an excessively sedate life. It is important to overcome the pandemic period without encountering disorders such as rhabdomyolysis and thromboembolism.

Key words: Rhabdomyolysis, COVİD-19, Pandemic

Introduction

Rhabdomyolysis is a clinical syndrome that develops when intracellular materials enter the systemic circulation as a result of the destruction of muscle cells. Excessive, uncontrolled, and sudden exercise by an untrained person can cause rhabdomyolysis. The incidence of exercise-induced rhabdomyolysis is difficult to define because many patients likely do not seek medical attention. In a study conducted on soldiers, its incidence was found to be 0.2%[1]. Clinically, the characteristic triad consists of muscle pain, weakness, and dark urine. If not diagnosed and treated, life-threatening conditions such as renal failure, compartment syndrome, cardiac arrhythmia, hypovolemic shock may occur. There is no exact pathological level of creatine phosphokinase (CPK) for the diagnosis of rhabdomyolysis. Generally, an increase of 10 times the normal range is considered significant[2]. Creatine phosphokinase elevation after the intense activity is a quite common phenomenon. The SARS-Cov2 virus, which causes Covid-19, spread rapidly among people through droplets, causing a pandemic all over the world[3]. Country administrators initiated a curfew to reduce the spread of the epidemic, covering people over 65 and children and young people under 20. Calls to "stay at home" made all over the world suddenly caused life to slow down and daily physical activities to be minimized. The first intense activity after a hypoactive process may result in rhabdomyolysis. Life-threatening rhabdomyolysis by causing systemic complications can occur during the fight against COVID-19. Our aim is to reveal the secondary harms of the COVID-19 pandemic and to ensure that the necessary measures are discussed in a multifaceted way.

Case

A 19-year-old male patient was admitted to the emergency room with a complaint of widespread pain and weakness in both legs for two days. According to the anamnesis taken, our patient did not leave the house for fifteen days following the calls of "stay at home" due to the COVID-19 pandemic. Two days ago, after going out for shopping and walking for a while, he was unable to walk due to increasing muscle pain and applied to the emergency room. Vital signs of body temperature: 36.7 ºC, respiratory rate: 18 / min. pulse: 120/ min. blood pressure: 140/90 mmHg, blood sugar: 126, SO_2: 97 In the physical examination, it was observed that the patient had difficulty walking. In his neurological examination, he was consciously oriented, cooperated cranial nerves were intact and there was no neck stiffness. On upper extremity muscle strength examination, deltoids 4/5, biceps, triceps 3/5, lower extremity hip flexion left 3/5, right 4/5 knee and foot dorsiflexion was detected. Other systemic examinations

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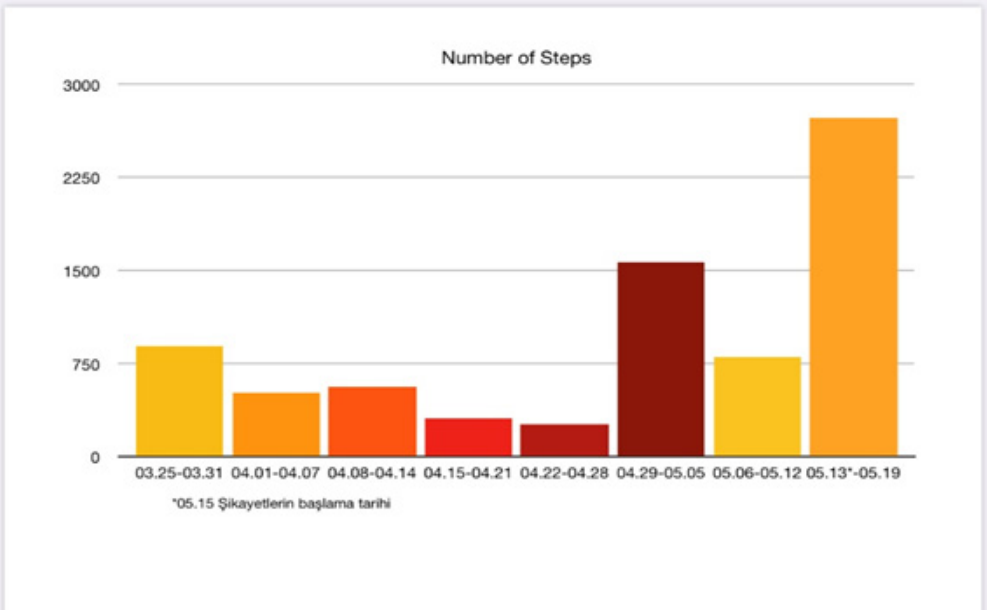

Figure 1. Average number of steps per weeks

were evaluated as normal. The patient had no known chronic illness or regular medication.

In laboratory tests; hemoglobin: 17.30 / g, white blood cells: 8.220 / mm3, neutrophil: 49.38%, C-reactive protein: 2.02 mg / dL, blood glucose: 126 mg / dL, creatinine; 0.70, aspartate aminotransferase: 43 U / L, alanine aminotransferase: 89 U / L, CPK: 713 U / L. When the CPK level was found to be high in the patient, three positive (+++) hemoglobin and 35 erythrocytes were found in the complete urinalysis. It was found that the patient's clinical complaints started when he moved after being inactive for a long time during the pandemic period (Figure 1). It was thought that all these symptoms may be due to rhabdomyolysis. An additional neurological disease was not considered in the patient, who was also evaluated by neurology. The patient's COVID-19 PCR test result was found to be negative. CPK levels in control blood tests were determined as 2289 U / L, 3171 U / L, 2216 U / L, 1631 U / L and 383 U / L (Figure 2). The patient's muscle pain was relieved after fluid therapy, and the bilateral lower and upper extremity muscle strength was intact in the last neurological examination. After 3 days of clinical follow-up in the emergency service, the patient was discharged with recommendations, whose blood values and clinic improved.

Discussion

Due to the COVID-19 pandemic, the importance of masks, hygiene, social distance, and isolation rules are indisputable in breaking the chain all over the world. The most notable

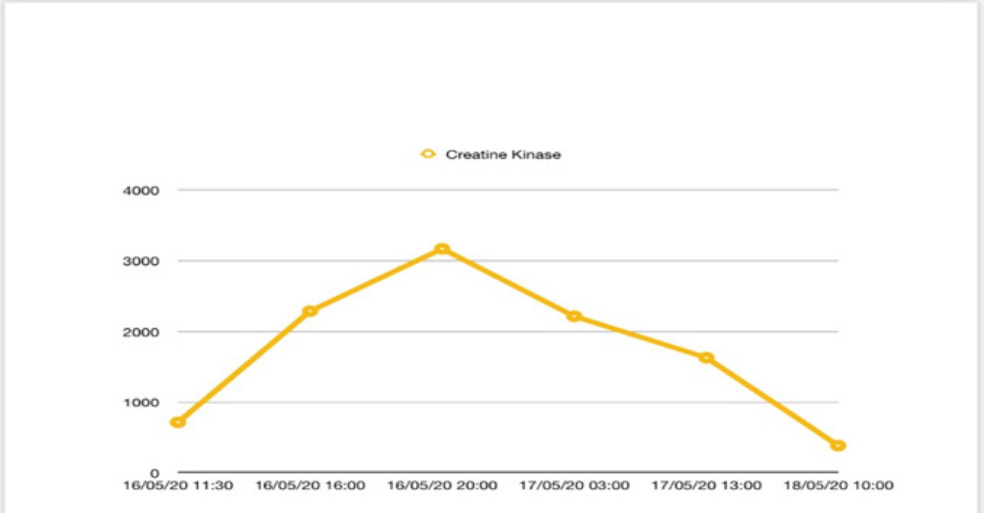

Figure 2. Creatinine kinase levels during treatment

step taken to prevent droplet transmission has been called for 'stay at home'. Thus, it was aimed that fewer people may be sick at the same time period at the social level. With the practice of "stay at home", the mobility in cities has decreased by 30-40% and it has been observed that people do not leave small living areas[4] Rhabdomyolysis, which is clinically characterized by muscle pain, weakness, and dark urine, can lead to fatal complications such as renal failure, compartment syndrome, and dysrhythmia[5,6]. Therefore, it is necessary not to waste much time during the diagnosis phase. Serum creatine phosphokinase increase is a possible result after strenuous activity[7]. Therefore, the distinction between a physiologically normal condition and a disease should be made well. Physical activities that occur after being immobilized at home for a long time due to pandemic result in rhabdomyolysis, creating a security vulnerability for our health. (a lack of trust for our health) This situation has shown that the secondary results of the pandemic may appear in different situations. Young men with more muscle mass should be more careful about this. When the daily step number program on smartphones is examined, rhabdomyolysis occurs on the day when the number of steps is suddenly increased during the curfew and the period when schools are closed (Figure 2).

People should be informed that they do not spend the days they stay at home by being sedentary and to make appropriate exercise programs for them. We should change the concept of "stay at home" that entered our lives with COVID-19 as "stay and move at home" and learn to live with the reality of COVID-19. Not leaving the house during the pandemic process should not lead to an excessively sedate life. It is important to overcome the pandemic period without encountering disorders such as rhabdomyolysis and thromboembolism.

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Orginal Article
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Retrospective Evaluation of Patients Admitted to the Emergency Department with Acute Ischemic Stroke; Analysis of 50 Cases

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Abstract

Aim: The aim of this study is to contribute to the literature by investigating the relationship of the data obtained from the patients presented to our emergency service with acute ischemic stroke with the prognosis of patients.

Materials and methods: The study was conducted over the files of all patients applied to emergency service and obtained acute ischemic stroke (AIS) diagnosis between 01.01.2019-31.12.2019. All patients over 18 with accessible data and diagnosed with AIS were included in the study. Patients without of AIS type, and younger than 18, or without accessible data were excluded.

Results: A total of 50 patients were included in the study. The average age of the patients was 69.74±11.72. Among the patients, 20 (40%) were female. The analysis of application complaints of the cases revealed that 30 (60%) patients had loss of power in extremities. The leading medical history of patients were smoking 35 (70%) and hypertension 34 (68%). The laboratory results of the cases revealed the CRP as 22.11±37.45 mg/L and neutrophil lymphocyte ratio (NLR) as 3.05±1.93. According to Modified Rankin Scale (MRS), 30 (60%) of the cases had a score equal and lower than 2, and 20 (40%) of them had a score of 3 or higher. NLR was statistical significance at differentiating between dependent and independent patients groups according to MRS.

Conclusion: Although there are studies suggesting the use of NLR as a prognosis marker in AIS, for the generalization of these data they should be supported with many further randomized and controlled studies.

Key words: Emergency service, acute ischemic stroke, modified rankin score, neutrophil-lymphocyte ratio, prognosis

Introduction

The leading reasons of death are circulatory system related disorders according to 2019 data of the Turkish Statistical Institute[1]. Deaths caused by circulatory system related disorders were determined to be due to ischemic heart disorder (39.1%), cerebrovascular diseases (22.2%), and other cardiac diseases[1].

Cerebrovascular diseases (CVD), which are among the uppermost causes in terms of mortality and morbidity in Turkey as well as worldwide, were defined as "Temporary or permanent condition of a brain area due to ischemia or hemorrhage, and/or primary pathological damage of one or more arteries of the brain" by National Institute of Neurological Disorders and Stroke (NINDS)[2].

World Health Organization has defined the stroke syndrome, which is commonly confronted as CVD in emergency service as "Symptoms related with focal or global dysfunction of cerebral functions which are rapid, persisting for 24 or more hours, or resulting in death"[3]. These stroke cases are 80-85% ischemic origin and 15-20% hemorrhagic origin[3,4].

Even though the mortality and morbidity rates of high, number of studies investigating the relation of clinical symptoms of acute ischemic stroke patient detected in the emergency services and prognosis of these patients are quite limited. In this study, we aimed to determine the efficiency of symptoms of acute ischemic stroke patients applied to our emergency service in terms of determining the prognosis of the patients.

Materials and methods

The required ethics council approval was obtained prior to this retrospective study from Ethical Council of Faculty of Medicine, Namık Kemal University (30.03.2021/202178.03.18). The study was conducted over the files of patients who have applied to a tertiary health care emergency service and obtained acute ischemic stroke diagnosis between 01.01.2019-31.12.2019. All patients over 18 with accessible data and diagnosed with acute ischemic stroke were included in the study. Patients without CVD of acute ischemic type, and younger than 18, or without accessible data were excluded. In order to gather the standard patient data, a case report form was prepared. This form include age, sex, smoking status, complaints, hemogram values, liver function tests, other diseases such as hypertension (HT), diabetes mellitus (DM), coronary artery disease (CAD), chronic obstructive

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Table 1. Demographic and clinical characteristics of the cases

	n(%) Mean ± std
Age	69,74 ± 11,72
Gender	
Female	20(%40)
Male	30(%60)
Smoking	35(%70)
Chronic diseases	
HT	34(%68)
DM	17(%34)
CAD	4(%8)
COPD	18(%36)
CHF	2(%4)
MRS	
3≤	20(%40)
2≥	30(%60)
Outcome	
Hospitalization (NICU)	47(%94)
Hospitalization (ICU)	3(%6)

HT: Hypertension, **DM:** Diabetes mellitus, **CAD:** Coronary artery disease, **COPD:** Chronic obstructive pulmonary disease, **CHF:** Congestive heart failure, **MRS:** Modified Rankin Scale, **std:** standard deviation, **NICU:** non intensive care unit, **ICU:** intensive care unit

Table 2. Complaints of the cases applying to the emergency department

	n(%)
Loss of strength on the right side of the body	13(%26)
Loss of strength on the left side of the body	17(%34)
Speech disorder	19(%38)
Dizziness	3(%6)
Other*	9(%18)

*: numbness in the extremities, numbness of the tongue, slipping of the lips, fainting, confusion, sudden forgetfulness

Table 3. Laboratory findings of the cases

	Mean±Std	Cut-off range
NLR	3,05±1,93	None
CRP mg/L	22,11±37,45	0 - 5
WBC 10^3/uL	8,27±2,68	4 - 10,5
Neutrophil 10^3/uL	5,37±2,35	1,5 - 6,6
Lymphocyte 10^3/uL	2,03±0,74	1,5 - 3,5
Platelet 10^3/uL	235,7±68,5	132 - 356
ALT IU/L	21±17	0 - 41
AST IU/L	26±21	0 - 40
GGT IU/L	37±34	0 - 60
ALP IU/L	65±24	40 - 129
LDH IU/L	211±71	135 - 225

NLR: Neutrophil/lymphocyte ratio, WBC: white blood cell, std: standard deviation

pulmonary disease (COPD), congestive heart failure (CHF); scan images, and Modified Rankin Scores (MRS). All data were obtained from patients files. All laboratory results were selected from the first results obtained at the time of patients' application to emergency service. Physical exam results were recorded individually for each patient. Later the results were categorized as right paraparesis/plegia, left paraparesis/plegia, dysarthria, dizziness, and other depending on the frequency. Cases were classified as dependent (MRS ≥ 3) and independent (MRS ≤ 2) depending on the MRS system. Power of the study was confirmed to be over 80% by the power analysis of the sample size.

Statistical method

The data were analyzed using the database prepared in SPSS 22.0 package program. Chi-square test, Fischer's exact test and independent t tests were used for analysis. $P < 0.05$ was accepted as statistically significant. For the categorical variables, descriptive statistics were expressed with number (n) and percentage (%); while continuous variables were expressed as median and standard deviation. In order to compare the data among the groups Chi-square test was used. The normality of the distributions of continuous variables was evaluated using Kolmogorov-Smirnov test. For the comparison of groups Mann Whitney U-test was used.

Results

For this study 75682 patient files were examined. A total of 242 patients with CVD in ICD code were further selected for advanced analysis. After evaluation by including and excluding criteria, 50 patients were included in the study.

The average age of the patients in the study was 69.74±11.72. Among the patients, 20 (40%) were female and 30 (60%) were male. The leading medical history of patients were smoking in 35 patients (70%) and hypertension (HT) in 34 patients (68%), CAD in 18 (36%), DM in 17 (34%), COPD in 4 (8%), and CHF in 2 (4%) (Table 1).

The analysis of application complaints of the cases revealed that 13 patients (26%) had loss of power in the right side of the body, 17 (34%) had loss of power in the left side of the body, 19 (38%) had dysarthria and 3 (6%) had dizziness. A total of 9 patients (18%) were experiencing other symptoms (paresthaesia in extremities, paresthaesia in tongue, shift in lips, fainting, brain fog, sudden dysmnesia) (Table 2).

The lab result analysis revealed the CRP values to be 22.11 ± 37.45 mg/L, WBC 8.27 ± 2.68 10^3/uL, neutrophil value 5.37 ± 2.35 10^3/uL, and lymphocyte value to be 2.03

Table 4. Olguların MRS'ye göre bağımlılık durumunun diğer parametreler ile karşılaştırılması

	MRS≤2	MRS≤2	p
NLR	3,46±2,13	2,38 ± 0,75	0,04
Hospitalization (NICU)	28	19	0,6
Hospitalization (ICU)	1	2	0,8
CRP mg/L	32,27 ±53,19	15,46± 2,49	0,2
Age	70,25 ±10,91	69,40 ±12,4	0,8

MRS: Modified Rankin Scale, **NICU:** non intensive care unit, **ICU:** intensive care unit, **NLR:** Nötrofil/ lenfosit oranı, **CRP:** C-reactive protein

± 0.7 10^3/uL. Neutrophil/Lymphocyte ratio (NLR) was 3.05 ± 1.93. Other laboratory results of the cases are given in Table 3.

Among the cases, three were taken into intensive care unit for advanced treatment, while 47 were hospitalized in the service. Although all the three patients taken into ICU were males, no statistically significant correlation between sex and hospitalization was detected (P= 0.2).

Moreover, no statistically significant correlation between comorbid disease history and hospitalization was detected (P= 0.55).

According to MRS, 30 (60%) of our cases had a score of 2 and lower, and 20 (40%) had 3 or more. Cases' dependent or independent status was determined not to be significantly affected from hospitalization condition selected for follow-up and treatment (P= 0.2). Similarly, the comparison of MRS and ages of the patients showed that there was no significant relationship (P= 0.8). The NLR was found to be significant in differentiating cases as dependent and independent (P= 0.04) (Tablo 4). The cut-off value was found to be 2.85 at the likelihood ratio of 3. NLR was detected to differentiate the cases as dependent and independent with a 55% sensitivity and 78% specificity (AUC: 0.65, 95% CI: 0.48-0.86).

Discussion

Stroke is one of the most common neurological diseases we come across in the emergency services, and age is one of the most significant risk factors for stroke. Almost 70% of patients with stroke are known to be over 65[5]. The study by Reganon et al. revealed the average age of patients with ischemic stroke to be 65.3 ± 8.2[6], while Yoneda et al. stated it to be 70 ± 11[7], Williams et al. to be 64± 3[8], and Hakbilir et al. to be 63.5 ± 13.6[9]. The average age of patients with ischemic stroke was found to be 69.74±11.72 consistent with the literature.

Among various studies including all age groups, acute ischemic stroke was determined to be more frequent among males[9-12]. Our results were consistent with the literature. We also suggest that being male is a risk factor for CVD. Moreover, we believe that the consistency of demographic features of our study such as age and sex with the literature is a proof for the confirmation of the validity of the patients' data included in this study.

Smoking, HT and DM are among the most common risk factors for stroke[13-16]. Efstathiou et al. determined that 52.6% of the 192 ischemic stroke patients had HT history[17]. Silvestrelli et al. detected HT in 61% of the 2395 stroke patients[18]. Rabkin et al. indicated HT to be the most frequent risk factor as found 53.1% of 1392 ischemic stroke cases[14]. Pancioli et al. reported that 13% of stroke patients had DM[19]. Du et al. also reported that 19.9% of the ischemic stroke patients had DM[20]. Our results revealed that smoking, HT and DM were the most common patient history with 70%, 68% and 34%, respectively. We believe that pathological change in the vascular-endothelial structure due to HT, DM and smoking causes a risk for stroke.

CRP is used as a biomarker with high sensitivity in many diseases especially where inflammatory cascade takes a role. Chang et al. reported a significantly higher CRP values in ischemic stroke patients compared to the control group[21]. Palasik et al. reported that CRP level significantly increases right from the first day in ischemic stroke[22]. Rost et al. detected a significant increase in plasma CRP concentrations both in acute ischemic stroke and temporary ischemic attack[23]. High CRP levels are known to increase ischemic stroke two fold in men, and cause 7 fold increase in stroke or myocardium infarcts with 5 fold increase by any vascular incident in women[24, 25]. Indeed, we detected high CRP levels in stroke patients in our study. Even though we did not detect a significant correlation between CRP and MRS in our study, we suggest that CRP can represent an inflammation related to the aetiopathogenesis of ischemic stroke as an acute phase reactant and can be used as a plasma marker for atherotrombotic diseases.

MRS is a scale used in the follow-up of stroke patients and it determines the intension of stroke, and is used to detect the dependency, and to evaluate the functional recovery. According to this scale, the ones with 1 and 2 scores survive independently, while the ones with 3 or more keep living dependently. Besides MRS being the most common and most frequently used prognosis scale, there are data showing that NLR can also provide efficient data on prognosis[26-28].

Neutrophils are the earliest leucocyte subtype that are released from the related sections after acute ischemic stroke happens[29]. Moreover, they are known to contribute to the

negative effects of ischemic damage by releasing of toxic inflammatory cytokines[30,31]. Aytaç et al. stated that NLR values increase in stroke cases[26]. Kocatürk et al. evaluated the correlation between NLR with 3 months mortality in 107 diseases, and reported a relation between NLR and infarct volume[27]. Demir et al. compared NLR and MRS and found that NLR is significantly higher in poor prognosis[28]. Our results were consistent with the literature.

Limitations of the study

The narrow sample size and not excluding the other possible inflammatory diseases of the cases were the most important limitations of this study. Moreover, there is the limitation resulted from the ignorance of a possible inflammation process depending on the use of the values in blood test drawn during the application to emergency service which was used to determine the NLR

Conclusion

To conclude, elder, smoking status, HT, and DM are still among the risk factors for acute ischemic stroke. MRS has been frequently used for the prognosis follow up of the patients. Although there are studies suggesting the use of NLR as a prognosis marker, for the generalization of these data they should be supported with many further randomized and controlled studies.

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Case Report
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Management of a Case of Gangrenous Cholecystitis Detected in the Emergency Department

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Abstract

Objective: Acute cholecystitis is a condition that most clinicians know how to examine and treat, however, evaluation of the radiological findings of gangrenous gallbladder disease and estimation of the urgency of the situation may not be familiar to the emergency physician.

Case Report: A 79-year-old female patient was admitted to our Emergency Department with abdominal pain. Findings of cholecystitis were found in her examination and tests. No clear information could be obtained on computed tomography. Abdominal ultrasound was requested because a high probability of gallbladder pathology was considered in the diagnosis. Floating membranes (considered as a sign of gangrenous cholecystitis) were seen in the gallbladder and free fluid at the pelvic level were detected. Due to the comorbidities of our patient, percutaneous drainage catheter was initially planned by the General Surgeon, but due to the deterioration of her general condition, she was taken to emergency operation. Perforation was detected in the gallbladder neck during the operation. She was treated at the hospital for 30 days and was discharged with recovery.

Results and Conclusion: Acute gangrenous cholecystitis is a rare cause of gallbladder diseases. It is difficult to diagnose for emergency physicians when clinical signs are unclear. In this article; we aimed to remind emergency physicians that the picture of cholecystitis can worsen rapidly, what should be considered in the examinations and complications.

Key words: Gangrenous cholecystitis, Floating membranes, Acute cholecystitis, Emergency Department

Introduction

Acute gangrenous cholecystitis (AGC) is a rare cause of acute abdominal pain. It is seen in the advanced stage of acute cholecystitis. AGC risk factors include diabetes mellitus, male gender, advanced age, and coronary heart disease. Gangrenous cholecystitis can be seen in 2-29% of all cases of acute cholecystitis[1]. It is thought that gangrenous cholecystitis develops as a result of abnormal gallbladder distension and subsequent ischemic mural necrosis due to vascular insufficiency[2]. Especially in patients who develop stony cholecystitis; If the stone blocks the bladder neck, epithelial damage due to vascular injury, localized ischemia and necrosis of the gallbladder wall develops.

As in all patients with cholecystitis the first imaging method in AGC patients should be abdominal ultrasound (USG). Sonographic findings suggestive of gangrenous changes; Intraluminal floating membranes (indicating exfoliated mucosa), echogenic shadows compatible with gas in the gallbladder wall or lumen, significant loss of wall integrity, and pericholecystic abscess formation[3]. Specific computed tomography (CT) findings suggestive of gangrenous cholecystitis; gas foci in the gallbladder wall, lack of contrast enhancement (focal or diffuse), intraluminal membranes and pericholecystic abscess formation. AGC should also be considered in cases where the wall shows a layered structure and there is more than normal enhancement in the liver parenchyma[4,5].

Case

A 79-year-old female patient applied to our Emergency Service with complaints of abdominal pain and fainting. She was previously diagnosed with hypertension, diabetes, and chronic bronchitis. In her examination, her vital signs were stable, and no neurological deficit was found. Abdominal examination revealed tenderness in the epigastrium and right upper quadrant. Murphy's sign was suspiciously positive. Electrocardiography (ECG) showed normal sinus rhythm. In the blood tests taken; leukocyte 12 10*9/lt, C-Reactive Protein 0.7 mg/dl, amylase 1191 U/lt, direct bilirubin 1.53 mg/dl, Gamma-glutamyl transferase 101 U/lt, lipase 2974 IU/lt, alanine aminotransferase 120 U/lt, and blood sugar 180 mg/dl, other blood values were found to be normal. According to these results, contrast-enhanced abdominal CT was re-

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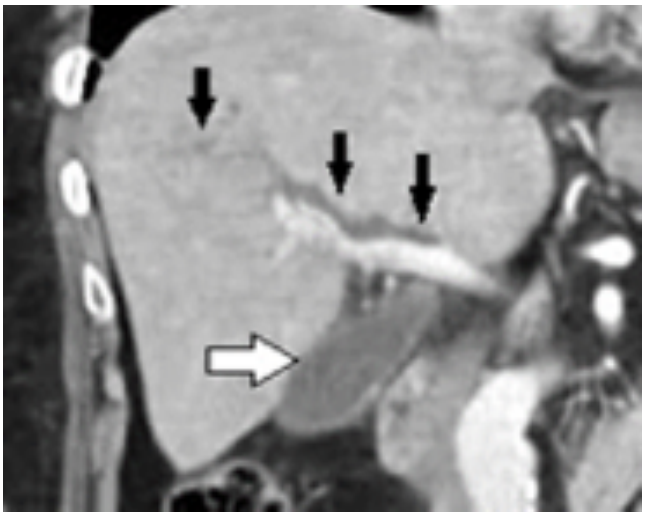

Figure-1: Mild-dilated intrahepatic bile ducts ((*black arrows*) in CT scan with IV contrast material. The gallbladder wall appears regular and intact (*white arrow*).

Figure-2: Thickened gallbladder wall (*uncolored arrow*), intraluminal membranes representing sloughed mucosa (*white arrows*) in Ultrasonogram. Free fluid is observed around the liver (stars).

quested with the preliminary diagnosis of acute pancreatitis. It was reported as 'moderate dilatation was observed in the intrahepatic bile ducts, the diameter of the common bile duct was 8 mm, there is no wall thickness in the gallbladder, there is no pathology in the pancreatic tissue' (Figure-1). The result of the abdominal USG performed for the gallbladder pathology immediately after CT: 'Moderate dilatation of the intrahepatic bile ducts, an increase in the thickness of the gallbladder wall (5 mm), and intraluminal membranes in the gallbladder lumen were detected. There was no pericholecystic abscess. Free fluid was observed in the abdomen' as seen in Figure-2.

Because our patient had additional diseases, the infection parameters were not very high, and her vital signs were stable; she was admitted for medical treatment, percutaneous catheter (PC) drainage with a preliminary diagnosis of cholecystitis was planned by the general surgeon. Intravenous aerobic and anaerobic antibiotic therapy was started. Magnetic resonance cholangiopancreatography (MRCP) was requested as further investigation (Figure-3,4) and

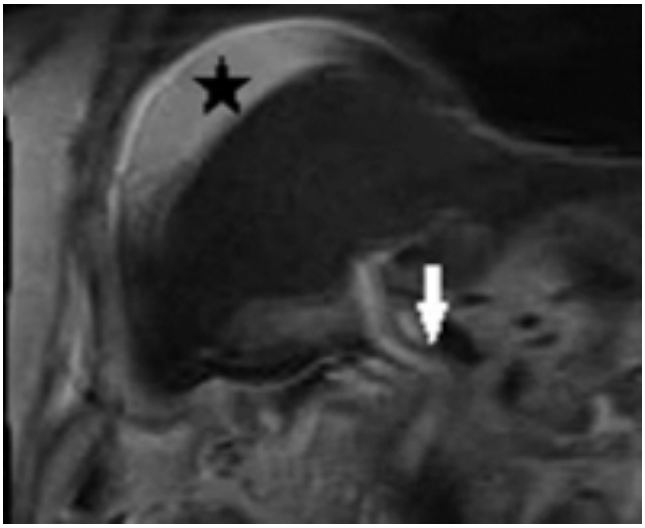

Figure-3: MRCP image of the same patient. No stones are observed in the choledochal lumen (*white arrow*). Free fluid is observed around the liver (star).

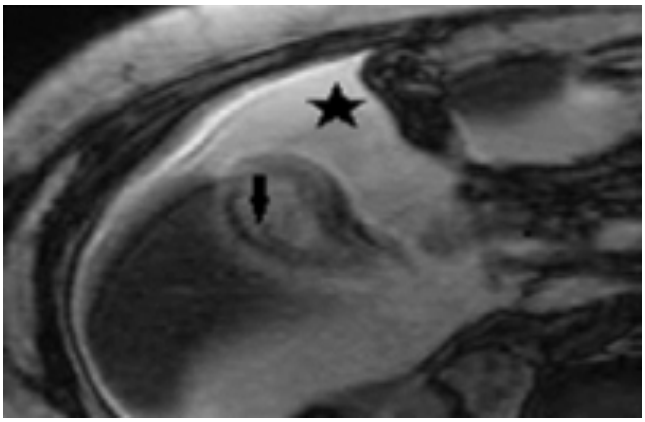

Figure-4: Hypointense intraluminal membranes in the gallbladder (*black arrow*) and free fluid around the liver (star) in axial T2-weighted MR image

MRCP findings were reported as: 'Free fluid was observed around the liver and the spleen. Gallbladder wall thickness has increased, intraluminal membranes were observed in the gallbladder lumen. No stones were detected in the lumen of the common bile duct'.

While the interventional procedure was planning, the patient's blood pressure dropped to 80/50 and she had pre-syncope, the level of CRP (20.7 mg/dl) and leukocyte (18.66 10*9/l) increased, therefore emergency laparotomic surgery was performed. During the operation, it was observed that there was a gallbladder neck perforation. The gallbladder was examined by the pathologist and it was reported as 'multifocal necrotic areas were observed on the outer surface'. Our patient was discharged with recovery after being followed up in the post-operation intensive care unit for 30 days.

Discussion

AGC is a rare, fatal form of cholecystitis that can worsen rapidly if undiagnosed, and may be difficult to differentiate from acute cholecystitis by physical examination and laboratory tests. Typical Murphy sign positivity may not always be seen. In a study by Simeone et al., they found that Murphy's sign was positive in only 33% of cases of AGC, and they explained this with denervation of the gallbladder wall[6]. Although our patient also had a disease such as diabetes that could cause neuropathy, the suspicious positive murphy sign gave us a clue and further examination was performed to rule out upper abdominal pathologies.

In AGC, bilirubin and infection parameters are found to be significantly higher, just like in patients with non-gangrenous acute cholecystitis. To distinguish it, the focus should be on radiological methods. Abdominal USG is the examination that best detects gallbladder pathology and should be requested first. Since very high values were observed in pancreatic examinations in our case, we primarily requested contrast-enhanced abdominal CT to rule out pancreatitis. Even if there was no finding suggestive of gallbladder infection or perforation in the CT report, abdominal USG for the gallbladder was also performed immediately afterward, and findings in favor of cholecystitis were observed. 'The membranes in the gallbladder' on the requested abdominal USG suggested gangrenous cholecystitis.

In AGC patients; Gallbladder perforation develops as a result of transmural necrosis and is seen in 2%-11% of cases of acute cholecystitis. The gallbladder mucosa peels inward. The most common perforation site is the fundus. Small areas of perforation are difficult to detect on imaging. A focal defect in the gallbladder wall can be seen on USG, CT, and MR images. Extraluminal gallstone is a specific imaging finding indicating perforation[7, 8]. In our patient, the perforation site was found to be the neck of the gallbladder, unlike the literature. In perforations in the fundus, since it is the largest anatomical region of the gallbladder, there is a faster and greater amount of fluid escape. In our patient; The bile flow in the form of leakage from the neck of the gallbladder became evident over time, a late finding occurred in the patient and caused a sudden clinical change.

In patients with gangrenous cholecystitis with or without perforation, emergency surgery is usually preferred. When perforation develops, laparotomic surgery is performed. Intravenous (IV) antibiotics should be added to the treatment. In patients in whom surgical intervention cannot be performed, PC drainage can be applied[9]. In the case of AGC examined by Faraji et al., only a drainage was applied without any operation, although there was a perforation. They preferred this form of treatment because the case was asymptomatic and the general condition had not deteriorated[10]. Due to the advanced age of our patient, her good general condition, and comorbidities, the general surgeon decided to apply PC drainage as the primary treatment method. However, laparotomic surgery was performed after the infection parameters increased despite IV antibiotic treatment, the amount of free fluid in the abdominal cavity increased and the general condition of the patient deteriorated.

Conclusion

Cases of AGC usually present with clinical findings indistinguishable from non-gangrenous cholecystitis symptoms, and more meticulous evaluation of imaging tests is required to reach an accurate diagnosis in patients. Since patients with AGC usually show symptoms of non-gangrenous acute cholecystitis, it does not seem like a condition that can be overlooked, but further investigation may waste time and increase the risk of perforation. In this case, the physician who will perform the surgical procedure will need to be more meticulous and act quickly when choosing the treatment method, and also be alert to possible problems.

In this article; We aimed to remind the emergency physician who first examines the patient, to recognize the findings in the radiology reports, to emphasize the importance of radiology methods in detecting gallbladder or bile duct pathologies, and to guide the surgeon in the field of emergency interventional procedures.

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