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Original Article

Investigation of the Relationship of Self-Efficacy in Labour And Birth Anxiety Between Primiparous and Multiparous Pregnant Women: A Descriptive Cross-Sectional Study

Fazil Avci[1]
Abdullah Goymen[2]
Ayhan Coskun[3]
Mehmet Kulhan[1]
Cetin Celik[1]
Ayse Ceren Duymus[1]
Ahmet Bilgi[1]

[1]Department of Obstetrics and Gynecology, Faculty of Medicine, Selcuk University, Konya, Turkiye
[2]Department of Obstetrics and Gynecology, Faculty of Medicine, Sanko University, Gaziantep, Turkiye
[3]Department of Obstetrics and Gynecology, Faculty of Medicine, Mersin University, Mersin, Turkiye

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Corresponding Author: Fazıl Avci, Department of Obstetrics and Gynecology, Faculty of Medicine, Selcuk University, Konya, Turkiye

E-mail: fazilavci01@hotmail.com

Abstract

Aim: Fear of childbirth, anxiety and self-efficacy are important parameters in pregnant women in terms of both the continuation of pregnancy and the type of delivery. There are different results in studies on these subjects. We aimed to investigate the relationship of self-efficacy and anxiety between primiparous and multiparous pregnant women.
Materials and Methods: A total of 76 pregnant women who were among third trimester of pregnancy who applied to the clinic for delivery, were included in the study in our clinic. 34 pregnant women were primiparous and 42 pregnant women were multiparous. 76 pregnant women's demographic data were compared with self-efficacy and anxiety scale scores between the two groups.
Results: Of the 76 cases included in the study, 34 were primiparous and 42 were multiparous. The mean age of primiparous was 23.4±3.6 years, while it was 28.7±5.6 years in multiparous pregnants, which was statistically significant (p=0.020). Demographic and pregnancy related outcomes between both groups were similar. Regarding self-efficacy, the outcome was not found to be statistically significant according to the expectation scale (p=0.984), and the efficacy expectation sub-scale (p=0.610). Regarding anxiety, the outcome was found statistically insignificant (p=0.564) between the two groups according to the Beck Anxiety Scale.
Conclusion: There was no difference in terms of birth fear and self-efficacy scores, but high birth anxiety scores were found in both groups. It will be beneficial for pregnant women to be informed and supported in order to reduce their high anxiety about child birth.

Keywords: Birth, multiparity, primiparity, self-efficacy, test anxiety scale

CITATION

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INTRODUCTION

Anxiety, fear of childbirth and self-efficacy during pregnancy are important parameters for continuation of pregnancy and mode of delivery. Confidence in labor and birth, was defined as birth self-efficacy, has been defined as an significant indicator of women's coping skills during labor (1). Self-efficacy is assessed in two steps. Expectation regarding result refers to the confidence that a behavior will lead to a certain outcome. Self-efficacy as a belief is defined as an individual can successfully do this behavior in a given context (1).

Pregnancy, childbirth and postpartum period can cause stress in women and their partners and increase the risk of anxiety (2). Primiparity means giving birth for the first time; this often means having feelings of inexperience and an inability to evaluate the

birth experience. As a result, primiparous women are more likely to feel uncertainty and fear about childbirth than multiparous women. Fear or anxiety about childbirth has been associated with negative outcomes, such as increased negative birth experiences (3,4). Birth is also associated with self-efficacy. Self-efficacy degrees can be measured thoroughout the pregnancy to assess coping efforts and self-confidence skills. In addition, vaginal delivery could be affected by the motivation degree of pregnant women.

While there are studies in terms of self-efficacy and fear among primiparous and multiparous pregnant women during pregnancy and third trimester, there are not enough studies in the literature in terms of anxiety. For this reason, we planned to conduct a study on this issue in pregnant women who delivered in the third trimester. In this study, we aimed to investigate relationship of self-efficacy and anxiety scales between primiparous and multiparous pregnant women and the demographic factors affecting them.

MATERIALS AND METHODS

This research is a methodologically descriptive and cross-sectional study which studied between September 5, 2016 and October 5, 2016. The population of the study included 76 pregnant women who admitted to the clinic for delivery during the research period and who accepted the terms of study, and were primiparous and multiparous in a singleton, cephalic presenting and third trimester pregnancy. The cases were divided into two groups as primiparous and multiparous pregnant women. In this study application of survey and likert type scales were made by the researcher using face-to-face interview technique.

The study was conducted in accordance with research and publication ethics. The study approval was obtained with the number 519 by the Konya province public hospitals Association. Approval was obtained with the date of 05.9.2016 and numbered 96512028/604.01.01 to conduct the study entitled 'investigation of the relationship between anxiety and self-efficacy among primiparous and multiparous pregnant women in Aksehir State Hospital.

Inclusion criterias for the study consisted of cases who is in the third trimester of pregnancy, who have single vertex position fetus and hospitalization in the delivery room. Exclusion criterias determined as having multiple pregnancy, pregnancy complications such as placenta previa, preeclampsia, intrauterine growth retardation, gestational hypertension, gestational diabetes, non-cephalic positioned fetus, psychiatric disorder or systemic disease and being in first or second trimester of pregnancy. The participants were informed about the study and signed the “Informed Voluntary Consent Form”. Written permission was obtained for the pregnancy information form, which was used as a data collection tool, the short form of the self-efficacy scale in labor (Outcome Expectation Sub-Scale-16 questions and Efficacy Expectation Sub-Scale-16 questions) and the Beck anxiety scale.

Data Collection Tools

Pregnancy information form: It was prepared by the researcher in the light of the literature in order to define obstetric histories and demographic characteristics of women and consists of 17 questions. This form created for the determination of socio-demographic characteristics of cases such as age, family type, place of residency, education, employment and occupation; and obstetric characteristics such as number of living children, number of pregnancies, gestational week of pregnancy, pregnancy planning status, presence of complication in previous pregnancy, and current pregnancy. Before starting the study, the pregnant women were informed about the study by the researcher. It was stated that the information obtained will only be used for scientific purposes. It was stated that their personal information would be protected and their verbal consent was obtained in line with the principle of voluntariness. The results of the study are limited to the data of the pregnant women who accepted to join in the research and can be generalized to the pregnant women enrolled in the study.

Scales used in the study

Short form of the self-efficacy scale in labor: The Self-Efficacy Scale in Labor was developed by Lowe in 1993 (5). It is a scale consisting of 62 questions that measures effect of coping skills and women's self-confidence. Ip et al. (6) developed a new short form by reducing previous form developed by Lowe in 2005. The Turkish validity and reliability study of this form by Ersoy in 2011 was conducted (7). She suggested that this scale can be applied to pregnant women between 26-40 weeks.

Beck anxiety scale: It is a test created by Dr Aaron T. Beck. It is generally used for screening rather than diagnosis. This scale consists of 21 questions in total. After marking 21 questions, the points are added up. According to these scores; 0-7 points show minimal anxiety, 8-15 points show mild anxiety, 16-25 points show moderate and 26-63 points show severe anxiety symptoms (8,9).

Statistical Analysis

SPSS version 21 (IBM Corporation, Armonk, NY, USA) for all statistical calculations was used. Some descriptive features (mean, standard deviation) in the study were evaluated with the help of descriptive statistical tests. Comparisons between groups for parameters with a normal distribution approach were tested with Independent t-test and one-way ANOVA test aids, and for parameters without a normal distribution approach, comparisons between groups were tested with Mann Whitney U test. Comparisons for categorical parameters were analyzed with the help of Pearson's Chi-Square test and Fisher's Exact test. A p-value <0.05 was accepted significant.

RESULTS

Out of 76 cases, 34 were primiparous and 42 were multiparous pregnants (Table 1). While the mean age of primiparous women

was 23.4±3.6 years, it was 28.7±5.6 years in multiparous pregnants, which was statistically significant (p=0.020). The median week of gestation was 39 weeks (34-41) in primiparous and 39 weeks (29-41) in multiparous women, and no statistically significant difference was found (p=0.527). There was no statistically significant difference in terms of family type, residence place (city and county), education, employment status, and occupation status.

Table 1. Distribution of demographic data of primiparous and multiparous pregnant women

		Primiparous (n=34)	Multiparous (n=42)	p
Age (year), Mean±SD		23.4±3.6	28.7±5.6	**0.020**[a]
Family type, n (%)	Nuclear	22 (64.7)	29 (69.0)	0.807[b]
	Extended	12 (35.3)	13 (31.0)	
Residence, n (%)	Province	2 (5.9)	1 (2.4)	0.350[b]
	District	25 (73.5)	25 (59.5)	
	Village	7 (20.6)	16 (38.1)	
Education status, n (%)	Illiterate	3 (8.8)	2 (4.8)	0.159[b]
	Primary	7 (20.6)	14 (33.3)	
	Secondary	10 (29.4)	18 (42.9)	
	High	10 (29.4)	6 (14.3)	
	University	4 (11.8)	2 (4.8)	
Employment status, n (%)	Yes	3 (8.8)	2 (4.8)	0.651[b]
	No	31 (91.2)	40 (95.2)	
Occupation status, n (%)	Government official	2 (5.9)	1 (2.4)	0.397[b]
	Other	8 (23.5)	6 (14.3)	
	Housewife	24 (70.6)	35 (83.3)	

SD: Standard Deviation
n: Number, %: Percentage
[a]: Mann-Whitney U test, [b]: Chi-square test

Number of living children was questioned and 45.2% of women answered as 2 children, 35.7% answered as 3, and 19% answered 4 and above (Table 2). There was no difference in terms of planning pregnancy, complication in the previous pregnancy and in the current pregnancy, preparation for delivery, support during pregnancy, thoughts of labor problem, thoughts of labor pain, and fear of childbirth problems.

Outcome expectation scale scores in primiparous and multiparous pregnants were calculated as 119.6±25.6 and 122.0±25.2 respectively and proficiency expectation was 104.3±30.1 and 99.2±27.6 respectively (p=0.984 and p=0.610, respectively) (Table 3). It was not statistically significant between the two groups. The total self-efficacy scale were recorded as 220.8±38.7 and 221.1±40.4, respectively (p=0.632) and no statistically significant difference was found. Beck anxiety levels were found to be 36.1±11.0 and 37.9±14.1 in primiparous and multiparous, respectively (p=0.564) and no statistical difference was found.

Table 2. Distribution of obstetric histories of primiparous and multiparous pregnant women

		Primiparous (n=34)	Multiparous (n=42)	p
Residence, n (%)	1	-	0 (0.0)	**0.001**[a]
	2	-	19 (45.2)	
	3	-	15 (35.7)	
	≥4	-	8 (19.0)	
Gestational age (week), median (min-max)		39 (34-41)	39 (29-41)	0.527[b]
Planning pregnancy, n (%)	Yes	27 (79.4)	27 (64.3)	0.205[a]
	No	7 (20.6)	15 (35.7)	
Problem history in the previous pregnancy, n (%)	Yes	-	11 (26.2)	0.726[a]
	No	-	31 (73.8)	
The problem status in current pregnancy, n (%)	Yes	4 (11.8)	10 (23.8)	0.239[a]
	No	30 (88.2)	32 (76.2)	
Preparation for delivery, n (%)	Yes	13 (38.2)	16 (38.1)	0.588[a]
	No	21 (61.8)	26 (61.9)	
Support during pregnancy, n (%)	Yes	28 (82.4)	34 (81.0)	0.558[a]
	No	6 (17.6)	8 (19.0)	
Thought of labor problem, n (%)	Yes	13 (38.2)	16 (38.1)	0.588[a]
	No	21 (61.8)	26 (61.9)	
Thought of labor pain, n (%)	Yes	27 (79.4)	38 (90.5)	0.204[a]
	No	7 (20.6)	4 (9.5)	
Fear of childbirth problem, n (%)	Yes	27 (79.4)	25 (59.5)	0.084[a]
	No	7 (20.6)	17 (40.5)	

n: Number, %: Percentage
[a]: Chi-square test, [b]: Mann Whitney U test

Table 3. Distribution of self-efficacy and anxiety among primiparous and multiparous cases

	Primiparous (n=34)	Multiparous (n=42)	p
Average of Outcome Expectation Scale Scores	119.6± 25.6	122.0±25.2	0.984[a]
Proficiency Scale Average score	104.3± 30.1	99.2± 27.6	0.610[a]
Total self-efficacy scale score	220.8± 38.7	221.1±40.4	0.632[a]
Beck Anxiety Scale score	36.1±11.0	37.9±12.7	0.564[a]

[a]: Independent samples t-test

DISCUSSION

Pregnancy period, preparation for childbirth and the idea of pregnancy cause different results in primiparous and multiparous women. In this research, there were no statistical significant difference between primiparous and multiparous pregnant

women according to demographic characteristics, obstetric history and self-efficacy scores although there was no statistical significant difference in the terms of anxiety between groups. But, we realised that both groups had high anxiety scores.

Salomonsson et al. found that there were not any correlation between demographic data and birth self-efficacy in their studies (10). In addition, IP et al. and Khorsandi et al., could not find a relationship between self-efficacy and age (6,11) and education level (6). Contrary to these studies, Shakarami et al. in the study consisting of a total of 200 pregnant women, 100 primiparous and 100 multiparous, who applied to the their obstetrics service found that age, education status, economic status, baby desire plan, participation in delivery course were statistically significant between primiparous and multiparous pregnant women, while occupational status and presence of widow at birth were found to be insignificant (12). Similarly, in this research, there were no statistical significant difference between primiparous and multiparous pregnant women according to demographic data, except for age. Regarding parity, it revealed high self-efficacy scores for both nulliparous women (13) and multiparous women (5). On the contrary, in many researches, the self-efficacy expectations scores of multiparous women were found statistical significantly higher than the primiparous women scores (12,14). In this study, high self-efficacy scores were found in both primiparous and multiparous pregnant women in terms of parity. There was no statistically significant difference between the two groups.

Fleming et al. (15) showed that all pregnant women were afraid of being left alone in labor, but when multiparous women felt unsupported, their self-efficacy decreased and their anxiety increased. Virit et al. showed that third trimester pregnant women have high levels of anxiety and depression, and decreased social support was shown to be a risk for depression (16). Similar to this study, primiparous and multiparous pregnant women were found to have support for birth at a rate of 82.4% and 81%, respectively, and their self-efficacy was high. However, high levels of anxiety were detected in both groups. This may be due to the uncertainty of how the labor will be and how it will result.

Primiparous pregnant women tend to fear an unknown pain and not being able to control it. The fear in multiparous pregnant women may arise from previous birth experiences (17). In the studies, fear of childbirth was found to be higher in primiparous pregnants compared to multiparous pregnants women (12, 18,19). On the contrary, in a study, there was no statistical significant difference between primiparous and multiparous pregnant women according to fear scores (20). Contrary to these studies, there are studies reporting a higher rate of fear score in multiparous pregnant than in primiparous pregnant (21,22). In this present study, however, no statistically significant difference was found between primiparous and multiparous pregnant women according to fear of childbirth. The difference of our research from the other ones is that our study only consists of cases hospitalized for third trimester delivery.

Anxiety in pregnancy is characterized by current and future concerns about pregnancy (23). Conditions that cause anxiety in mothers during pregnancy and childbirth are lack of knowledge and fear of the unknown. Anxiety about the upcoming birth intensifies in the last trimester (20). In the studies, they did not find any difference between primiparous and multiparous women in anxiety levels during pregnancy (12,24). In addition, studies have found that the presence of children, higher education status and age have a protective effect on the dimensions of pregnancy-related anxiety (25,26). In this present study, no statistically significant difference between the two groups in terms of anxiety levels was found. However, our difference from the present studies was that we found high anxiety scores in the third trimester and in both groups.

Addressing fear of birth through midwifery psychoeducation has been found to significantly improve women's birth confidence (27). In addition, it has been found that as social support increases in pregnant women, fear of birth may decrease (28) and prenatal birth education contributes to the reduction of fear of birth and bad thoughts about birth (29). By investigating self-efficacy, anxiety and demographic data that can affect them, we can help to identify pregnant women at risk earlier and we can develop more targeted interventions.

CONCLUSION

As a result, when primiparous pregnants were compared with multiparous pregnants, no statistically significant difference was found in terms of birth fear and self-efficacy scores, but high birth anxiety scores were found in both groups. It would be beneficial for pregnant women to be informed, supported and assisted by health administrators in order to reduce their high birth anxiety.

Limitations

The limitations of this present study were the small number of cases, the lack of labor pain scoring, and the lack of use of the fear of labor scoring scale. Its strengths were the detailed investigation of self-efficacy, Back anxiety scale and demographic data affecting them only between third trimester primiparous and multiparous pregnant women.

Competing interests: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study hasn't received no financial support.

Ethical approval: The study approval was obtained with the number 519 by the Konya province public hospitals Association. Approval was obtained with the date of 05.9.2016 and numbered 96512028/604.01.01 to conduct the study in Aksehir State Hospital.

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Original Article

The Impact of Neighborhood Safety on the Anxiety Levels of Prehospital Emergency Care Professionals - A Research Article

Gulsah Cikrikci Isik[1]
Eren Usul[2]

[1]Department of Emergency Medicine, Atatürk Sanatoryum Training and Research Hospital, University of Health Sciences, Ankara, Turkiye
[2]Department of Emergency Medicine, Etlik City Hospital, Ankara, Turkiye

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Corresponding Author: Gulsah Cikrikci Isik, Department of Emergency Medicine, Atatürk Sanatoryum Training and Research Hospital, University of Health Sciences, Ankara, Turkiye

E-mail: gulsah8676@gmail.com

Abstract

Aim: The aim of this study was to evaluate the impact of neighborhood crime and violence rates on the anxiety levels of prehospital emergency care professionals.
Materials and Methods: A cross-sectional study was conducted in Ankara, the capital city of Turkiye. Prehospital emergency care professionals working in the districts with the highest and lowest crime rates were included. A survey was used to evaluate the characteristics and anxiety levels of the participants.
Results: A total of 119 surveys were. Seventy-nine percent of the participants declared that they had experienced workplace violence. The median instantaneous anxiety level of all participants was 47 (IQR 38–53), and the mean general anxiety level of all participants was 44.4±9.0. Rates of experiencing violence against health care professionals were similar between low-crime and high-crime districts (75.6% vs. 81.1%, $p = 0.470$). Feeling anxious about one's work district was more common among those who were working in districts with high crime rates (75.7% vs. 37.8%, $p < 0.001$).
Conclusion: Neighborhood safety was a predictor of prehospital emergency care professionals' feeling anxious about working in a given district. Moreover, anxiety levels and experiencing workplace violence were high in all participants, regardless of local crime rates.

Keywords: Prehospital, workplace violence, neighborhood safety, anxiety, mental health

CITATION

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INTRODUCTION

Occupational stress which is defined as physical and emotional complaints as a consequence of a mismatch between a worker's needs, capabilities, and job requirements is a global public health problem (1). Medical workers especially ambulance personnel because of the many stressors they endure, such as long working hours, exposure to traumatic events, and the risk of contracting a disease are among the professionals with the highest occupational stress levels (2). Consequently, the incidence of psychiatric disorders, such as depression, anxiety, and post-traumatic stress disorders, is higher among emergency care professionals than it is among the general population (3).

One of the most important risk factors for mental health problems among medical workers is workplace violence; thus, two-thirds of medical workers had mental health problems after exposure to a threat of violence against themselves or their colleagues (4,5). The impact of violence against medical personnel on the mental wellness of the victims is already known (3-5). The new entity is the effect of local crime rates and neighborhood safety on mental health. Meyer et al. demonstrated that socioeconomic status and neighborhood safety are determinants of mental health (6). However, there is still less evidence on whether living or working in neighborhoods with high crime and violence rates impacts individuals' mental health (7). The aim of this study was to evaluate the impact of neighborhood crime and violence rates on the anxiety levels of prehospital emergency care professionals.

MATERIALS AND METHODS

This cross-sectional study was conducted in Ankara, the capital city of Turkiye, with the approval of the ethics committee. Data obtained from the provincial police department were used to determine the districts with the highest and lowest crime rates. Prehospital emergency care professionals (paramedics, nurses, emergency medicine technicians, ambulance drivers, and physicians) working in the two districts with the highest crime rates and the one district with the lowest crime rate were included in the study. For data collection, surveys created using Google Forms were sent to participants via email and social media groups (WhatsApp®). Participation was voluntary.

The survey comprised two parts. The first part asked questions about respondents' characteristics, such as age, gender, professional experience, whether they had experienced violence against themselves or witnessed violence against a colleague, whether they had a history of psychiatric disease and/or medicine use, their opinions about the safety of the area in which they work, and whether they felt anxious about working in that district.

The second part of the survey was the state-trait anxiety inventory (STAI) form, which was developed by Spielberger et al., and Turkish validity and reliability were assessed (8). The first part of this form was used to evaluate anxiety levels at certain moments, and the second part was used to evaluate the general anxiety level of the participant. Each part of the form consisted of 20 phrases, and total scores could range from 20 to 80. STAI scores are commonly classified as "no or low anxiety" (20–37), "moderate anxiety" (38–44), and "high anxiety" (45–80) (9). Participants were asked to answer the survey at the beginning of their shifts. Only fully answered surveys were evaluated.

Ethics committee approval was received for this study from the ethics committee of Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital, Ankara, Turkiye [Date: 06.04.2022 - No: 2022-03/1732].

Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences, version 22.0 (SPSS Inc., Chicago, IL, USA). Categorical data were expressed as percentages, and continuous variables were expressed in terms of (a) mean and standard deviation or (b) median and interquartile range (IQR) (25%–75%), depending on the distribution of normality. The answers of workers in high-crime districts were compared to those of workers in low-crime districts using the Mann-Whitney U test, independent samples t-tests, and Chi-square tests. A p value of less than 0.05 was considered statistically significant.

Data set should be received from Mendeley Data with a doi number 10.17632/n9hmmfpbr3.1.

RESULTS

A total of 119 surveys (participants) were evaluated for the study. Sixty-seven of the participants were female, and the median age of the participants was 31 (IQR 28–35). Most of the participants were paramedics or emergency medicine technicians, and 45 of the participants were working in the low-crime district. Most of the participants declared that they had experienced violence against themselves or witnessed violence against their colleagues (79%). The median of experiencing violence was once in a year. Twenty percent of the participants declared that they had psychiatric disorders, which were commonly depression or anxiety disorders. Only one-third of the participants thought that the area they were working in was safe, and 61% felt anxious about the district in which they work. The median instantaneous anxiety level of all participants was 47 (IQR 38–53), and the median general anxiety level of all participants was 44.4±9.0. The data are summarized in Table 1.

Table 1. General characteristics of the participants

Gender, n (%)	Female	67 (56.3)
	Male	52 (43.7)
Age, Median (IQR 25-75)		31 (28-35)
Duty, n (%)	Paramedics	46 (38.7)
	Emergency medicine technicians	50 (42)
	Physicians	14 (11.8)
	Ambulance drivers	9 (7.5)
District, n (%)	Low crime rate	45 (37.8)
	High crime rate	74 (62.2)
Professional experience as year, Median (IQR 25-75)		11 (7-12.5)
Experienced violence against themselves or witnessed violence against their colleagues, n (%)	Yes	94 (79)
Frequency of violence per year, Median (IQR 25-75)		1 (I1-1)
History of psychiatric disorder, n (%)	Yes	24 (20.2)
	Depression	8 (6.7)
	Anxiety disorder	9 (7.6)
	Post traumatic stress disorder	3 (2.5)
	Other	4 (3.4)
Opinion about safety of the area in which they work, n (%)	Yes safe	41 (34.5)
Feeling anxious about the district in which they work, n (%)	Yes	73 (61.3)
Instantaneous anxiety level (STAI-1), Median (IQR 25-75)		47 (38-43)
General anxiety level (STAI-2), Mean±SD		44.4±9.0

SD: Standard Deviation

Age, gender distribution, and history of psychiatric disorders

were statistically similar between the low-crime and high-crime districts (p=0.540; p=0.370; p=0.330, respectively). Both study groups reported experiencing similar rates of violence. However, there was a statistically significant difference in their opinions about the safety of the work area– the majority of the participants who worked in districts with high crime rates believed their work area was not safe. Similarly, feeling anxious about working in a district was more common among prehospital emergency care professionals working in districts with high crime rates. However, when comparing the instantaneous and general anxiety levels of all participants, there were no statistically significant differences in terms of working in either district (Table 2.)

Table 2. Comparison of districts with low and high crime rates

Variables (n=119)		Low crime district (n=45)	High crime district (n=74)	p
Gender, n	Female	23	44	0.370[a]
	Male	22	30	
Age, Median (IQR 25-75)		31 (28.5-36.5)	31 (27-35)	0.540[b]
Experienced violence against themselves or witnessed violence against their colleagues, n (%)	Yes	34 (75.6)	60 (81.1)	0.470[a]
	No	11 (24.4)	14 (18.9)	
History of psychiatric disorder, n (%)	Yes	7 (15.6)	17 (23.0)	0.328[a]
	No	38 (84.4)	57 (77.0)	
Opinion about safety of the area in which they work , n (%)	Yes safe	29 (64.4)	12 (16.2)	**<0.001**[a]
	No not safe	16 (35.6)	62 (83.8)	
Feeling anxious about the district in which they work, n (%)	Yes	17 (37.8)	56 (75.7)	**<0.001**[a]
	No	28 (62.2)	18 (24.3)	
Instantaneous anxiety level (STAI-1), Median (IQR 25-75)		45 (35.5-50.0)	47.5 (38.5-54.2)	0.077[b]
General anxiety level (STAI-2), Mean±SD		43.2±7.5	45.10±9.8	0.221[c]

SD: Standard Deviation, [a]: Chi-square test, [b]: Mann-Whitney U test, [c]: Independent samples t-test

DISCUSSION

Despite having no statistically significant differences in the STAI scores of the prehospital healthcare professionals working in districts with high and low crime rates, neighborhood safety was an important determinant of feeling anxious about working in that district. Notably, STAI scores were at moderate to high levels in both groups. Moreover, the results also showed that regardless of neighborhood safety, violence against prehospital healthcare staff was very high in both districts.

Workplace violence comprises all physically, verbally, or psychologically violent events that threaten the safety and well-being of staff members and is becoming a rampant global problem (10). Studies have demonstrated that the healthcare environment accounts for almost 70% of all workplace violence events reported worldwide (10). Prehospital emergency care professionals have a particularly high risk of facing violence because of the nature of their work, as they are the first to encounter patients in critical situations and must provide first aid at the scene (11). Many studies from different parts of the world reported that 60-87% of prehospital healthcare staff get across with some kinds of violence annually (10-12). We also observed a 79% prevalence of workplace violence among prehospital staff, which concurs with the existing literature.

Victims of workplace violence are more likely to experience negative mental reactions, such as anxiety, depression, sleep disorders, and post-traumatic stress disorder (13). In particular, high anxiety levels have been reported to be strongly correlated with encountering aggression (14); this may explain the moderate to high anxiety scores of our participants who encountered high rates of violence. Although several studies have been conducted on workplace violence in healthcare and its consequences on psychology of staff, only a few have explored the impact of social factors, such as neighborhood crime on workplace violence and mental health in the field of prehospital healthcare.

Many factors related to neighborhood conditions have been associated with mental health. A previous study reported that all forms of crime and/or violence in neighborhoods increased the prevalence of mental disorders in residents in Europe by nearly three times (15). Furthermore, studies about community psychology have demonstrated that regardless of an individual's personal exposure, living in neighborhoods with relatively more violence is associated with significantly elevated odds of anxiety disorders, and fear of crime is a particularly important risk factor for mental distress (16,17). One of the few studies specifically targeting healthcare professionals demonstrated that neighborhood violence in Brazil was associated with a 1.6 times greater risk of common mental disorders among community health workers (18). In our study, three-fourths of the participants from high-crime districts felt anxious about working in that region.

Therefore, neighborhood safety and anxiety about working in a region with high crime rates poses a serious risk to the mental health of healthcare professionals. To ensure the mental wellness of prehospital emergency care professionals, definite individual- and public-level interventions must be implemented. Some of the public interventions that might help reduce local crime rates include the restriction of alcohol availability, area rehabilitation,

building community facilities, or reducing poverty (7). On the other hand, at the individual level, it is crucial to implement programs to help detect and cope with mental health problems in healthcare staff (13). In this context, rotatory postings of the prehospital health staff between low- and high-crime districts might be a temporary solution; further comprehensive studies are warranted to develop more permanent solutions.

CONCLUSION

Neighborhood safety is a significant predictor of anxiety among prehospital emergency care professionals about working in a district with high crime rates. However, these professionals tend to experience high workplace violence and have generally high anxiety scores during their jobs, irrespective of the local crime rates. Therefore, substantial measures implemented at both the public and individual levels are essential to protect the mental health of healthcare workers.

Limitations

First, our study sample was small since participation was voluntary. Most of the prehospital healthcare staff contacted did not respond to the questionnaire; perhaps, the study title may have reminded them of their negative memories about this topic, or the feeling of weariness about the high number of similar surveys sent to health staff may have reduced participation.

Second, it was not possible to analyze whether the primary reason for the anxiety was workplace violence or personal determinants. Higher STAI-1 scores compared to STAI-2 scores may be accepted as a predictor of anxiety due to work; however, all STAI scores were generally high in our study sample. Therefore, we decided to use the answers to the phrase about neighborhood safety in the survey rather than the STAI-1 scores of the groups to evaluate its impact on anxiety levels.

Lastly, we categorized the districts according to data obtained from the provincial police department. This information was based on general public order crimes, and we could not obtain details of the types of crimes in these districts; so, it was not possible to analyze the impact of the different types of crimes on anxiety levels.

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Original Article

Can High-Sensitive Troponin T Be Used in the Diagnosis of Pulmonary Embolism? Retrospective Analysis

Sultan Ozselcuk[1]
Ertugrul Altug[2]
Semih Korkut[2]
Cansin Kumsal Dikmecli[2]
Kaan Cagrı Gurel[2]
Ramazan Guven[2]

[1]Department of Emergency Medicine, Nevsehir State Hospital, Nevsehir, Turkiye
[2]Department of Emergency Medicine, Basaksehir Cam and Sakura City Hospital, Istanbul, Turkiye

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Corresponding Author: Sultan Ozselcuk, Department of Emergency Medicine, Nevsehir State Hospital, Nevsehir, Turkiye

E-mail: sultanaozselcuk@hotmail.com

Abstract

Aim: Identifying cardiac and noncardiac causes is important in patients followed up in the emergency department for chest pain, shortness of breath, palpitation, syncope, and cardiopulmonary arrest. One noncardiac cause is pulmonary embolism. In this situation, troponin levels increase, as in cardiac causes, which is important for diagnosis. We aimed to retrospectively determine whether a correlation exists between troponin levels and embolism degree in blood samples obtained from patients with embolism.

Materials and Methods: This study is retrospective. Patients >18 years who had increased troponin levels and underwent pulmonary computed tomography angiography (PCTA) in the critical area of a training and research hospital between June 2020 and June 2022 were included in the study.

Results: Of the 274 patients included in our study, 45.3% were male. The most common presenting symptom (274 patients) was dyspnea (46.0%). Of the CT scans obtained for diagnostic purposes, 71.5% were interpreted as normal while the remainder showed positive embolism findings. Chest pain was lower in patients with high troponin levels (p=0.002). CT findings were more common in patients with low troponin levels (p=0.034). Chest pain was observed more frequently in discharged patients (p=0.029). The CT findings of the discharged patients were normal (p<0.001); bilateral, lobar, and segmental incidences were lower than those of the undischarged patients (p=0.022, p=0.003, p=0.037, and p<0.05, respectively).

Conclusion: No significant relationship was noted between troponin levels and embolism. No significant relationship was found between embolism diagnosis and hospitalization, although a significant relationship exists between age and increase in troponin level.

Keywords: Pulmonary embolism, D-dimer, troponin, pulmonary computed tomography angiography

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INTRODUCTION

Identifying cardiac and noncardiac causes is important in patients followed up in the emergency department for chest pain, shortness of breath, palpitation, syncope, and cardiopulmonary arrest. One noncardiac cause is pulmonary embolism (1).

Pulmonary embolism is divided into submassive and massive emboli. In this condition, troponin levels increase, as in cardiac causes, which is important for diagnosis (2).

Cardiac troponin T and I isoforms (cTnT and cTnI) are expressed in cardiac muscle tissue and are by far the most specific and sensitive indicators for the diagnosis of acute myocardial infarction (AMI) (3-6). Despite the high specificity of cTnT and cTnI, they are not ideal biomarkers for the diagnosis of AMI, since they elevate in blood serum not only in ischemic necrosis of myocardial cells, but also in a number of other pathologies that lead to damage or death of myocardial cells caused by non-ischemic factors.

This study retrospectively examined the significant increase in troponin levels using single-center retrospective data analysis in

a preliminary study conducted in patients diagnosed pulmonary embolism. If a positive correlation is noted between the troponin values of patients diagnosed with pulmonary embolism and the degree of embolism, this can be used to guide hospitalization/ follow-up and treatment of patients (7). Being more careful regarding the presence of additional fatal pathologies may be necessary in the absence of a correlation between troponin levels, which are frequently checked in emergency services, and non-cardiac cause like pulmonary embolism. We aimed to understand whether a correlation exists between troponin levels and the degree of embolism in blood samples of patients with embolism. Our study serves as a guide for future studies on this subject.

MATERIALS AND METHODS

This study is retrospective on patients who applied to the emergency department in a training and research hospital and underwent pulmonary computed tomography angiography (PBTA) with a preliminary diagnosis of pulmonary embolism (PE).

After taken 21.06.2023-227 protocol number of our ethics committee approval we started to collect patients. Patients who underwent PBTA between June 2020 and June 2022 were included in our study. Inclusion criteria for the study were: age >18 years, undergoing PBTA, tested for troponin and D-dimer, not being pregnant, and a complete file.

A total of 315 patients who underwent PBTA with a preliminary diagnosis of PE were identified. Fifteen of these patients had missing files, 18 were excluded because D-dimer had not been tested, and 8 had not been tested for troponin. In total, 274 patients who met all inclusion criteria were included in the study.

Since our study was retrospective, written informed consent was not obtained from the patients.

Statistical Analysis

Data were statistically analyzed using the SPSS 25.0 (IBM Corp, Armonk, NY) statistical software. Categorical measurements were summarized as numbers and percentages, and continuous measurements were presented as mean and standard deviation (median and minimum–maximum where appropriate). Categorical parameters were compared using Chi-square and Fisher's Exact acuity diagnostic tests. Whether the parameters in the study were normally distributed was determined using the Shapiro–Wilk test. The Mann–Whitney U test was used for parameters that did not show a normal distribution. The threshold for the first troponin value of the patients was set using ROC curve analysis. Statistical significance level was taken as 0.05 in all tests.

RESULTS

A total of 274 patients were included in our study, 45.3% of whom were male. The most common presenting symptom (n:274 patients) was dyspnea (46.0%). Of the CT scans obtained for diagnostic purposes, 71.5% were interpreted as normal, while the remainder showed positive embolism findings (Table 1).

Table 1. Demographic, outcome, symptom and vital parameters of the patients

		n	%
Gender	Male	67 (56.3)	67 (56.3)
	Woman	52 (43.7)	52 (43.7)
Symptoms	Chest pain	78	28.5
	Dyspnea	126	46.0
	Hemoptysis	21	7.7
	Syncope	44	16.1
	Arrest	One	0.4
CT finding	Normal	196	71.5
	Bilateral	6	2.2
	Lobster	10	3.6
	Segmental	5	1.8
	Subsegmental	5	1.8
Outcome	Discharge	126	46.0
	Admission/ Stamp embolism	34	12.4
	Admission/ Other	111	40.5
	Exitus	3	1.1
		Mean±SD	**Median (Min-Max)**
Age		61.6±19.8	64 (18-103)
Systolic blood pressuere (mmHg)		124.3±25.6	120 (75-233)
Diastolic blood pressuere (mmHg)		76.4±15.1	75.5 (34-126)
Pulse/ min		92.9±21.3	90 (55-200)
Respiratory rate		20.8±2.4	20 (16-37)
Saturation Pulse Oximeter (SPO2)		94.2±6.6	97 (60-100)
1. Troponin level		45.3±69.7	24 (3-735)
2. Troponin level		58.8±95.2	32 (0.9-900)
D-Dimer		2.8±3.2	1.66 (0.2-18)

SD: Standard Deviation

Chest pain was observed more frequently in discharged patients (p=0.029). The CT findings of the discharged patients were normal (p<0.001); bilateral, lobar, and segmental incidences were lower than those of the undischarged patients (p=0.022, p=0.003, p=0.037, and p<0.05, respectively) (Table 2). The mean age of patients who were discharged was lower (p=0.004) (Table 2). The mean heart rate, first troponin, second troponin, and D-dimer levels were lower in discharge patients than in those undischarged (p<0.001, p<0.001, p<0.001, and p=0.026, respectively) (Table 2).

Saturation pulse oximeter (SPO2) value was higher in the discharged patients (p<0.001) (Table 2). No significant differences were found between the other parameters (Table 2) and groups (p>0.05).

Table 2. Comparison of patients by outcome status

		Not Discharged (n=148) +	Discharge (n=126)	p
		n (%)	n (%)	
Gender	Male	70 (47.3)	54 (42.9)	0.462[a]
	Woman	78 (52.7)	72 (571)	
Symptoms	Chest pain	34 (23.0)	44 (34.9)	**0.029**[a]
	Dyspnea	74 (50)	52 (41.3)	0.148[a]
	Hemoptysis	13 (8.8)	8 (6.3)	0.450[a]
	Syncope	21 (14.2)	23 (18.3)	0.361[a]
	Arrest	1 (0.7)	-	0.355[a]
CT finding	Normal	91 (61.5)	105 (83.3)	**<0.001**[a]
	Bilateral	6 (4.1)	-	**0.022**[a]
	Lobster	10 (6.8)	-	**0.003**[a]
	Segmental	5 (3,4)	-	**0.037**[a]
	Subsegmental	4 (2.7)	1 (0.8)	0.239[a]
		Mean±SD	**Mean±SD**	
Age		64.6±19.8	58.0±19.2	**0.004**[b]
Systolic		124.9±26.9	123.5±24.1	0.931[b]
Diastolic		77.4±16.3	75.2±13.7	0.325[b]
Pulse		96.8±20.5	88.5±21.3	**<0.001**[b]
Respiratory rate		21.1±2.8	20.5±1.8	0.066[b]
SPO2		92.6±7.7	95.9±4.3	**<0.001**[b]
1. Troponin		58.5±86.3	27.8±30.2	**<0.001**[b]
2. Troponin		78.0±117.9	34.8±45.5	**<0.001**[b]
D-Dimer		3.37±3.7	1.88±1.6	**0.026**[b]

+: Non-discharged group: 34 patients with Admission/Pul emb, 111 patients with Admission/Other, 3 patients with exitus were included
[a]: Chi-square test and Fisher's Exact test, [b]: Mann-Whitney U test

Discharge status of the patients in study 1: The diagnostic test performance of troponin values is shown in Table 3. As a result of the analysis, the first troponin value of the patients showed 55.17% sensitivity and 73.28% specificity at a cut-off value of 19 (Figure 1) and below; the area under the curve was 0.676 and was statistically significant (p<0.001) (Table 3).

Table 3. Diagnostic value of 1. Troponin value according to discharge status

	1. Troponin
AUC 95%-CI (%)	0.676 (0.607-0.739)
Cut-off	<19.5
Sensitivity 95%-CI (%)	55.17 (44.1-65.9)
Specificity 95%-CI (%)	73.28 (64.3-81.1)
PPV 95%-CI (%)	60.8 (52-68.9)
NPV 95%-CI (%)	68.5 (62.7-73.8)
p	**<0.001**

Table 4. Comparison of patients by Troponin values

		Low Troponin (n=79)	High Troponin (n=14)	p
		n	%	
Gender	Male	42 (53.2)	49 (39.5)	**0.039**[a]
	Woman	37 (46.8)	75 (60.5)	
Symptoms	Chest pain	32 (40.5)	25 (20.2)	**0.002**[a]
	Dyspnea	36 (45.6)	62 (50.0)	0.538[a]
	Hemoptysis	5 (6.3)	5 (4.0)	0.461[a]
	Syncope	12 (15.2)	23 (18.5)	0.537[a]
	Arrest	-	1 (0.8)	0.424[a]
CT finding	Normal	62 (78.5)	80 (64.5)	**0.034**[a]
	Bilateral	-	5 (4.0)	0.071[a]
	Lobster	2 (2.5)	4 (3.2)	0.776[a]
	Segmental	2 (2.6)	2 (1.6)	0.637[a]
	Subsegmental	2 (2.5)	2 (1.6)	0.646[a]
Outcome	Discharge	48 (60.8)	39 (31.5)	**<0.001**[a]
	Admission/ Stamp emb	7 (8.9)	18 (14.5)	0.232[a]
	Admission/Other	26 (32.9)	63 (50.8)	**0.012**[a]
	Exitus	-	3 (2.4)	0.164[a]
		Mean±SD	**Mean±SD**	
Age		56.1±19.2	70.3±16.5	**<0.001**[b]
Systolic blood pressure		124.5±24.8	126.4±28.3	0.882[b]
Diastolic blood pressure		76.5±16.8	77.9±15.8	0.281[b]
Pulse/m,n		88.4±20.7	99.2±22.2	**<0.001**[b]
Respiratory rate		20.4±1.8	21.2±3.0	0.188[b]
SPO2		95.3±5.2	92.5±7.8	**0.003**[b]
D-Dimer		1.86±1.7	3.71±3.8	**0.001**[b]

[a]: Chi-square test and Fisher's Exact test, [b]: Mann-Whitney U test

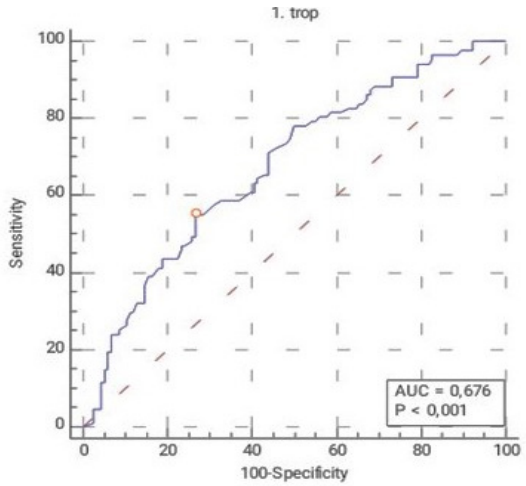

Figure 1. Examination of the 1. Troponin value by Roc curve test according to the discharge status of the patients

DISCUSSION

Pulmonary embolism is a reason of chest pain admitted patients to the emergency departments. Therefore, many blood tests and radiological imaging are performed in emergency services to diagnose patients with chest pain. Pulmonary embolism should be considered in the differential diagnosis of patients presenting with chest pain and can result in mortality when not diagnosed (8).

Many studies have investigated the relationship between high troponin levels and pulmonary embolism, and the prognosis is poor at high troponin levels (9). In another study by Mirambeaux et al., high troponin levels were shown to be a risk factor for PE (10). In our study, troponin elevation was found to be high in patients with poor prognosis, similar to that reported in the literature. This is because an increase in the pressure proximal to the emboli has a cardiac effect. Therefore, both troponin levels are elevated, and the prognosis worsens owing to cardiac involvement.

In a study conducted by Jalde et al., no significant increase in troponin levels or massive/submassive emboli was observed (11). In the study conducted by Hirai et al., troponin value increased significantly in patients with massive pulmonary embolism (12). In our study, patients with CT findings had low troponin levels. Therefore, we believe that troponin levels do not have a significant effect on determining the severity of embolism in CT findings.

In another study, no significant relationship was found between D-dimer positivity and embolism, suggesting that D-dimer negativity was significant after exclusion (13). Freund et al. showed that using the D-dimer test to correlate with the PERC score would be more beneficial for PE exclusion (14). In our study, the D-dimer levels were significantly lower in patients who were not diagnosed with PE. In addition, it was significantly lower in patients with low troponin levels. Therefore, we believe that the D-dimer test can be used as an exclusion criterion as described in the literature.

A review by Lippi et al. stated that the high-sensitivity cardiac troponin (hs-cTn) test could be used for the diagnosis of PE, especially in cases of cardiac involvement (15). Numerous studies have confirmed the prognostic significance of high-sensitivity troponin T (hsTnT) in acute PE and identified cutoff values describing high hsTnT concentrations (16,17). In addition, only one previous study used the high-sensitivity troponin I (hsTnI) test to diagnose PE (18). In our study, hsTnT level was used, which was found to be significantly higher in the diagnosis of PE. However, the specificity rate was low, and we believe that the specificity rate will increase in future prospective studies.

CONCLUSION

We believe that troponin level can be used as an auxiliary parameter in the diagnosis of pulmonary embolism, especially in emergency services, despite its low specificity. We predict that the troponin level will be more meaningful to determine and giving severity level to pulmonary embolism.

Limitations

The most important limitation of this study was its retrospective design. This was because the information of the included patients was difficult to obtain. The small number of patients included in the study was another limiting factor.

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Ethical approval: This study was approved by Başakşehir Çam and Sakura City Hospital Clinical Research Ethics Committee [Date: 21.06.2023 - No: 227]

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Original Article

Analysis of the Geriatric Forensic Cases Admitted to the Emergency Department

Gozde Cavumirza[1]
Omer Faruk Demir[2]
Secdegul Coskun Yas[3]

[1]Department of Emergency Medicine, Kayseri City Hospital, Kayseri, Turkiye
[2]Department of Emergency Medicine, Dışkapı Yildirim Beyazit Training and Research Hospital, Ankara, Turkiye
[3]Department of Emergency Medicine, Ankara Training and Research Hospital, Ankara, Turkiye

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Corresponding Author: Omer Faruk Demir, Department of Emergency Medicine, Dışkapı Yildirim Beyazit Training and Research Hospital, Ankara, Turkiye

E-mail: demirof@yahoo.com

Abstract

Aim: This study aims to make a demographic analysis of the geriatric forensic cases admitted to the emergency department, to reveal the reasons for the admission of forensic cases and the differences in the geriatric age groups, and to provide resources to create measures for the geriatric forensic cases with the results obtained.
Materials and Methods: The study was planned as a retrospective observational study at a tertiary care hospital, and geriatric forensic cases over the age of 65 who were admitted to the emergency department between January 2018 and December 2018 were included. Age, gender, reasons for admission, admission time, hospitalization, and death rates of the patients included in the study were recorded. Geriatric forensic cases were examined in three main groups: traumatic, non-traumatic, and suspicious deaths.
Results: During the study period, 208 patients aged 65 years and over were geriatric forensic cases. Of these cases, 64% were male, and the median age was 70. The most common reasons for admission were assault, followed by intoxication and simple falls. The highest admission rate was observed between 08:00-16:00. Of the patients, 14% were hospitalized, 6% underwent surgery and 13% died. It has been determined that the most common cause of mortality is falls.
Conclusion: In our epidemiological study, which should be evaluated within its own environmental factors, important results were obtained about the general reasons for admission and outcomes of geriatric forensic cases. With the data obtained, necessary precautions should be taken to reduce the mortality of geriatric forensic cases.

Keywords: Geriatrics, forensic medicine, emergency medicine

CITATION

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INTRODUCTION

Emergency departments are places where forensic cases are first admitted and where examination, diagnosis, and treatment are performed. Physicians working in the emergency department should know specific examination methods according to the characteristics of forensic cases (1). Geriatric forensic cases may present with many diseases accompanying aging. Possible difficulties in obtaining an adequate history make these cases even more important (2). With aging, homeostasis deteriorates over time and changes in cardiovascular, neurologic, hematologic, and musculoskeletal systems reduce reflex responses to stress and shock and this may result in morbidity and mortality (3). All these changes increase the risk of trauma such as falls or traffic accidents in the elderly. The accompaniment of chronic diseases with increasing age increases trauma-related mortality in the elderly compared to young people (4).

Worldwide, people aged 65 years and older are defined as elderly (5). Those aged 65-74 years are defined as young-old, those aged 75-84 years as middle-old, and those aged 85 years and older as old-old (6). The population of elderly people constitutes approximately 9-12% of the world population. This rate is expected to double by 2050 (7). In Turkey, the rate increased from 8% in 2014 to 8.8% in 2018 (8). Kehoe et al. showed that the rate of geriatric patients in trauma cases increased from 8% to 27% (9). In the study by Brooks et al., the rate of geriatric patients in trauma patients admitted to the emergency department increased from 14% to 20% (10).

With the increasing geriatric population, the number of geriatric cases presenting to the emergency department is expected to increase and the rate of geriatric population in forensic cases is also expected to increase. This study aims to make a demographic analysis of geriatric forensic cases admitted to the emergency

department, to reveal the reasons for the admission of forensic cases and the differences in geriatric age groups, and to provide resources to create measures for geriatric forensic cases with the results obtained.

MATERIALS AND METHODS

The study was planned as a retrospective observational study in a tertiary care hospital. Before starting the study, approval was obtained from the clinical research ethics committee (Number: 59/11, Date: 04.02.2019). All geriatric forensic cases over the age of 65 years were included in the study among all forensic cases admitted between January 1, 2018, and December 31, 2018. Geriatric patients other than forensic cases were not included in the study.

Forensic record information of the patients was evaluated retrospectively. Age, gender, reasons for admission, admission time, hospitalization, and death rates of the patients included in the study were determined. Geriatric forensic cases were examined in three main groups: traumatic, non-traumatic, and suspicious deaths. The traumatic group was analyzed under ten subheadings: traffic accidents, assaults, occupational accidents, stab wounds, falls from heights, simple falls, traumatic suicide, gunshot injuries, and others. The non-traumatic group was analyzed under three subheadings: neglect, intoxication, and non-traumatic suicides.

Statistical Analysis

Statistical analyses were performed using SPSS version 20 (IBM Corporation, Armonk, NY). The Kolmogorov-Smirnov test was used to determine the normal distribution of the data. Continuous data not conforming to normal distribution were expressed as median and min-max and categorical data were expressed as percentage (%). Mann-Whitney U test was used to compare data of two independent groups that did not conform to normal distribution. Chi-squared or Fisher's exact test was used to compare independent categorical variables, and $p<0.05$ was considered statistically significant.

RESULTS

During the one-year study, 208 (1.7%) of 12,150 patients aged 65 years and over were geriatric forensic cases. Of these cases, 64% were male, and the median age was 70 (65-94). The young-old group accounted for 68% of patients (Table 1). The median age of the females was higher than that of the males ($p = 0.011$). In the analysis of all forensic cases, assault was the most common reason for admission, accounting for 43.3% of cases, followed by intoxication (14.9%) and simple falls (14.4%) (Table 1).

The forensic cases were categorized into three groups: traumatic, non-traumatic, and suspicious death. Of the total cases, 165 (79.33%) were traumatic. The most frequent cause of traumatic cases was assault, accounting for 90 (54.55%) patients, while traffic and occupational accidents were the least common, each with only 1 (0.61%) patient. Upon analyzing the reasons for presenting non-traumatic cases, it was found that the most frequent cause was intoxication, with 31 (81.5%) patients, while neglect was the least common reason, with 3 (8%) patients. Additionally, there were 5 patients in the group of suspicious deaths. These patients were admitted with cardiac arrest, did not respond to cardiopulmonary resuscitation, and died, no information could be obtained from relatives and no diagnosis could be made.

Table 1. Patient characteristics, reason for admissions, and outcomes

	Total (n = 208)
Male gender, n (%)	133 (64)
Age, median (min-max)	70 (65-94)
Age group, n (%)	
Young-old	141 (68)
Middle-old	54 (26)
Old-old	13 (6)
Reason for admission, n (%)	
Assault	90 (43.3)
Intoxication	31 (14.9)
Simple fall	30 (14.4)
Stab wounds	13 (6.3)
Fall from height	12 (5.8)
Gunshot injury	10 (4.8)
Suspicious death	5 (2.4)
Others	4 (1.9)
Traumatic suicide	4 (1.9)
Non-traumatic suicide	4 (1.9)
Neglect	3 (1.4)
Work accidents	1 (0.5)
Traffic accidents	1 (0.5)
Patients undergoing surgery	12 (6)
Outcome, n (%)	
Discharge from ED	171 (82)
Hospitalization	29 (14)
Voluntarily leaving	8 (4)
Death	26 (13)

The patients were analyzed based on their admission times and months. The highest admission rate was observed between 08:00-16:00, with 101 (48.56%) patients, while the lowest admission rate was between 16:00-00:00, with 38 (18.27%) patients. July had the highest admission rate with 26 (12.5%) patients, while August and December had the lowest admission rates with 11 (5.29%) patients each (Figure 1).

Analysis of the hospitalization, surgical intervention, discharge, and final status of the forensic cases revealed that 14% of the patients were hospitalized, 6% underwent surgical intervention,

and 13% of the patients died (Table 1). Fifteen patients were admitted to the intensive care unit, 7 patients to orthopedics, 2 patients to thoracic surgery, 2 patients to ophthalmology, 1 patient to general surgery, 1 patient to cardiovascular surgery, and 1 patient to plastic surgery.

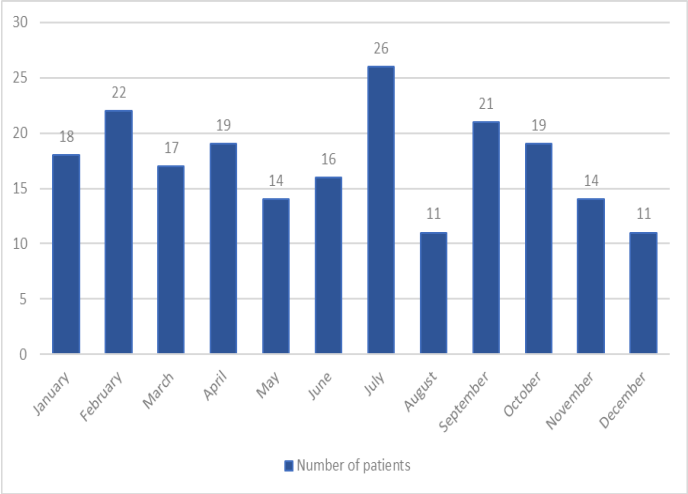

Figure 1. Distribution of patient admissions by months

When comparing the age, gender, and outcomes of traumatic and non-traumatic cases, it was found that the traumatic group had more males while the non-traumatic group had more females. This difference was statistically significant (p=0.008). There were no differences between the groups in terms of age, or outcome (Table 2).

Table 2. Comparison of traumatic, non-traumatic and young-old, middle-old and old-old groups

	Traumatic cases (n = 165)	Non-traumatic cases (n = 38)	p
Age, median (min-max)	70 (65–94)	72 (65–94)	0.310[a]
Male gender, n (%)	112 (68)	17 (45)	0.008[b]
Mortality, n (%)	17 (10)	4 (10)	1.000[b]
	Young-old (n = 141)	**Middle-old and Old-old (n = 67)**	
Male gender, n (%)	96 (68)	37 (55)	0.071[b]
Traumatic cases, n (%)	117 (84)	48 (75)	0.120[b]
Mortality, n (%)	11 (8)	15 (22)	0.003[b]

[a]: Mann-Whitney U test, [a]: Chi-squared or Fisher's Exact test

Due to the small number of patients in the old-old group, the middle-old and old-old groups were merged to provide a comparison by age group. When comparing the gender, reason for admission, and outcome information of the young-old, middle-old, and old-old groups, it was found that the mortality rate was significantly higher in the middle-old and old-old groups compared to the young-old group (p=0.003). No significant differences were found between the groups in terms of other parameters (Table 2).

In the analysis of the reasons for admission of the dead patients, it was found that the most common reason for admission was a fall, which was the case in 10 patients (38.5%) (Table 3).

Table 3. Reasons for admission of dead patients

Reason for admission	Total (n = 26)
Simple fall	10 (38.5)
Suspicious death	5 (19)
Fall from height	5 (19)
Gunshot injuries	2 (7.5)
Intoxication	2 (7.5)
Non-traumatic suicide	1 (4)
Neglect	1 (4)

DISCUSSION

This observational study of geriatric forensic cases analyzed the demographics and presentation reasons of 208 cases. The percent of males was higher in the traumatic forensic case group, while the percent of females was higher in the non-traumatic group. The traumatic group was the majority among the forensic cases. It was found that the most common reason for admission in all forensic cases was assault. In the study group, mortality increased with age, and falls were the most common cause of mortality. Our findings were largely consistent with previous studies in the literature.

In a study by Küçük et al. examining the demographic characteristics of all forensic cases, the rate of the geriatric population was found to be 6% (11). In another study by Türkmen et al. evaluating all forensic cases, the rate of the geriatric population was found to be 5.5% (12). It was found that 1.7% of the forensic cases aged 18 years and older admitted to the emergency department of our hospital in 1 year were aged 65 years and older. In the study conducted by Timur et al, the rate of young-old was reported as 54.6%, middle-old as 34%, and old-old as 11.27% (4). In our study of geriatric forensic cases, the proportion of young-old was 68%, the proportion of middle-old was 26%, and the proportion of old-old was 6%.

Many studies evaluating forensic cases presented to the emergency department have found a higher rate of males compared to females (11-15). In a study by Seviner et al, this rate was found to be 64% (12). In our study, similar to the literature, the rate of male patients was found to be 64% and it was found to be higher than that of females. The fact that men are more likely to have high-risk behavior in social life compared to women may explain why the majority of forensic cases were men.

In our study, when the cases were classified as traumatic and non-traumatic cases according to the reasons for presentation, the rate of female patients in non-traumatic cases was 55% higher than that of males. Similarly, in the study by Seviner et al. it was

reported that when forensic cases were classified according to the reason of presentation, the majority of patients presenting with non-traumatic reasons were women (12).

In the study by Demircan et al., 46.6% of the cases were reported between 16:00-00:00 and 42% between 08:00-00:00 according to the time of presentation (14). In our study, the highest number of admissions was found between 08:00-16:00 with 48.56%. In the majority of the studies conducted in Turkey, the highest number of forensic case applications was in July (11, 13, 15-17). In our study in which geriatric forensic cases were examined, similar to other studies, the highest number of applications was found in July at 12.5% and the lowest number of applications was found in December and August at 5.29%.

In a study by Demircan et al. in which all age groups were analyzed, the most common reason for admission was traffic accidents with 43%, the other reasons were assault at 19%, suicide attempt at 17%, and CO intoxication at 7%, respectively. In the same study, falling ranked seventh with 2.6% (14). In a study by Rittenhouse et al. in which geriatric trauma patients were evaluated, the most common reason for admission was reported as falls at 77% and the second most common reason was motor vehicle accidents at 16.5% (18). Similarly, in another study conducted by Seviner et al., the most common reason for admission was traffic accidents, with intoxication in the second place and assault in the third place (12). In a study by Kandiş et al. evaluating forensic trauma cases in the geriatric age group, 46% of the cases were traffic accidents and 44% were assault cases (16). In a study by Durak et al. in which geriatric trauma patients were examined, 65.7% were assault, 27.1% were motor vehicle accidents and these were followed by stabbing and cutting injuries (19). In a study by Bilgin et al. evaluating geriatric forensic cases, 58% of the cases were falls, 28% were traffic accidents, 5% were intoxication and 4% were assault cases (20). In studies evaluating geriatric forensic cases, significant changes are observed in the reasons for admission according to the regions where the study was conducted. In our study, the most common reason for admission among all forensic cases was assault with a rate of 43.3%. The second most common reason was intoxication with 14.9% and the third most common reason was falls with 14.4%. We think that the higher-than-expected rate of assault in our study is related to the socio-cultural structure of the region where our hospital is located.

In a study by Kormaz et al. examining forensic cases over the age of 18 admitted to the emergency department, it was observed that 69% of the patients were discharged as outpatients with simple medical intervention, 26% were hospitalized and 0.3% died, and most of the patients were hospitalized in the orthopedics service (21). In the study of Seviner et al., 73% of the patients were discharged, 26% were hospitalized and 0.3% died (12). In the study by Bilgin et al. in which forensic cases in the geriatric age group were evaluated, 44% of the patients were discharged as outpatients, 56% were hospitalized, 12.4% died, and the most common hospitalization was in the orthopedic service with 24% (20). In the study by Hung et al. mortality rate was found to be 7.5% in trauma patients aged 55-70 years and 17% in patients over 70 years (22). In light of all these studies, it was observed that mortality was higher in geriatric forensic cases compared to young people. In our study, 82% of the patients were treated as outpatients with simple medical intervention, 14% were hospitalized and the most common hospitalization was in the orthopedic service. In our study, mortality rate was 13%. The mortality rate was 8% in the young-old and 22% in the middle-old and old-old group and it was shown that mortality was associated with increasing age in geriatric forensic cases.

In the study by Demircan et al. and the study by Seviner et al., the most common causes of death were traffic accidents and falls from height (12-14). In our study, the most common cause of death was found to be falls with 38.5%. Contrary to the literature, we think that the reason why the most common cause of mortality was falls is because falls are more common than traffic accidents in geriatric forensic case presentations due to regional differences in our study.

In the geriatric patient population, many causes can directly or indirectly lead to geriatric forensic cases. Many of these causes can be reduced with simple interventions. In our study, we think that measures should be taken to prevent falls, which are the most common cause of mortality. We believe that the quality of life of elderly patients will be improved and the morbidity and mortality resulting from accidents will be reduced by organizing the home, removing items that can cause tripping, placing cabinets and shelves at a height that can be easily reached, using assistive devices for individuals who have difficulty walking, and providing education to family members who live together.

CONCLUSION

In our study, it was observed that most of the patients were in the young-old group and were male. The proportion of males was higher in the traumatic forensic case group and the proportion of females was higher in the non-traumatic group. The traumatic group was predominant among forensic cases. Contrary to the literature, we found that the most common reason for admission in all forensic cases and traumatic forensic cases was assault. In the geriatric age group, mortality increased with increasing age and the most common cause of mortality was falls. Many factors play a role in the etiology of forensic cases in the geriatric patient population. Many of these factors are preventable with simple measures to be taken. We think that examining forensic cases admitted to emergency departments and developing a strategy according to the results will make a positive contribution to the approach to these patients.

Limitations

Since the subject of our study is highly influenced by environmental and cultural factors, its single center was the biggest limitation of the study. However, the analysis of regional data provides important contributions to this subject. Thus,

we think that each hospital and region will be more prepared according to the characteristics of geriatric forensic cases admitted to them. Since the study was planned retrospectively, it was not possible to detail the data as much as desired. In addition to the mechanisms of injury, examining the diagnoses of the patients would have yielded more valuable results. We found that mortality was associated with increased age; however, since other factors that may affect mortality (comorbidity, medications, etc.) were not examined, we cannot say that age is an independent factor affecting mortality.

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Case Report

A Rare Case; Aortic Root Abscess and Aortic Valve Dehiscence in a Patient with Mechanical Aortic Valve Replacement Who Presents to the Emergency Department with Dyspnea and Fever

Gurbuz Meral[1]
Serkan Gunay[1]
Ahmet Ozturk[1]
Osmancan Gunes[1]
Hasan Ozden[1]
Abdullah Sarihan[1]
Ali Kemal Erenler[1]

[1]Department of Emergency Medicine, Erol Olcok Education and Research Hospital, Hitit University, Corum, Turkiye

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Corresponding Author: Gurbuz Meral, Department of Emergency Medicine, Erol Olcok Education and Research Hospital, Hitit University, Corum, Turkiye

E-mail: drgrbzmeral@gmail.com

Abstract

Infective endocarditis (IE) is a medical condition with high mortality (1). Aortic root abscess is one of the complications of IE and may develop mostly in patients with mechanical valve replacement and may cause dehiscence of the aortic valve (2). Patients may present to the emergency department with nonspecific symptoms such as fever (3)
In a patient with a history of mechanical heart valve replacement presenting with fever, when clinical findings and laboratory findings do not fully coincide with any diagnosis other than IE, IE should be tried to be excluded by echocardiography. When IE diagnosis cannot be made or IE cannot be excluded with transthoracic echocardiography (TTE), if there is still suspicion, transesophageal echocardiography (TEE) should be performed (5).
The case we will talk about is a 67-year-old male patient who applied to the emergency department with complaints of hemoptysis, shortness of breath and fever, and was diagnosed with mechanical aortic valve dehiscence by TTE. The patient was admitted to the intensive care unit and the presence of abscess in the aortic root was detected in the subsequent TEE. Patient was referred to an advanced center for surgical treatment. It was learned that he died on the 2nd postoperative day.

Keywords: Infective endocarditis, dehiscence, mechanical heart valve, echocardiography

CITATION

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INTRODUCTION

Surgical aortic valve replacement (SAVR) is a widely used method in the treatment of heart valve disorders worldwide (6). As a SAVR complication, IE is a dangerous condition with a high mortality rate (2). The diagnosis of IE is primarily based on clinical suspicion and modified Duke criteria (5). Prosthetic aortic valve endocarditis accounts for 1-6% of all prosthetic valve IE cases and the overall mortality rate is approximately 25% despite medical intervention (7,8).

TEE which complements TTE findings, is a critical diagnostic tool for suspected IE cases (9). Paravalvular aortic abscess is one of the serious complications of IE with high morbidity and mortality rates (10). The preferred treatment method for aortic root abscesses is surgery (10).

In this case report, we are talking about a 67-year-old male patient who applied to the emergency department with fever, dyspnea and hemoptysis, had a history of mechanical prosthetic aortic valve replacement and was diagnosed IE with complication of aortic root abscess.

CASE REPORT

A 67-year-old male patient with a history of type 2 diabetes mellitus, hypertension, and congestive heart failure was

admitted to the emergency department with had been going on for three days complaints of hemoptysis, shortness of breath and fever. From his medical history, it was learned that he had mechanical aortic valve replacement surgery 2 months ago due to symptomatic bicuspid aortic valve and aortic aneurysm. He has been using warfarin since the surgery. At the first evaluation, the patient's general condition was moderate, slightly tachypneic, blood pressure 150/90 mmHg, heart rate 120 beats/min, oxygen saturation 94% on room air, body temperature 38.1 ºC. On physical examination, S1 and S2 heart sounds were positive. Parameters with significant abnormalities in laboratory evaluations: WBC 24.03 -300), ProBNP 34298 pg/mL(0-125), Procalcitonin 0.810 ng/mL(0-0.5), INR 7.3. The patient's ECG was in normal sinus rhythm, slightly tachycardic, and there was no ST elevation or depression.

Non-contrast thorax CT showed bilateral 2 cm pleural effusion and widespread ground glass opacities in both lungs. In the patient who complained of fever and dyspnea, acute phase reactants were detected to be increased in laboratory tests. An infectious focus was not detected in the patient, for whom infectious diseases consultation was performed. Then cardiology consultation was requested for the patient, whose troponin values were found to be high in the laboratory, with the preliminary diagnosis of IE. TTE that performed by the cardiologist, it was reported that the aortic valve was clearly separated from its attachment site. Afterwards, cardiovascular surgery consultation was performed and the patient was admitted to the cardiovascular surgery intensive care unit for treatment.

Transesophageal echocardiography was performed to the patient during intensive care admission; It was reported that a 27x16 mm paravalvular abscess and opening of the aortic valve adjacent to the interatrial septum were detected. The report also stated that vegetation was detected on the ventricular surface of the aortic valve and on the left atrium side of the mitral valve anterior leaflet.

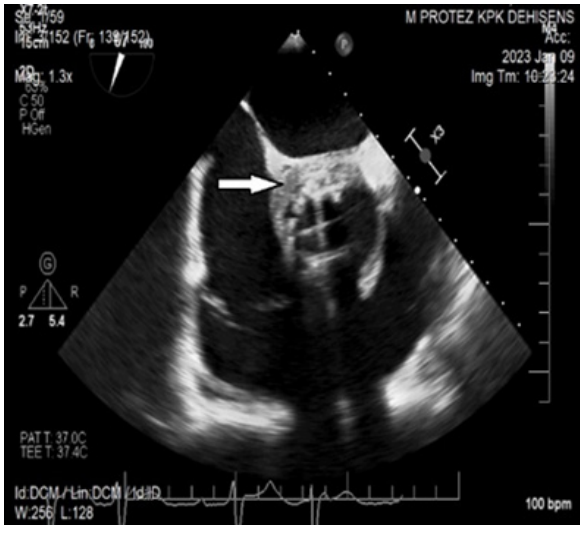

Figure 1. Cauliflower-like mass protruding into the left atrium

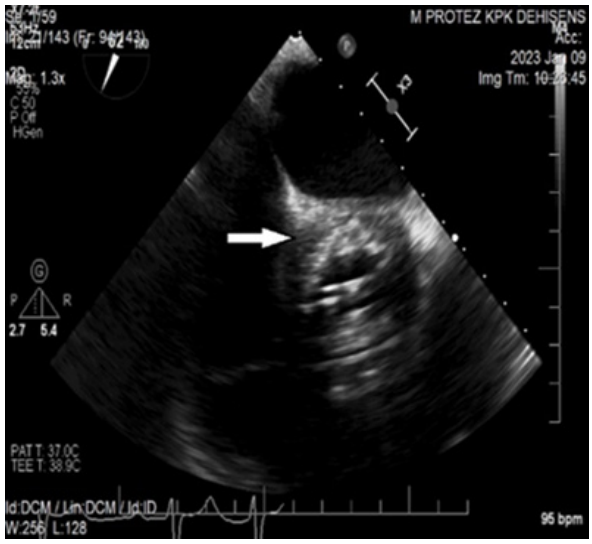

Figure 2. Paravalvular abscess appearance

After that the patient was referred to an advanced center for surgical treatment by the cardiovascular surgery department. According to the information received from the center he died on the 2nd day after surgery.

DISCUSSION

Infective endocarditis is defined as infection of heart valves (natural or prosthetic), mural endocardium, and intracardiac devices (permanent pacemakers and/or defibrillators) (10). Modified Duke Criteria are used for the diagnosis of IE (7). The diagnosis is made by the presence of 1 major and 1 minor criterion or the presence of 3 minor criteria (4) . Major criteria are briefly collected under two main headings: positive blood culture and findings compatible with endocarditis in imaging methods (7). Minor criteria for IE are: predisposing cardiac diseases or intravenous drug use, fever >38°C, vascular symptoms, immunological symptoms, microbiological evidence (7).

In the case we presented, there were symptoms and clinical findings suggestive of an infection process, such as fever, tachycardia, increased white blood cell count and shortness of breath. However, there was no focus of infection in the detailed physical examination, radiological imaging or urinalysis to explain this situation. At initial examination, our patient did not meet the IE minor criteria other than fever and predisposing cardiac disease (mechanical valve replacement). However, the absence of a focus of infection that would explain the elevated white blood cell count and fever, as well as the history of mechanical valve replacement, made us suspicious of IE. Echocardiography plays a very important role in the diagnosis of IE and is the imaging method of first choice (8). So cardiology consultation was requested for the patient, who also had elevated troponin levels, and TTE was planned.

In the case we presented, it was determined by TTE that the mechanical valve was separated from its attachment site. After

that cardiovascular surgery consultation was requested and our patient was admitted to intensive care. This situation reminded us that we should keep the diagnosis of IE in mind in a patient who has undergone mechanical valve replacement, even if only one of minor criteria are met. It also showed that an IE complication such as valve dehiscence should also be a possibility.

In the case we presented, decomposition of the mechanical valve was detected by TTE, but abscess and vegetation could only be detected by TEE performed after the disease. This is an indication that TEE is complementary to TTE or superior to TTE, especially in patients with mechanical prosthetic valves (5).

CONCLUSION

The diagnosis of IE should always be kept in mind in a patient who has undergone mechanical valve replacement and comes to the emergency department with a complaint of fever. If an infective focus cannot be detected or if the suspected infective focus does not fully match the clinical and laboratory findings TTE should be performed as the first imaging method for diagnosis, and if possible TEE should be performed along with or after it. In a disease with such high mortality, early diagnosis and appropriate treatment are vital in improving patient outcomes.

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Case Report

Bilateral Anterior Shoulder Dislocation Due to a Simple Fall: Case Report and Overview of Reduction Techniques

Secdegul Coskun Yas[1]
Omer Faruk Demir[2]

[1]Department of Emergency Medicine, Ankara Training and Research Hospital, Ankara, Turkiye
[2]Department of Emergency Medicine, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Ankara, Turkiye

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Corresponding Author: Secdegul Coskun Yas, Department of Emergency Medicine, Ankara Training and Research Hospital, Ankara, Turkiye

E-mail: secdecoskun@gmail.com

Abstract

Bilateral anterior shoulder dislocations, though uncommon, require prompt recognition and intervention. We report a case of a 29-year-old male who presented with bilateral anterior shoulder dislocations following a simple fall. The patient had a history of recurrent dislocations in both shoulders. Reduction was achieved using scapular manipulation for the left shoulder and traction-countertraction for the right. Post-procedure, successful reduction was confirmed, and neurovascular examinations were normal. Literature review indicates diverse mechanisms for bilateral anterior shoulder dislocations, emphasizing the rarity of this condition. The choice of reduction techniques is crucial, with scapular manipulation proving effective in our case. This report highlights the importance of early intervention, the utilization of diverse reduction techniques, and the need for emergency physicians to be proficient in various reduction techniques for managing such rare and challenging cases.

Keywords: Shoulder dislocation, emergency medicine, orthopedics

CITATION

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INTRODUCTION

Shoulder dislocations hold a significant place among orthopedic emergencies presenting to the emergency department (1). Shoulder dislocations, which have the highest incidence among the major joint dislocations, can occur anteriorly, posteriorly and inferiorly (2). Although anterior dislocations are the most frequent, bilateral dislocations are rarely seen. In contrast to unilateral dislocations, posterior dislocations occur more frequently in bilateral cases (3).

Early intervention in shoulder dislocations is an absolute necessity to prevent neuromuscular damage and permanent shoulder ligament damage (4). Anterior shoulder dislocations are frequently seen in the emergency department and reduction can be performed by both emergency physicians and orthopedists. There are numerous reduction techniques developed for shoulder dislocations (4).

In presenting a case of bilateral anterior shoulder dislocation following a simple fall, we aim to highlight a rare condition after minor trauma in the emergency department and review applicable reduction techniques.

CASE REPORT

A 29-year-old man presented to the emergency department after tripping while walking and falling on his hands. The patient complained of limited movement and pain in both shoulders. Vital signs were within normal limits. The patient had a history of three dislocations in the right shoulder and two in the left shoulder. Additionally, the patient did not have any other medical conditions. Examination revealed restricted shoulder joint movements, normal pulses, and no neurovascular deficits. Both shoulders exhibited an epaulet sign. There were no significant findings in other system examinations. X-rays confirmed dislocations in both glenohumeral joints (Figure 1).

Reduction was planned under sedoanalgesia. The patient was closely monitored and was given 20 mg of ketamine and 20 mg of propofol. The left shoulder was successfully reducted by the emergency medicine specialist using the scapular manipulation technique. After one shoulder was reducted, the Spaso technique was attempted for the right shoulder to avoid prone positioning

of the patient, but a successful reduction was not achieved. After that, the right shoulder was reducted using the traction-countertraction technique. Post-reduction neurovascular examination of both upper extremities was normal. The patient was consulted with orthopedics, and Velpeau bandages were applied to both shoulders. The patient, discharged without complications, was advised orthopedic outpatient follow-up due to the history of recurrent dislocations.

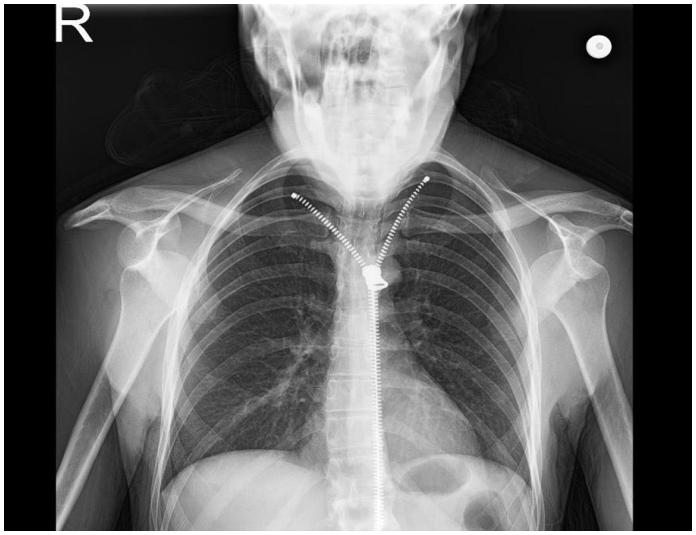

Figure 1. Patient's radiographic examination showing anterior dislocation of both shoulders

DISCUSSION

Anterior shoulder dislocations typically occur as a result of forcing the arm during abduction and external rotation (5). The majority of these dislocations develop as a result of trauma. The most common injury related to anterior dislocations is axillary nerve injury. Other complications include axillary artery injury, ligament injuries, and fractures.

Reviewing cases of bilateral anterior shoulder dislocation in the literature, both traumatic and non-traumatic causes, including muscle contraction, are observed (6, 7). The reported cases have shown various mechanisms, including seizure, electric shock, traction injury, and fall (8, 9). Traumatic bilateral anterior shoulder dislocations often occur due to strain in abduction and external rotation, similar to unilateral anterior dislocations. However, the reason why bilateral dislocations are rare is that both extremities must be exposed to similar mechanisms and similar forces (10). In the case presented, the patient experienced a traumatic mechanism by falling on their hands. The patient's previous recurrent shoulder dislocations may have caused the damage that led to bilateral dislocation resulting from a simple fall. In a case presented by Ballesteros et al. bilateral anterior shoulder dislocation was observed in a patient who fell on his hands with a similar mechanism (7).

Reduction of shoulder dislocations should be performed rapidly, as the difficulty of reduction increases over time due to neurovascular complications and muscle spasms (11). Therefore, reductions should be carried out in the emergency department by emergency physicians or orthopedic specialists. The use of sedoanalgesia before reduction is recommended, and detailed neurovascular examination should be performed before and after each attempt. Several reduction techniques are described for anterior glenohumeral dislocations (12-15).

In our case, one shoulder was reduced by scapular manipulation. When the Spaso technique, which was the first technique tried for the other shoulder, failed, reduction was performed with the traction-countertraction technique. Scapular manipulation involves placing the patient prone, applying weight or traction to the dislocated extremity towards the ground. The hands are then placed on the scapula and the inferior end of the scapula is pushed medially (12). In the Spaso technique, with the patient supine, the arm is vertically tractioned, and external rotation is applied (8). The traction countertraction technique applies traction to the arm in abduction while the patient is supine and countertraction is applied by an assistant with a sheet wrapped crosswise on the chest under the axilla (15).

Numerous studies have compared closed reduction methods in the literature. In a review by Alkaduhibi et al., scapular manipulation was found to be the most successful and rapidly applied technique (1). Traction-countertraction, Spaso technique, and FARES method were also shown to be successful techniques after scapular manipulation, respectively. In the meta-analysis by Dong et al. no significant difference was found between the techniques in terms of success rate (16). The meta-analysis suggests that technique selection should be individualized based on the patient.

CONCLUSION

Bilateral anterior shoulder dislocations are rare occurrences that should be kept in mind even after simple mechanisms. The treatment is similar to unilateral shoulder dislocations. There are various reduction methods available for physicians to use based on their knowledge and experience. It is important for the physician performing the procedure to be qualified to apply multiple techniques in case the initial method is unsuccessful.

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Informed Consent: Written consent was obtained from the patient.

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