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Changes in Acute Coronary Syndrome Clinic after the Devastating Earthquake in Türkiye

ABSTRACT

Background: We aimed to investigate the clinical and angiographic characteristics of patients with acute coronary syndrome (ACS) who survived this devastating earthquake and were admitted to our hospital in Antakya/Türkiye.

Methods: We retrospectively examined the impact of the earthquake on the occurrences of acute coronary syndromes in Antakya/Türkiye. All 248 consecutive patients with ACS, also survivors of the earthquake in Antakya, were enrolled as the earthquake group. The earthquake group was created from patients hospitalized between February and June in 2023 after the earthquake. In total, 209 consecutive ACS patients who were hospitalized in our cardiology clinic in similar months of 2022 named as the control group.

Results: Patients admitted before the earthquake were more hospitalized with multi-vessel disease compared to after the earthquake group ($P < .001$). Myocardial infarction with non-obstructive coronary artery disease (MINOCA) was the main reason for the significant increase rate of ACS after the earthquake. The earthquake patient group had lesser diabetes mellitus than the control group ($P < .001$). The risk of men suffering from ACS after an earthquake is approximately 2.1 times higher than women ($P = .023$). Those with a history of revascularization are approximately 1.8 times more likely to have ACS after an earthquake ($P = .05$). The risk of experiencing ACS after an earthquake is approximately 3.5 times higher for those with a family history than for those without ($P < .001$).

Conclusion: Effects of the devastating earthquake on the heart are the increase in MINOCA patients triggered by great sudden environmental stress and the decrease in diabetes due to worsening nutritional conditions, respectively.

Keywords: Acute coronary syndrome, earthquake, environmental stress, myocardial infarction with non-obstructive coronary artery disease

INTRODUCTION

Acute coronary syndrome (ACS) is one of the most prominent cardiovascular diseases (CVD) and often the first presentation of all CVDs. Typical presentation and further management vary based on electrocardiographic (ECG) and clinical findings; unstable angina, non-ST-elevation myocardial infarction (NSTEMI); and ST-elevation myocardial infarction (STEMI).[1] Plaque rupture/erosion is the major pathophysiological trigger of all ACSs. Many factors play a role until this final process develops; inflammatory factors and endothelial dysfunction, which precede cardiovascular risk factors. Stress is one of these traditional cardiovascular (CV) risk factors and can be triggered in any condition that disturbs patient comfort (either emotional factors or environmental factors).[2] Besides being a CV risk factor, stress factor increases the association and frequency of other CV risk factors (hypertension, diabetes mellitus, obesity, etc.).[3]

Stressors are emotional or environmental factors; psychiatric disorders, socioeconomic disruption, natural disasters, etc., and each of these carries a potential risk for the destabilization of life and the expected outcome of ACS (plaque rupture/erosion).[4] On February 6, 2023, a natural disaster, a massive earthquake, which took place in Türkiye killed thousands of people. However, survivors suffered from stress factors and the social and clinical consequences of the disaster. One of these clinical consequences may be CV deterioration. We aimed to investigate the

ORIGINAL INVESTIGATION

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clinical and angiographical characteristics of patients with ACS who were the survivors of this earthquake and admitted to our hospital and cardiology clinic in Antakya/Türkiye.

METHODS

Study Population

The study was carried out in a single center. We retrospectively examined the effect of the earthquake on the formation of acute coronary syndrome in Antakya/Türkiye. All 248 consecutive ACS patients who survived the earthquake in Antakya were recorded as the earthquake group. The earthquake group was composed of patients who were hospitalized between February and June 2023 after the earthquake. 209 consecutive ACS patients who were hospitalized in our cardiology clinic in similar months of 2022 were called the control group.

Patients who did not have ACS, who did not undergo coronary angiography, who were not hospitalized in the mentioned months, and who were suspected of having myocardial damage (post-earthquake injury, etc.) were excluded from the study. We did not use any artificial intelligence (AI)-assisted technologies (such as Large Language Models [LLMs], chatbots, or image creators) in the production of submitted work. Written informed consent was not sought for the present study because it is currently a retrospective study.

Acute Coronary Syndrome and Coronary Intervention

ACS was defined under 4 categories: unstable angina, NSTEMI, STEMI, and myocardial infarction with non-obstructive coronary artery disease (MINOCA). Acute coronary syndrome was diagnosed according to the guidelines.[5,6]

The Killip classification of the patients was recorded to show the hemodynamic status.[7]

Coronary angiography and percutaneous coronary intervention were performed by Philips X-Ray and Cardiovascular Systems (Philips Medical Systems Nederland B.V.). The standard Judkins technique via the femoral/radial (left or right) approach was used by experienced interventional cardiologists. The femoral approach was used more than the radial approach in the before and after the earthquake groups. The SYNTAX score was calculated using angiographic analysis of coronary lesions with ≥50% diameter stenosis in vessels with a minimum diameter of ≥1.5 mm defined by a computer program that examines total occlusion, bifurcation, trifurcation, distal vascular bed, thrombus formation, etc. The SYNTAX score was calculated before wiring or pre-dilatation of the infarct-related artery. SYNTAX 2 score was calculated after calculating SYNTAX score and adding more information (age, creatinine clearance, peripheral disease, etc.).[8]

No-reflow was defined as TIMI grade 0, 1, and 2 flows, or TIMI grade 3 with a myocardial blush grade (MBG) of 0 or 1.[9]

Diagnosis of Diabetes Mellitus

According to the American Diabetes Association (ADA), diabetes mellitus is defined as fasting plasma glucose ≥7 mmol/L (≥126 mg/dL) or HbA1c ≥ 6.5% (48 mmol/mol) or 2-hour plasma glucose ≥ 11.1 mmol/L (200 mg/dL) during an oral glucose tolerance test (75 g glucose) or in a patient with classic symptoms of hyperglycemia in a random plasma glucose ≥11.1 mmol/L (200 mg/dL).[10]

Statistical Analysis

SPSS 20.0 statistical analysis program (Armonk, NY: IBM Corp) was used for all statistical analysis. Chi-square test was used to compare categorical variables between the groups. Student's *t*-test or Mann–Whitney U-test was used to compare continuous variables between 2 groups, depending on whether the statistical hypotheses were met. The normality of distribution for continuous variables was confirmed with the Kolmogorov-Smirnov test. Univariate analysis was performed to assess the association between acute coronary syndrome after the earthquake and the possible risk factors including age, SYNTAX score, GENSINI score, LDL, diabetes, mortality, and complications. Logistic regression analysis was used for assessing the effect of acute coronary syndrome after the earthquake. Categorical variables were expressed as numbers and percentages, whereas continuous variables were summarized as mean and standard deviation and as median and IQR (25^{th}, 75^{th}) when appropriate. The statistical level of significance for all tests was considered to be 0.05.

RESULTS

Demographic Analysis

Table 1 shows the demographical characteristics of groups. Risk factors were similar other than diabetes mellitus, family history, body mass index (BMI), and stress factors of earthquake. After the earthquake group had a lesser diabetes mellitus rate than the control group ($P < .001$). Figure 1 shows that the control group had a lesser family history rate than after the earthquake group ($P < .001$). Body mass index of patients after the earthquake was higher than the patients admitted before the earthquake ($P = .003$).

Comparison of ACS symptoms before and after the earthquake is shown in Table 2. It has been found that individuals differ in terms of ACS types. While approximately half of the before the earthquake group had STEMI findings, the STEMI rate of the after the earthquake group was 44.4%. Myocardial infarction with non-obstructive coronary artery

HIGHLIGHTS

- The occurrences of overall acute coronary syndromes were significantly increased after the earthquake in Antakya/Türkiye compared to 5 months of the previous year.
- Patients hospitalized before the earthquake had more severe coronary artery disease according to SYNTAX I-II and GENSINI scores.
- The devastating earthquake and great environmental stress triggered the development of MINOCA and the decrease in diabetes mellitus due to worsening nutritional conditions.

Table 1. Comparison of Demographic Characteristics of Patients in Group 1 and Group 2

	Group 1 (n = 209) $\chi \pm$ SS/n (%)/ median (IQR)	Group 2 (n = 248) $\chi \pm$ SS/n (%)/ median (IQR)	*P*
Age (years)	62.59 ± 11.68 61 (56-72)	60.44 ± 11.66 60 (52-68.75)	.051
Gender			
Female	62 (29.7)	55 (22.2)	.068
Male	147 (70.3)	193 (77.8)	
BMI (kg/m^2)			
Normal	25 (12.0)	32 (12.9)	**.003**
Overweight	167 (79.9)	169 (68.1)	
Obese	17 (8.1)	47 (19.0)	
Family history			
Absent	174 (83.3)	160 (66.1)	**<.001**
Present	35 (16.7)	82 (33.9)	
DM			
Absent	122 (59.2)	183 (75.3)	**<.001**
Present	84 (40.8)	60 (24.7)	
HT			
Absent	79 (38.0)	98 (40.3)	.611
Present	129 (62.0)	145 (59.7)	
LDL (mg/dL)	105.93 ± 45.87 105 (72.25-130.75)	99.77 ± 30.42 100.5 (79.0-121.0)	.104
CABG			
Absent	202 (96.7)	234 (96.3)	>.999
Present	7 (3.3)	9 (3.7)	
Smoking			
Yes	102 (50.0)	102 (50.0)	0.188
Quit	15 (36.6)	26 (63.4)	
Never	92 (43.4)	120 (56.6)	
Alcohol			
Absent	189 (90.4)	230 (94.7)	0.103
Present	20 (9.6)	13 (5.3)	
Regular physical activity/sport			
Present	2 (1.0)	1 (0.4)	0.598
Absent	207 (99.0)	242 (99.6)	

Group 1: patients who admitted before the earthquake; Group 2: patients who admitted after the earthquake. Values in bold indicate statistical significance.
BMI, body mass index;CABG, coronary artery bypass greft;, DM, diabetes mellitus; HT, hypertension.

disease was the leading subtype of ACS that increased after the earthquake. A significant statistical difference was detected between the groups in terms of coronary stenosis percentage, left ventricular ejection fraction (LEVF), occluded vessel feature, revascularization history, and OAD usage ($P < .05$). Patients were more hospitalized with multivessel disease before the earthquake than after the earthquake ($P < .001$). Additionally, individuals with ACS who were hospitalized after the earthquake had lower SYNTAX 1 (Figure 2), SYNTAX 2, and GENSINI scores, and these scores were statistically different between the groups ($P < .05$).

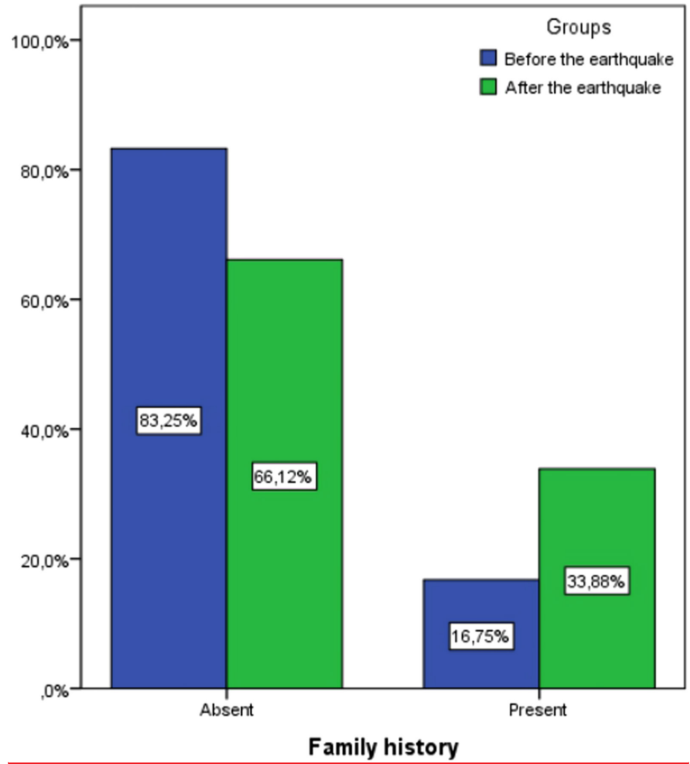

Figure 1. Ratio of family history of acute coronary syndrome was higher in after the earthquake group.

In-hospital mortality and morbidity rates of the after the earthquake group were lower and statistically different than the before the earthquake group ($P < .05$). After the earthquake, the number of referred patients to an external center after coronary angiography/percutaneous coronary intervention with ACS was more than the control group, and this rate was found to be statistically different between the groups ($P < .05$).

Night shift procedures were higher in after the earthquake group, but they were not statistically significant ($P = .074$). Although mortality was higher in hospital night shift procedures (3.2% and 8.7% on-hours and off-hours, respectively), the result was borderline significant ($P = .057$).

Predictors of Acute Coronary Syndrome After Earthquake

Logistic regression analysis is shown in Table 3. After the earthquake, the risk of ACS was approximately 2.7 times higher in men than in women ($P = .002$). The risk of experiencing ACS after the earthquake was approximately 4.1 times higher in those with a family history than in those without ($P < .001$). A 1-unit decrease in eGFR increases the risk of experiencing ACS after the earthquake approximately 1.02 times ($P = .002$). A 1-unit increase in BMI increases the risk of experiencing ACS after the earthquake approximately 1.2 times ($P = .001$).

DISCUSSION

In this retrospective study, we revealed the clinical and angiographic characteristics of ACS patients in the acute phase of the devastating earthquake that occurred in Antakya/

Table 2. Comparison of Clinical Features of Patients in Group 1 and Group 2

	Group 1 (n = 209) $\chi \pm$ SS/n (%)/ median (IQR)	Group 2 (n = 248) $\chi \pm$ SS/n (%)/ median (IQR)	*P*
ACS			
Unstable angina	22 (10.5)	24 (9.7)	**.004**
NSTEMI	82 (39.2)	93 (37.5)	
STEMI	103 (49.3)	110 (44.4)	
MINOCA	2 (1.0)	21 (8.5)	
Baseline GCS	14.74 ± 1.50 15 (15-15)	14.88 ± 1.11 15 (15-15)	.273
SBP (mm Hg)	125.93 ± 19.85 125 (112.5-140)	127.39 ± 16.41 126 (118-139)	.391
DBP (mm Hg)	75.99 ± 12.58 75 (67-84)	77.23 ± 11.15 77.5 (70-84)	.264
Score of KILLIP			
1	185 (88.5)	220 (89.4)	.840
2	17 (8.1)	21 (8.5)	
3	6 (2.9)	4 (1.6)	
4	1 (0.5)	1 (0.4)	
EF (%)	42.38 ± 11.15 45 (35-50)	48.20 ± 9.89 50 (40-55)	**<.001**
Stenotic vessel			
>1	114 (54.5)	77 (31.0)	**<.001**
RCA	23 (11.0)	39 (15.7)	
CX	16 (7.7)	27 (10.9)	
LAD	43 (20.6)	60 (24.2)	
Other	13 (6.2)	45 (18.1)	
Access site			
Femoral/radial	197 (95.2)/10 (4.8)	228 (93.4)/16 (6.6)	.665
Procedure time*			
On-hours	161 (77.8)	177 (72.2)	.074
Off-hours	46 (22.2)	68 (27.8)	
Revascularization history			
Absent	174 (83.3)	177 (72.8)	**.009**
Present	35 (16.7)	66 (27.2)	
HG (g/dL)	13.275 ± 2.31 13.5 (11.73-14.90)	12.77 ± 2.09 13 (11.85-14.0)	**.007**
eGFR (mL/min/1.73 m^2)	77.15 ± 27.28 84 (63-96.4)	76.41 ± 22.16 77.42 (61-92.2)	.127
PCI			
Absent	50 (23.9)	76 (31.3)	.093
Present	159 (76.1)	167 (68.7)	
CABG			
Absent	201 (96.2)	229 (94.2)	.387
Present	8 (3.8)	14 (5.8)	
TIMI flow score			
0	9 (4.3)	5 (2.1)	.171
1	7 (3.3)	5 (2.1)	
2	12 (5.7)	24 (10.2)	
3	181 (86.6)	202 (85.6)	
SYNTAX 1 score	14.17 ± 7.96 13 (8-21)	12.36 ± 7.13 11.5 (7-17)	**.040**
SYNTAX 2 score	33.71 ± 13.64 31.4 (22.9-43.1)	29.73 ± 11.35 29.35 (20.27-39.62)	**.008**
GENSINI score	60.52 ± 35.08 56 (32-80)	50.59 ± 29.40 41 (32-66)	**.001**
Slow flow/no reflow			
Absent	184 (88.5)	199 (87.3)	.770
Present	24 (11.5)	29 (12.7)	
Complication			
None	140 (67.3)	193 (83.2)	**.001**
Arrhythmia	23 (11.1)	23 (9.9)	
CIN	23 (11.1)	7 (3.0)	
Bleeding	11 (5.3)	3 (1.3)	
CVA	1 (0.5)	0 (0.0)	
Stent restenosis	1 (0.5)	0 (0.0)	
Pulmonary edema	9 (4.3)	6 (2.6)	
In-hospital mortality			
Absent	192 (91.9)	226 (97.8)	**.004**
Present	17 (8.1)	5 (2.2)	
Anticoagulation			
None	202 (97.6)	240 (98.0)	.474
Warfarin	5 (2.4)	3 (1.2)	
Rivaroxaban	0 (0.0)	1 (0.4)	
Apixaban	0 (0.0)	1 (0.4)	
Post-discharge mortality (1 year)			
Absent	170 (89.0)	214 (92.2)	.508
Cardiac	18 (9.4)	15 (6.5)	
Non-cardiac	3 (1.6)	3 (1.3)	

(*Continued*)

Group 1: patients who were admitted before the earthquake; Group 2: patients who were admitted after the earthquake. Values in bold indicate statistical significance.
*On-hours: Monday-Friday 7:00 AM-4:59 PM; off-hours: Monday-Friday 5:00 PM-6:59 AM, Saturday, Sunday, and nonworking holidays.
ACS, acute coronary syndrome; CABG, coronary artery bypass greft; CIN, contrast-induced nephropathy; CVA, cerebro-vascular accidents; DBP, diastolic blood pressure; DM, diabetes mellitus; eGFR, estimated glomerular filtration rate; GCS, glasgow coma scale; HT, hypertension; LDL, low-density lipoprotein; NSTEMI, non-ST elevated myocardial infarction; PCI, percutaneous coronary intervention; SBP, systolic blood pressure; STEMI, ST elevated myocardial infarction.

Türkiye in 2023. We also compared these patients with ACS patients in similar months in the previous year. Insights from previous results were as follows:

- The occurrences of overall acute coronary syndromes were significantly increased after the earthquake in Antakya/Türkiye compared to similar months of the previous year.

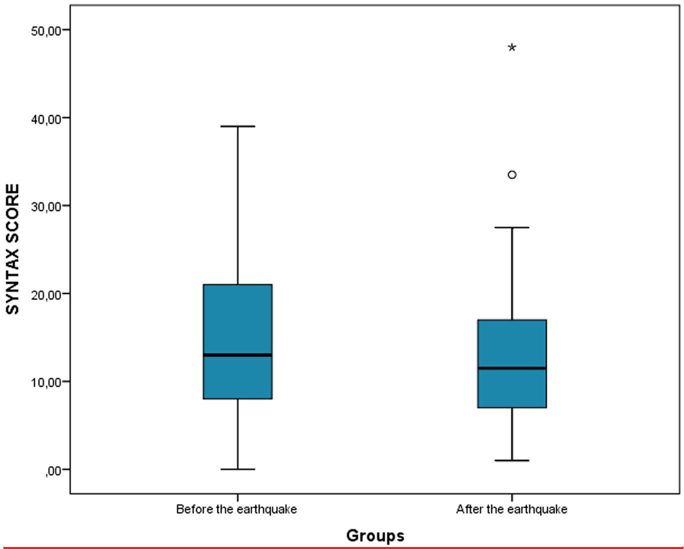

Figure 2. Ratio of SYNTAX 1 score was higher in before the earthquake group.

- Patients hospitalized after the earthquake had more MINOCA, rather than obstructive epicardial coronary arteries.
- Patients hospitalized before the earthquake had more severe coronary artery disease according to SYNTAX I-II and GENSINI scores.
- Diabetes mellitus ratio was lower in after the earthquake group.

Coronary vascular diseases (CVDs) are the most common non-communicable diseases and the global burden of all-cause morbidity and mortality all around the world.[11]

There are several modifiable risk factors associated with cardiovascular outcomes (obesity, hypertension, diabetes, smoking, hyperlipidemia), and these risk factors can be scored with various scoring systems.[12]

Acute coronary syndrome develops under the influence of these risk factors added to fatty streaks and atherosclerosis, which begin at an early age.[13] Acute coronary syndrome is a preventable, although unpredictable, heart disease. Besides the classical risk factors (hypertension, diabetes, smoking, sedentary life, etc.), emotional stress and sudden environmental effects (air pollution, interpersonal conflicts, traffic chaos, natural disasters, etc.) are also stressors on coronary arteries and myocardium. Emotional stress can increase the major cardiovascular events 2-fold and cannot be evaluated by contemporary risk scores.[2,14-16]

Environmental stress, inevitable natural disasters (earthquake, tsunami, etc.) have previously been reported to be associated with potential cardiovascular disease risk. Acute stress triggered after an earthquake initiates sympathetic activation and further pathways of acute coronary syndrome.[17] Acceleration of acute stress-onset events after an earthquake disaster causes activation of the sympathetic and renin–angiotensin–aldosterone systems, increased blood pressure–heart rate, and increased oxygen consumption and requirement. The resulting vascular plaque rupture can cause myocardial damage (acute coronary syndrome, heart failure, cardiac arrest etc.), multiorgan involvement (cerebral infarction, pulmonary embolism, etc.), and sudden cardiac death.[18] Following the 9.0 magnitude earthquake in Japan in 2011, the authors reported increased acute coronary syndrome, stroke, sudden cardiac death, and heart failure. They compared the results with the previous 3 years.[19]

Suzuki et al[20] published the results of acute myocardial infarction (AMI) patients after the earthquake that occurred in their regions. They reported that there was an increase in the number of patients with AMI (often caused by left anterior descending artery occlusion) especially in the first week of the earthquake. They also reported similar results for coronary artery risk factors (hypertension, diabetes, smoking, body mass index). Their conclusion was that increased acute emotional stress induced acute myocardial infarction.

In our study, we compared the results with the previous 5 months of 2022. We observed a statistically significant increase in the number of ACS patients after the earthquake. This increase rate was mostly seen in the MINOCA patients. In addition, unlike before the earthquake group, the majority of our patients' coronary angiographic results consisted of single vessel culprit lesion. The pathophysiological features of MINOCA were defined as coronary atherosclerosis,

Table 3. Univariate and Multiple Analysis of the Potential Risk Factors in Group 1 and Group 2

	Univariate Analysis		Multiple Analysis	
	OR (95% CI)	***P***	**OR (95% CI)**	***P***
Age	1,019 (0.991-1.048)	0.182	–	–
Gender	2.379 (1.245-4.550)	0.009	2.780 (1.469-5.260)	.002
Complication	0.698 (0.391-1.246)	0.224	–	–
In-hospital mortality	0.224 (0.053-1.120)	0.070	–	–
Family history	4.163 (2.316-7.486)	<0.001	4.075 (2.331-7.123)	<.001
eGFR	1.024 (1.010-1.037)	0.001	0.983 (0.972-0.994)	.002
BMI	1.232 (1.086-1.397)	0.015	1.213 (1.081-1.360)	.001
SYNTAX 2 score	0.967 (0.935-1.000)	0.058	–	–
GENSINI score	0.993 (0.984-1.002)	0.118	–	–

ACS, acute coronary syndrome; BMI, body mass index; eGFR, estimated glomerular filtration rate.

plaque erosion (especially in women), vasospasm, spontaneous dissection, thromboembolism.[21] These events, occurring in the absence of critical vascular occlusion (coronary lesion <50%), lead to reduced coronary blood flow/decreased myocardial perfusion and myocardial infarction diagnosed as MINOCA.[22]

A recently published multicenter study emphasized that the incidence of stress-induced ACS is higher in women than in men and revealed that increased emotional stress was more likely to be associated with myocardial infarction with obstructive coronary artery disease rather than MINOCA.[23]

On the contrary, in our study, the rate of male hospitalizations was higher in both the ACS and MINOCA patient groups. Additionally, our results showed a significant increase in the number of admissions of MINOCA patients after the devastating earthquake, a stressful natural event. These results suggest that the effects of a devastating earthquake on the heart are different from emotional stress. A huge stressful event may have concluded as single culprit lesions and plaques rather than disseminated vascular disease. In fact, our after the earthquake group consists of more patients with single-vessel disease and lower SYNTAX I-2 and GENSINI scores compared to before the earthquake patients.

In addition, the fact that our results in after the earthquake group consisted mostly of non-diabetic patients may explain that a devastating earthquake may have different effects contrary to expectations. We suggested that this downward trend in diabetic patients is linked to the earthquake victims' accommodation problems, difficulty of receiving food and influential factors. These patients were experiencing severe emotional stress due to the destruction of their homes or the death of their relatives. Although some previous reports showed impaired glycemic control in patients with diabetes following a natural disaster, more recent studies reported that the HbA1c of patients with diabetes improved 3 months after the earthquake.[24]

Kondo et al[25] reported that the glycemic control of patients with diabetes was seriously damaged due to the 2016 Kumamoto earthquake. In patients with type 2 diabetes, HbA1c initially decreased by 0.11% 1-2 months after the earthquake compared to before the earthquake, and increased 3-4, 6-7, and 12-13 months after the earthquake.[25,26]

We argued that this decrease was associated with a reduced eating routine. Additionally, inadequate or disturbed sleep and circadian dysregulation can have a negative impact on glycemic control in patients with diabetes.[27]

Another controversial issue is that periprocedural complications (arrhythmia, contrast-induced nephropathy, cerebrovascular accidents, stent restenosis, pulmonary edema, etc.) were different between the before and after the earthquake groups. The post-earthquake group appears to be less affected by complications during the procedure. This result was due to the decrease in the number of patients with contrast nephropathy and bleeding after the earthquake. In fact, this may be due to the fact that the referral chain worked very intensively and quickly in the early period after the earthquake, and patients who underwent coronary angiography/revascularization were referred to hospitals outside the city earlier.

The absence of coronary perforation complication in our patients is probably due to the relatively small number of patients. A multicenter study involving 344 517 patients revealed a small rate (0.58%) of coronary perforation during 4-year follow-up after coronary revascularization procedures. The authors reported that coronary perforations were more common during the procedure in patients who underwent saphenous vein graft revascularization, chronic total occlusion procedure, and rotational atherectomy.[28] However, in our study, the rate of patients with a previous history of coronary bypass was relatively low, our study consisted of patients with acute coronary lesions, and we did not perform atherectomy during ACS.

Like complication rates, in-hospital mortality rates were also found to be lower in the after the earthquake group. The reason for this situation may be the rapid patient referral chain we just mentioned. However, in our study, no significant difference was detected between the groups in the 1-year follow-up of post-discharge mortality. A previous study reported an association between lower mortality rates and higher operator volume.[29]

In terms of post-discharge mortality rates, we did not confirm a significant relationship between operator volume and mortality rates in both the before and after the earthquake groups (3% was the 1-year mortality rate of per operator).

Tokarek et al[30] reported the effect of STEMI procedures performed during and outside working hours on complications and mortality rates. The results showed similar complication rates between procedure times, but increased mortality for procedures performed off-hours. Similarly, we did not observe any effect of night shift procedures on complications during the procedure. We observed that in-hospital mortality rates increased, although not significantly, in procedures performed during the night shift. The results might have been different if more patients were included in the study.

The lack of OCT and IVUS usage in this study constitutes a limitation, especially in terms of MINOCA diagnosis. Since there was a terrible density of trauma patients in our center after the earthquake, some of procedures may have been performed based on external center laboratory tests (troponin, etc.). Moreover, some of the patients were first diagnosed at an external center and transferred to our center. We retrospectively scanned our study results from the system and patient files. This information may have been obtained from the system and the results delivered during emergency referral. The density of trauma patients admitted immediately after the earthquake and the inability to transport some materials to the angiography laboratory due to chaos may have increased the limitations.

CONCLUSION

In summary, the effects of the devastating earthquake on the heart are the increase in MINOCA patients triggered by major environmental stress and the decrease in diabetes cases due to worsening nutritional conditions.

Ethics Committee Approval: Ethics committee approval of the study was received by the Mustafa Kemal University Non-invasive Ethics Committee on July 26, 2023 (decision number: 5).

Informed Consent: Written informed consent was not sought for the present study because it is currently a retrospective study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – O.A., E.O.; Design – O.A., Ö.B.; Supervision – G.A., E.O.; Resources – V.E., R.Y.; Materials – R.F.D., F.Ş.; Data Collection and/or Processing – G.A., O.A., F.Ş.; Analysis and/or Interpretation – O.A., H.B., G.A.; Literature Search – F.Ş., Ö.B., V.E., R.Y., R.F.D.; Writing – O.A., G.A.,H.B.; Critical Review – E.O., H.B.

Declaration of Interests: The authors have no conflicts of interest to declare.

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