

Research Article

Depression in Patients with Atrial Fibrillation

Tarik Kivrak, Ozkan Karaca, Mehmet Ali Kobat, Mehmet Balin, Ilgin Karaca

Department of Cardiology, Firat University, Elazig, Turkey

Abstract

Objectives: Depression is related to poor clinical outcomes in patients with cardiovascular diseases like heart failure. However, we have no data demonstrating the association between depression and atrial fibrillation (AF).

Methods: A total of 54 patients with AF and 52 patients without AF were enrolled in our study. Depression scores were assessed in 2 groups. Demographic and clinical information were recorded.

Results: The mean age of the 2 groups was 61.94 ± 9.49 years and 60.29 ± 8.25 years, and 28% and 27% were female in the respective groups. In patients with AF, the depression score was higher than in the other group (19.7 ± 1 vs. 10.1 ± 2.3 ; $p < 0.001$). The depression score was univariate and multiple linear regression analysis showed predictors for atrial fibrillation ($0.999 [0.998-1.000]$; $p = 0.002$; $0.999 [0.998-1.000]$ $p = 0.007$). The depression scale for predicting AF was determined to be 16.48, with 73% sensitivity and 61% specificity (area under the curve: 0.701; 95% confidence interval: 0.582–0.819).

Conclusion: The depression score was higher in patients with AF, and it appears that there is an association between depression and AF. Depression may be a risk factor for AF.

Keywords: Atrial fibrillation, depression, quality of life

Atrial fibrillation (AF) is the most common heart rhythm disorder, affecting 3–6 million in the US, including 5% people over age 60.^[1, 2] Thereby the aging of the US population, the number of people diagnosed with AF is anticipated to more than double by the year 2050.^[1, 3] AF is related to a higher risk of all-cause mortality, stroke, cardiovascular mortality, cardiac events, and heart failure.^[4] The enhanced prevalence of AF has significant personal, clinical, and socioeconomic implications, in part because patients with AF often also have impaired cognitive function.^[4, 5] Furthermore, the depressive mood has been shown to be more common among patients with AF and Psychological distress is often present among patients diagnosed with AF.^[6, 7] Our study is investigated to the association between AF and depression in the outpatients.

Methods

This study was performed using personal information of the patient at Firat University. Beck's depression scale assessed the degree of depression of the people who came to cardiology polyclinic in two groups. The groups were separated as with AF or not. 54 patients with atrial fibrillation (AF) and 52 patients without AF enrolled in our study. The people who are taking any antidepressant before excluded for increasing the specificity and sensitivity of our research. Relevant cardiac medications, echocardiography and electrocardiographic properties of the patients recorded in our trial. Depression was classified as minimal depression (0-9 point), mild depression (10-16 point), moderate depression (17-29 point) and severe depression (30-63 point). Statistical analyses were

Address for correspondence: Tarik Kivrak, MD. Firat Universitesi, Kardiyoloji Anabilim Dalı, Elazig, Turkey

Phone: +90 505 372 99 45 **E-mail:** tarikkivrak@gmail.com

Submitted Date: March 16, 2018 **Accepted Date:** April 09, 2018 **Available Online Date:** May 15, 2018

©Copyright 2018 by Eurasian Journal of Medicine and Investigation - Available online at www.ejmi.org



performed using SPSS 16.0 statistical package for Windows. Continuous data were expressed as a mean±standard deviation, while categorical data presented as percentages. The χ^2 test was used for comparison of categorical variables, while student t-test or Mann-Whitney U test was used to compare parametric and nonparametric continuous variables, respectively. Kolmogorov-Smirnov test assessed normal distribution. Pearson or Spearman's correlation test practiced correlation analysis. Logistic regression analysis was practiced to determine the independent predictors of depression. Receiver operating characteristic (ROC) curve analysis was practiced to determine the cut-off level of depression score predict the AF. A p-value of <0.05 was considered statistically significant.

Results

One hundred six patients were included in the study and classified two groups based on within or without AF. 54 patients had AF. The LA Diameter is statistically significant longer (46 ± 3.4 mm vs. 38 ± 2.2 mm $p<0.001$) in AF group than the other one. Also, using increased beta-blockers, calcium channel blockers and digoxin was statistically significant in the patients with AF (Table 1). Laboratory measurements of the study patients were not statistically significant between two groups. On the other hand, depression score was statistically significant high in AF group (19.7 ± 1.8 vs. 10.1 ± 2.3 $p<0.001$) (Table 2). Depression score is univariate and multiple linear regression analysis showing the predic-

Table 1. Baseline clinical characteristics of the study population

Variable	Patients with AF (n=54)	Patients without AF (n=52)	P
Age, years	61.94±9.49	60.29±8.25	0.187
BMI, kg/m ²	30.03±5.67	30.09±4.99	0.989
Female, n	28	27	0.622
Systolic blood pressure, mm Hg	136.48±7.35	135.66±10.87	0.843
Diastolic blood pressure, mm Hg	84.65±6.36	84.60±9.53	0.973
Diabetes mellitus, n	24	22	0.298
Current smoking, n	15	13	0.362
Dyslipidemia, n	22	20	0.246
CAD, n	18	14	0.086
LVEF, %	48.92±10.86	50.82±8.89	0.096
LA diameter, mm	46±3.4	38±2.2	<0.001
B bloker use, n	24	14	<0.001
Ca blocker use, n	16	9	<0.001
Digoxin use, n	11	2	<0.001
Statin use, n	16	14	0.244

BMI - body mass index; LVEF - left ventricular ejection fraction; LA - left atrium; CAD - coronary artery disease.

Table 2. Depression Score and Biochemical/Hematological measurements of the study patients

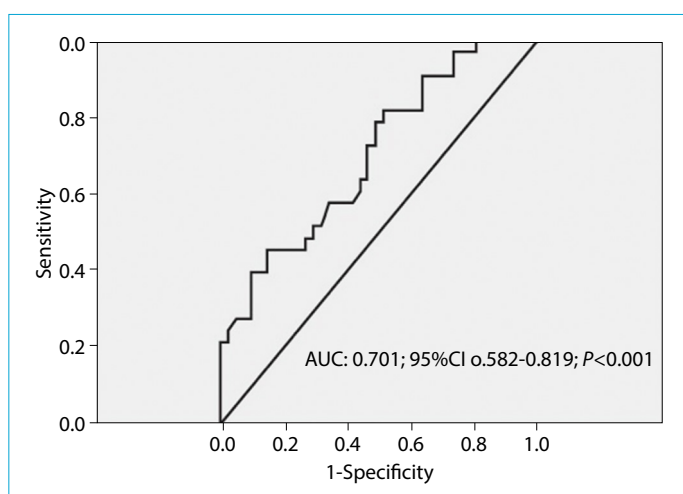
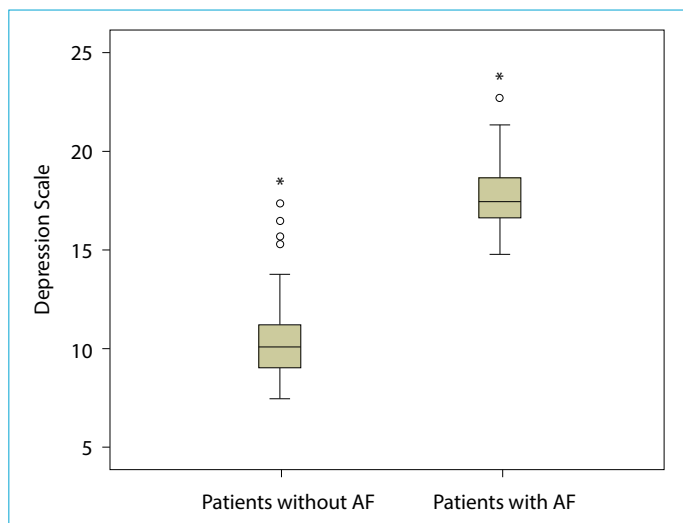
Variable	Patients with AF (n=54)	Patients without AF (n=52)	P
WBC count, x10 ⁹ /L	9.20±2.15	8.99±2.12	0.094
Platelet count, x10 ⁹ /L	238.91±70.66	248.83±74.45	0.787
Hemoglobin, g/dL	13.79±1.63	13.82±1.76	0.494
Serum glucose, mg/dL	151.92±72.33	131.08±47.76	0.234
Creatinine, mg/dL	0.99±0.26	1.12±0.78	0.234
Total cholesterol, mg/dL	199.71±49.03	188.44±55.27	0.237
HDL mg/dL	47.65±12.56	46.18±10.11	0.246
LDL mg/dL	118.96±42.78	112.18±45.09	0.215
Triglyceride, mg/dL	174.84±113.24	150.76±91.30	0.479
Hs-CRP, mg/L	2.02±0.81	1.96±1.23	0.248
Glomerular filtration rate, mL/min/1.73 m ²	75.31±17.10	76.64±20.21	0.706
Depression Score	19.7±1.8	10.1±2.3	<0.001

HDL - high-density lipoprotein; hs-CRP - high sensitivity C-reactive protein; LDL - low-density lipoprotein; WBC - white blood cell.

Table 3. Univariate and multiple linear regression analysis showing the predictors of atrial fibrillation

Variables	Univariable OR (95% CI)	P	Multivariable OR (95% CI)	P
Hs-CRP	1.874 (1.179–2.979)	0.220	1.901 (0.910–2.971)	0.67
Depression Score	0.999 (0.998–1.000)	0.002	0.999 (0.998–1.000)	0.007
Left ventricle EF	1.019 (0.972–1.077)	0.446	–	–
Dyslipidemia	0.896 (0.383–2.244)	0.466	–	–
White blood cell	1.091 (0.883–1.349)	0.419	–	–
Smoking	1.744 (0.712–4.272)	0.224	–	–
HDL cholesterol	1.002 (0.991–1.055)	0.378	–	–

CI - confidence interval; OR - odds ratio; EF - ejection fraction; hs-CRP - high sensitive C-reactive protein; HDL - high density lipoprotein.

**Figure 1.** ROC Curve: Sensitivity and specificity of the depression score for predicting**Figure 2.** Association between AF and Depression Scale

tors for atrial fibrillation (0.999 (0.998–1.000) p :0.002; 0.999 (0.998–1.000) p :0.007). The depression score for predicting AF found as 16.48, with 73% sensitivity and 61% specificity (AUC 0.701, 95% CI 0.582–0.819) (Table 3) (Fig. 1) (Fig. 2).

Discussion

Here, we found a clear association between the group with AF and depression degree. The similarity in age and female gender ratio supported the study to be more statistically significant. As known, great depression prevalent is correlated with increased age and female gender. Depression or anxiety have been demonstrated to affect up to one-half of patients with AF,^[5] and in this patient group are at a 2-fold higher risk of cognitive impairment than same-aged patients without AF.^[8] Thus, the rates of depression observed in our study were remarkably similar to those reported in prior. Depression and anxiety are broad in patients with AF^[5, 8]; they are also common in other chronic cardiovascular pathologies. In a significant consensus, mood and cognition are becoming recognized for their role in the risk, management, and prognosis; including in the context of AF.^[9, 10] The increased sympathetic nervous system is involved in AF^[11], and this is the mechanism that might be related to the role of anxiety in influencing AF.^[12] The age of patients is another critical variable because we know that older the patient higher the risk of incidence of AF^[13], and age needs to be taken into consideration in the implementation of psychological research as well. But, in our study, the two groups have similar gender rate and period. Because of this factor, we think that there can be a correlation between atrial fibrillation and depression. Depression may be a risk factor for atrial fibrillation. The existing of depression on the people with AF makes heavy weather of intervention and treating AF. We believe that in virtue of this study and similarities will create awareness about that treating AF is a complicated and multidisciplinary approach. Further studies are needed to replicate these analyses and to further test the relationship between AF and their related characteristics with longitudinal study designs.

Limitations:

Our trial is an observational study; results can only show associations between AF with depression. First, all of the

patients in our study had not an emergency or urgency AF symptoms and just stable patients with AF identified from cardiology policlinics, so our findings may not be generalizable to all off AF patients.

Conclusion

Our findings suggest that psychosocial impairments are common among patients with AF. The psychological approach may help guide patients, families, and physicians inappropriate screening and making informed AF treatment decisions.

Disclosures

Ethics Committee Approval: The study was approved by the Local Ethics Committee.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship contributions: Concept – T.K.; Design – T.K.; Supervision – I.K.; Materials – O.K.; Data collection &/or processing – O.K.; Analysis and/or interpretation – T.K.; Literature search – M.A.K.; Writing – O.K., T.K.; Critical review – M.B.

References

- Go AS, Hylek EM, Phillips KA, Chang Y, Henault LE, Selby JV, et al. Prevalence of diagnosed atrial fibrillation in adults: national implications for rhythm management and stroke prevention: the Anticoagulation and Risk Factors in Atrial Fibrillation (ATRIA) Study. *JAMA* 2001;285:2370–5. [\[CrossRef\]](#)
- Steinberg JS. Atrial fibrillation: an emerging epidemic? *Heart* 2004;90:239–40. [\[CrossRef\]](#)
- Naccarelli GV, Varker H, Lin J, Schulman KL. Increasing prevalence of atrial fibrillation and flutter in the United States. *Am J Cardiol* 2009;104:1534–9. [\[CrossRef\]](#)
- Kim MH, Johnston SS, Chu BC, Dalal MR, Schulman KL. Estimation of total incremental health care costs in patients with atrial fibrillation in the United States. *Circ Cardiovasc Qual Outcomes* 2011;4:313–20. [\[CrossRef\]](#)
- Thrall G, Lip GY, Carroll D, Lane D. Depression, anxiety, and quality of life in patients with atrial fibrillation. *Chest* 2007;132:1259–64. [\[CrossRef\]](#)
- McCabe PJ. Psychological distress in patients diagnosed with atrial fibrillation: the state of the science. *J Cardiovasc Nurs* 2010;25:40–51. [\[CrossRef\]](#)
- von Eisenhart Rothe AF, Goette A, Kirchhof P, Breithardt G, Limbourg T, Calvert M, et al. Depression in paroxysmal and persistent atrial fibrillation patients: a cross-sectional comparison of patients enrolled in two large clinical trials. *Europace* 2014;16:812–9. [\[CrossRef\]](#)
- Kwok CS, Loke YK, Hale R, Potter JF, Myint PK. Atrial fibrillation and incidence of dementia: a systematic review and meta-analysis. *Neurology* 2011;76:914–22. [\[CrossRef\]](#)
- Lichtman JH, Bigger JT Jr, Blumenthal JA, Frasure-Smith N, Kaufmann PG, Lespérance F, et al. Depression and coronary heart disease: recommendations for screening, referral, and treatment: a science advisory from the American Heart Association Prevention Committee of the Council on Cardiovascular Nursing, Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Interdisciplinary Council on Quality of Care and Outcomes Research: endorsed by the American Psychiatric Association. *Circulation* 2008;118:1768–75. [\[CrossRef\]](#)
- Lane D, Carroll D, Ring C, Beevers DG, Lip GY. The prevalence and persistence of depression and anxiety following myocardial infarction. *Br J Health Psychol* 2002;7:11–21. [\[CrossRef\]](#)
- Shen MJ, Zipes DP. Role of the autonomic nervous system in modulating cardiac arrhythmias. *Circ Res* 2014;114:1004–21.
- Borghi L, Galli F, Vegni EAM. The patient-centered medicine as the theoretical framework for patient engagement. In: Grafigna G, editor. *Promoting patient engagement and participation for effective healthcare reform*. Hershey: IGI Global; 2016. p. 25–39.
- Dewland TA, Olgin JE, Vittinghoff E, Marcus GM. Incident atrial fibrillation among Asians, Hispanics, blacks, and whites. *Circulation* 2013;128:2470–7. [\[CrossRef\]](#)