

Case Report

A palpable depression

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ABSTRACT

Several studies have shown that patients with depression, anxiety and stress have a higher ratio in developing atrial fibrillation (AF), with higher proportion occurring in patients with recurrent episodes of AF which are related to severity of disease and increased mortality ratio. We aim to discuss the case of AF caused by mental disorder to examine its relationship and impact in patient's clinical outcomes. A 70 years-old-man came to clinic with palpitation five days before admission. He often cries and has not been able to sleep since his wife died three months prior. He admits to have neither hope nor desire to do his usual activities or even start new activities. Vital signs show BP 140/90 mmHg, pulse 150x/m, RR 20x/m, SpO₂ 98%. Cardiopulmonary examination revealed irregular S1-S2. ECG shows premature atrial contraction which evolved to asinus rhythm with HR 150x/minute, AF and incomplete right bundle branch block a months after the first ECG was examined. Depression-Anxiety-stress scoring-42 (DASS-42) was conducted in this patient. Results shows the patient has very severe depression, intermediate anxiety and severe stress. Mental disorders lead to increased etiology of cardiac remodeling factors due to degeneration and sympathetic stimulation, which then induced the AF. Further research is needed to examine whether psychiatric treatment can prevent AF in improving quality of life, healthy behavior and awareness for managing mental health.

Keywords: AF, Depression, Anxiety, Stress

INTRODUCTION

Depression and anxiety are mental health disorders that are commonly found in health practices with lifetime risk of 17% and 29% each.¹ Psychological stress and negative emotions such as anger, depressive mood, and anxiety influence the high incidence rate of both morbidity and mortality worldwide. Individuals with depression, anxiety and stress also have higher risk in developing cardiovascular diseases, including AF.²

AF is a cardiac arrhythmia that most often discovered clinically in older population with globally prevalence estimated as 0.4-2% with lifetime risk estimated of 37% after the age of 55 years old.³ The prevalence of AF is estimated at 6 million in Europe and 2.3 million in the

United States, but found lower in the Asian population with estimation of 0.7-1.1% in individuals aged 40 years old, with an incidence rate of 0.7% in South Korea, 0.77% in China, 1.1% in Taiwan and 0.86% in Japan.⁴ Based on research conducted at Rumah Sakit Jantung dan Pembuluh Darah Harapan Kita, Indonesia at 2014, the prevalence of AF has been shown to increase significantly, which was respectively 7.1% in 2010, 9.0% in 2011, 9.3% in 2012 and 9.8% in 2013.⁵

Symptoms of depression, anxiety and stress often coincide with the incidence of AF but it is not clear whether these mental health problems affect the outcome of individuals with AF. Several studies have shown that patients with AF have a higher ratio of anxiety and depression than healthy patients, with a higher proportion of incidence occurring

in symptomatic AF patients which are related to severity of disease and increased mortality ratio.³ The aim of this study is to investigate the relationship and predisposing factors for AF caused by depression, anxiety and stress diagnosed in patients, and the effect to the patient's clinical outcome.

CASE REPORT

A 71-year-old man came to the clinic with complaints of palpitations since the previous 2 months. The pounding felt intermittent at first but became all day since the last 5 days. Pounding is heavy, especially during activities such as walking to become congested. Complaints have never been treated by the patient. The patient's wife had just died 3 months earlier. The patient often cries and has not been able to sleep since the patient's wife died. The patient admitted that he felt hopeless and had no desire to carry out activities, including starting new activities.

Examination of vital signs showed blood pressure 140/90 mmHg, pulse 150x/minute irregular, SpO₂ 98%. Cardiopulmonary examination revealed an irregular heart rate, but no murmur or gallop was followed. Other physical examinations were within normal limits. Electrocardiographic examination revealed an acinar rhythm with HR 163x/minute accompanied by premature atrial contractions. Psychiatric assessment was assisted by using the depression anxiety stress scale score (DASS-42). The results obtained by the patient had a depression score of 39 points (very severe depression), anxiety 14 points (moderate anxiety) and a stress score of 26 points (severe stress). The patient was given Bisoprolol 5 mg/day, digoxin 0.25 mg/day, and chlorpheniramine maleate 4 mg/night. The patient refused to be given antidepressants, and wanted to try arrhythmia treatment first and further examination by cardiologist and psychiatrist.

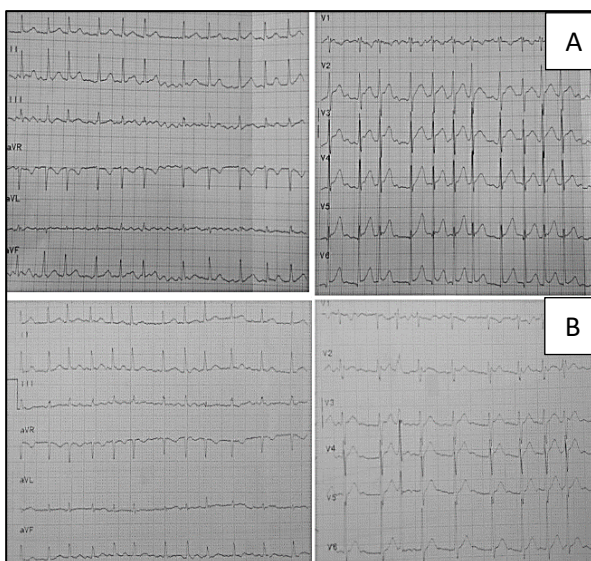


Figure 1 (A and B): Electrocardiography, result showed an acinar HR 150 beats/minute with AF and incomplete right bundle branch block.

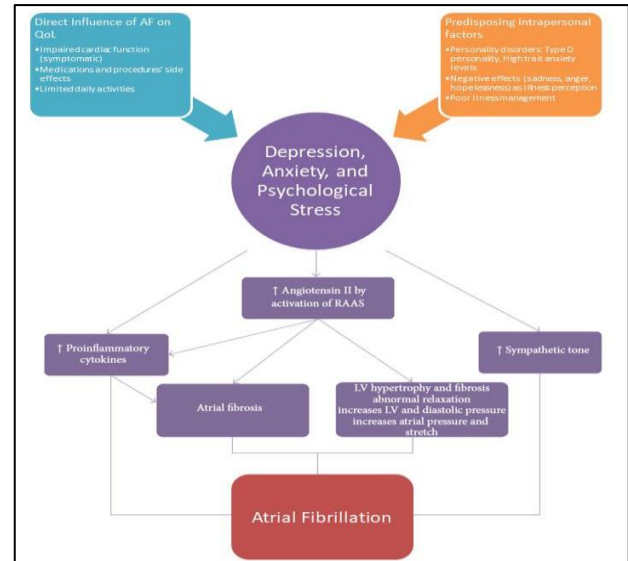


Figure 2: Hypothesis of the interrelationship between the pathophysiology of depression, anxiety and stress on AF.²³

Table 1: Depression anxiety stress scale (DASS-42) score. Result obtained by the patient had depression (D) score of 39 points (very severe depression), anxiety (A) 14 points (moderate anxiety) and stress (S) score of 26 points (severe stress).

Q	Score	Q	Score	All D scores	All A scores	All S scores
1	2	22	3			5
2	1	23	0		1	
3	3	24	3	6		
4	0	25	3		3	
5	2	26	3	5		
6	3	27	1			4
7	1	28	1		2	
8	3	29	2			5
9	2	30	0		2	
10	3	31	3	6		
11	3	32	1			4
12	1	33	2			3
13	3	34	3	6		
14	1	35	1			2
15	1	36	1		2	
16	2	37	3	5		
17	3	38	3	6		
18	3	39	0			3
19	1	40	1		2	
20	1	41	1		2	
21	3	42	2	5		
				39	14	26
				Total for D	Total for A	Total for S

In the 4th week, the patient came back to the clinic for a re-examination. the patient's complaints of palpitations. The patient admitted not to take medication regularly and

missed the schedule for both re-electrocardiography examination and visits to cardiologists or psychiatrists because he did not have the funds as he has retired from his job and currently unemployed. The patient told all his problems by crying. Examination of vital signs showed blood pressure 120/86 mmHg, pulse 160x/minute irregular, SpO₂ 96%. Physical examination obtained the same results as previous examination. Electrocardiography showed an acinar HR 150 beats/minute with AF and incomplete right bundle branch block.

DISCUSSION

Depression, anxiety and stress have a significant impact on cardiac health and can be used to predict the incidence of cardiovascular disease and consider as risk factors for adverse events in patients with heart disease. Advanced age and mental disorders lead to increased etiology of cardiac remodeling factors due to degeneration and sympathetic stimulation, in which it is associated with changes in expression, distribution and/or function of ion channels that alter action potential waveforms, propagation, and Ca²⁺ handling, increasing vulnerability to AF.^{2,3} In most elderly patients, AF occurs in the setting of structural heart disease, with only a small percentage exhibiting AF as a primarily electrical disorder.^{6,7} In correlation with our patient, a study by Umah and Handayani in Gresik stated that the elderly who lost their partner had a significant and positive correlation with the incidence of depression ($p=0.006$; $r=0.425$) which is in line with study by Tesio et al that this pre-existing factor will increase the risk of the patients to be diagnosed with major depressive disorder (MDD) before having the symptomatic coronary heart disease.^{8,9} Some research evidence suggests that depressive symptoms in patients with AF are associated with recurrent symptoms of AF and their complications such as heart failure and death.⁹

Depression results in an increase in neurophysiological activity and a locus ceruleus firing rate which results in uplifting heart rate, blood sugar, and blood pressure, as well as decreasing gastrointestinal blood flow. The enhancement of corticotropin releasing factor (CRF) then increases the secretion of adrenocorticotrophic hormone (ACTH) which affects on increased glucocorticoids, causing escalation of lipolysis, gluconeogenesis, proteolysis, and insulin resistance and reduced inflammation. Physiologically, depression steps up platelet aggregation and thrombus formation and lowers heart rate variability. The hypothesis regarding the relationship between depression and chronic inflammation is based on the enhancement in interleukin-6 (IL-6) and c-reactive protein (CRP). The association between depression and recurrent episodes of AF was also influenced by demographic factors including age; somatic and other comorbid diseases; prolonged atrial remodeling or left atrial dimension (LAD).¹⁰

Framingham Offspring's study of 3682 respondents which was conducted during a 10-years follow-up stated that the

symptoms of anxiety in male respondents (HR: 1.1; 95% CI, 1.0-1.3) had a weak relationship to the risk of AF occurrence and no relationship was found among female respondents (HR: 1.0; 95% CI, 0.8-1.3).² Symptoms of anxiety and depression including decreased daily functioning, quality of life and mood was significant to be observed as for effective therapeutic measures in elderly patients with AF.⁵

There was a 42% increased risk of AF related to tension or stress (10 years long-term scale) in workers who worked 55 hours or more in a week compared to those who worked 40 hours or less in a week. Research by Lampert et al. in 2014, which used electronic diaries to monitor real-time emotion in patients with paroxysmal and persistent AF, showed that feelings of sadness and anger preceded the AF episode which was identified through Holter EKG recordings and indirectly indicated that these negative emotions can trigger the incidence of AF in patients. However, the results of this report regarding both depression and stress as predictors of long-term AF were still not clearly explained.¹¹

American heart association (AHA) recommends screening for psychosocial comorbid risk factors and adequate management of in both patients with cardiovascular disease and population at risk of the disease.¹² In our patient, depression, anxiety and stress scales (DASS-42) Indonesian language is used to determine the mental health status. According to research by Widyana, Sumiharso and Safitri Indonesian version of DASS-42 has a sensitivity value of 78-89% and a specificity of 71-76% and was considered valid and reliable ($r=0.954$ for depression scale, 0.903 for anxiety scale, and 0.917 for the stress scale).¹³

Garg et al showed that depressive symptoms and the use of antidepressants contributed to an increased risk of AF by more than 30% in a 12 years follow-up. A history of taking antidepressants can be used as an indicator of a wider range of illnesses that increased internal stress levels. However, it is unclear whether stress generally causes AF or only certain emotions would affect it.¹⁴ Similar to our patient, study by Fenger-Grøn et al in patients with depression who had never taken antidepressants, demonstrated that the risk of AF was significantly increased before antidepressant treatment (HR=3.18; 95% CI: 2.98-3.39) and within the first month after initiation (HR=4.29; 95% CI: 3.94-4.67), then decreased 6–12 months after initiation (HR=1.11; 95% CI: 1.06-1.16).³

CONCLUSION

In conclusion, mental disorders can lead to the activation of inflammatory processes and autonomic imbalances that can contribute to the long-term risk of developing AF. Further research is needed to examine whether psychiatric treatment can contribute to prevent AF in order to improve the quality of life and healthy behavior of patients, as well

as increase awareness for managing mental health problems in patients with AF.

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