

Echocardiographic associates of impaired sleep quality in patients with anxiety and depression

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Objective: Sleep health, mental health and cardiovascular health are multidimensional constructs that are strongly associated with each other. Anxiety and depression are the most common psychiatric diseases in the community and frequently comorbid in routine clinical practice. This study sought to investigate whether there is an association between sleep quality and echocardiographic parameters in patients with anxiety and/or depression.

Methods: The clinical and instrumental findings of consecutive patients diagnosed with either of anxiety disorders and/or depressive disorders and underwent cardiac examination in our tertiary center on the same day were retrospectively reviewed. The diagnosis was made by a psychiatrist according to the criteria listed in the fifth edition of The Diagnostic and Statistical Manual of Mental Disorders. Afterwards, Hospital Anxiety and Depression Scale (HADS) and Pittsburgh Sleep Quality Index (PSQI) were applied to patients to assess symptom severity and sleep quality, respectively. Subsequent to psychiatric examination, the patients underwent echocardiographic examination that includes two-dimensional conventional echocardiography, tissue doppler imaging (TDI) echocardiography, atrial conduction times, and left atrium (LA) volumes and functions.

Results: The final study population consisted of 167 patients and divided into two groups according to their PSQI score: PSQI<5 (normal sleep quality) (n=32) and PSQI≥5 (impaired sleep quality) (n=135). Aortic diameter, left ventricular (LV) end-systolic diameter, LV end-diastolic and -systolic volume, LV stroke volume and LV stroke volume index, LV outflow tract velocity–time integral (LVOT-VTI), and LA conduit volume calculations were significantly lower in patients with impaired sleep quality compared to patients with normal sleep quality. The other echocardiographic parameters including LV systolic functions, doppler and TDI echocardiography indices, atrial conduction times, atrial mechanical functions including LA function index (LAFI) were similar among groups. Correlation analysis yielded a negative, weak but statistically significant correlation between LAFI and PSQI score ($r=-0.17$, $p=.030$) (Figure 1A). Left intra-AEMD positively and significantly correlated with PSQI score at a weak level ($r=0.16$, $p=.043$) (Figure 1B). Aortic diameter, LV stroke volume index, LVOT-VTI and conduit volume were determined as echocardiographic parameters significantly associated with impaired sleep quality in univariate analysis. Among these parameters, only conduit volume remained as significant and independent associate of impaired sleep quality in multivariate logistic regression analysis (Odds ratio:0.91, 95% Confidence interval:0.85-0.98, $p=.018$) (Table 1).

Conclusion: There is an independent association between LA conduit volume and impaired sleep quality in patients suffering from anxiety and/or depressive disorders.

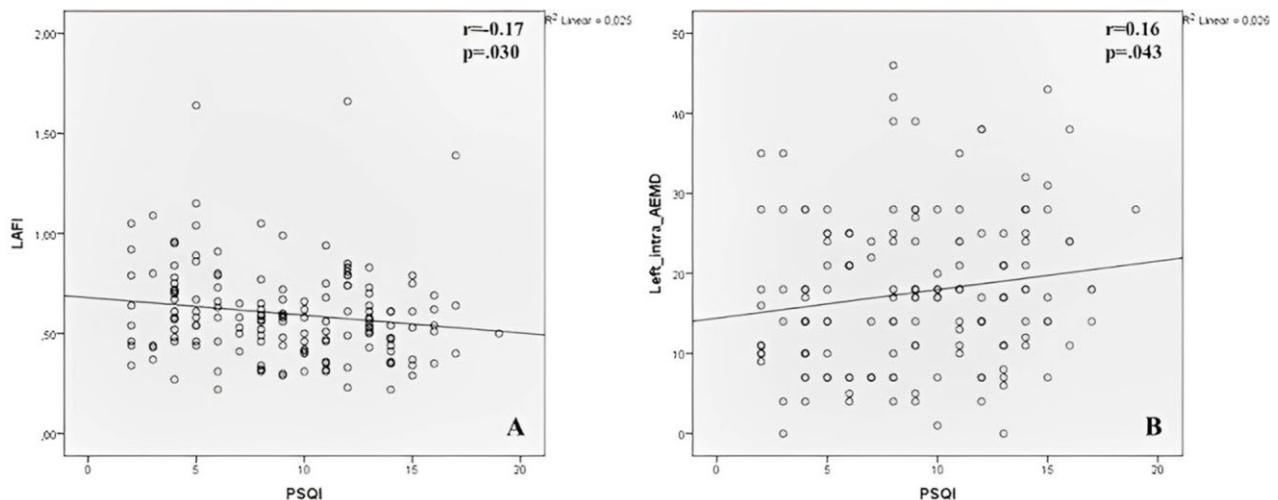


Figure 1

Table 1. Echocardiographic associates of impaired sleep quality by logistic regression analysis						
	Univariate			Multivariate *		
	Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Aortic diameter	0.82	0.68-0.97	.028	0.82	0.67-1.01	.068
LV stroke volume index	0.92	0.86-0.99	.025	0.92	0.85-0.99	.033
LVOT-VTI	0.87	0.78-0.97	.019	0.89	0.78-1.01	.092
LAFI	0.35	0.07-1.70	.195	..	..	..
Conduit volume	0.93	0.88-0.99	.030	0.91	0.85-0.98	.018
E/e' average	1.17	0.95-1.44	.139	..	..	..
Left intra-AEMD	1.03	0.99-1.08	.095	..	..	..
* Adjusted for age, smoking status, total HADS score, hypertension, diabetes mellitus						

Abbreviations: AEMD= Atrial electromechanical delay, LAFI= Left atrium function index, LV= Left ventricle, LVOT-VTI= Left ventricle outflow tract velocity–time integral.

Table 1