

Study of Autonomic Function Changes in Patients with Generalized Anxiety Disorder in an Ethnic Community of North East India

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Abstract: Anxiety disorders are a very common mental health problem in our community. However, many people are not aware of the fact that if they are not properly treated in time, can result in a wide range of heart diseases that includes Heart attack, Arrhythmias and Coronary arterial diseases. Various research studies have associated this disorder with reduced vagal tone of the heart as also sympathetic nervous system inhibition. However, very less studies have been conducted both at the national & international level to address the issue. The objectives of the study are to find out the involvement of autonomic nervous function in patients of Generalized anxiety disorder. Autonomic function was tested in 45 patients with anxiety disorder and 38 age & sex matched normal healthy subjects by using a set of 5 tests, i.e. 1) Heart rate variability (HRV) to deep and slow breathing (E: I). 2) Heart rate response to postural change (30: 15). 3) Heart rate response to valsalva maneuver (VR). 4) Change in systolic blood pressure on sudden standing. 5) Change in diastolic blood pressure on Isometric handgrip test. **Results:** The E: I value was found to be low in patients compared with normal healthy subjects indicating reduced parasympathetic function. The mean fall in systolic blood pressure on sudden standing was also less in patients which indicates sympathetic function inhibition. **Conclusion:** Patients with anxiety disorders are found to have sympathetic function inhibition as also a lesser vagal tone of the heart making them vulnerable to a wide range of Heart diseases like arrhythmias, heart attack & even Coronary arterial diseases.

Keywords: Heart rate variability, Generalized anxiety disorder, Autonomic nervous system, Cardiac vagal tone.

1. Introduction

Anxiety disorders are one of the most common mental health problems in our society. Their prevalence are so high that even in the United States, one in four adults has an anxiety disorder at some point in his or her life. Anxiety is described as the presence of fear or apprehension that is out of proportion to the actual life context. In simple terms, extreme fear or apprehension is considered clinical anxiety if it is inappropriate to an individual's life circumstance. Anxiety can be conceptualized as a normal & adaptive response to threat that prepares the organism for fight or flight. It is associated with increased somatic & autonomic activity that is controlled by the interaction of the sympathetic nervous system and parasympathetic nervous system.¹

Autonomic nervous system comprises of a vast network of neurons, ganglia & plexuses that supply almost all the organs of the body. It plays an important role in maintaining homeostasis of the body systems. This neuronal network controls the contractile & electrical activity of the myocardium through the interaction of the parasympathetic and sympathetic systems. Almost all the various types of anxiety disorders are associated with autonomic dysfunction. It is characterized by reduced vagal activity of the heart & decreased heart rate variability. Over a period of time, it ultimately results in a wide range of heart diseases resulting in increased morbidity and mortality.⁴ It is sad that very few people are aware of the high morbidity & mortality that comes with this mental disorder.

2. Materials and Methods

This research work was carried out in the Department of physiology, RIMS, Imphal from June 2015 till April 2017 by using a set of autonomic function tests. We got approval from the Institutional ethics committee for our work. The study was carried out in 45 patients of generalized anxiety disorder in the age range of 16 - 54 & 38 age matched control. Smokers, alcoholics and patients with Diabetes mellitus were excluded from the study. The patients were diagnosed by a psychiatrist as per the guidelines of DSM - IV TR. The tests were carried out by using an instrument polyrite model no.206, Recorders & Medicare systems, Chandigarh. The patients were prepared properly on reaching the department by giving atleast 15 minutes rest.² Autonomic function was tested by using a set of 5 tests - 3 for parasympathetic & 2 for sympathetic.⁶

3. Results & Observations

Our research work was based on the data we got from 45 patients diagnosed with GAD and 38 age matched healthy control subjects. The mean valsalva ratio of the GAD patients is marginally higher than the control group, although not statistically significant. The mean value of the 30: 15 is lower in the patients compared to the control, though the difference is also not statistically significant. The mean E: I value of the control group is relatively higher than that of the patients which indicates reduced parasympathetic reactivity in anxiety patients. The mean decrease in the systolic blood pressure on sudden standing was found to be comparatively less in patients than the control group & it was statistically significant. This finding points towards inhibition of the sympathetic component in anxiety patients.

Table

Parameter		Mean	SD	T value	Significance value	P value
30: 15	patients	1.16	0.102	0.27	1.116	p>0.05
	control	1.19	0.138			
VR	patients	1.43	0.23	0.53	0.598	p>0.05
	control	1.4	0.253			
E: I	patients	1.23	0.15	2.25	0.028	P<0.05
	control	1.309	0.135			
ΔSBP	patients	- 0.216	5.672	1.95	0.049	P<0.05
	control	2.4	5.156			
ΔDBP	patients	15.135	6.936	1.36	0.177	p>0.05
	control	17.933	9.804			

4. Discussion

Anxiety disorders are one of the most common mental health problems in the social set up of Meitei community. It is often associated with various signs & symptoms which indicates changes in autonomic activity. In our research work, the E: I is apparently the more sensitive tool in detecting early autonomic changes. The quantitatively lower values of 30: 15 & the statistically significant difference in the E: I values between patients and control indicate a decrease in parasympathetic function. The findings of my research work are same as that of Friedman et al., 1998.2 The comparatively lower values of the mean fall of systolic blood pressure on sudden standing in patients also points towards sympathetic function inhibition.

Limitations of my study

The sample size of my study is comparatively smaller & may not reflect the true picture of my entire community.

5. Conclusion

Among the mental health problems, Generalized anxiety disorders are one of the most common in our community. This high prevalence may be attributed to the bad law & order situation and the socioeconomic problems faced by the people of my community. Various studies around the world have come across autonomic changes in patients with GAD. These could be because of excessive cardiovascular reactivity in such patients. The findings of my study are sympathetic function inhibition & decreased parasympathetic reactivity.

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