

ORIGINAL RESEARCH ARTICLE

Effects of Yoga on Anxiety and Autonomic Function in Panic Disorder Patients

M.Amatya*¹ and BH.Paudel²

¹Department of Clinical Physiology, College of Medicine – Nepalese Army Institute of Health Sciences, Kathmandu, Nepal

²Department of Clinical Physiology, BP Koirala Institute of Health Sciences, Dharan, Sunsari, Nepal

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ABSTRACT

Introduction: Yoga is known to modify autonomic activity and improve stress coping abilities in normal and disease states including, as hypothesized, panic disorder which is characterized by episodic sympathetic hyperactivity and heightened anxiety.

Methods: Panic disorder patients with / without agoraphobia were systematically randomized into study and control groups. The study group received drug therapy and did yoga ½ h / day for one month; the controls received drug therapy only. Anxiety and panic attack episodes were assessed before and after intervention, using Hamilton Anxiety Scale (HAS) and Hopkins symptom Checklist (SCL) respectively. Autonomic function was assessed by standard tests: deep breathing, lying-to-standing, handgrip, and Valsalva maneuver. Data of two groups were compared by Kruskal-Wallis test.

Results: After the intervention, both the groups had reduction in HAS (control [16.00 ± 7.96 vs. 8.54 ± 4.20, p < 0.01], cases [12.17 ± 7.03 vs. 4.33 ± 2.07, p < 0.05]) and SCL (control [28.62 ± 11.10 vs. 11.23 ± 9.98, p < 0.01] and cases [21.67 ± 11.00 vs. 2.50 ± 3.89, p < 0.01]) scores though compliance seemed poor in study group. The study group had resting heart rate lowered, and less diastolic BP rise (16.00 ± 9.88 vs. 19.33 ± 4.32 mmHg, p = NS) on handgrip after the yoga as compared to controls (13.50 ± 11.35 vs. 24.38 ± 5.32 mmHg, p < 0.01).

Conclusion: One month of yoga is an effective adjuvant therapy for panic disorder patients. Yoga acted by lowering tonic anxiety and sympathetic activity.

Key words: anxiety, panic disorder, autonomic function, sympathetic.

INTRODUCTION

Anxiety is an individual's response to dangers or threats, real or imagined. While some degree of anxiety response is beneficial to prepare the body to cope better with the stressful condition, excessive anxiety results in deterioration in performance. Thus, one can speak of normal anxiety and pathological anxiety^[1]. Pathological anxiety is an inappropriate response to a given stimulus, by virtue of its intensity or duration. It probably results from a poorly regulated or over-reactive adrenergic system of the midbrain locus ceruleus, and manifests as heightened sympathetic activity^[2].

Anxiety disorders are one of the common psychiatric disorders, present in up to 15-20% of the total medical clinic patients^[3]. Panic disorder, characterized by spontaneous and unexpected occurrences of panic attacks, is one common type

of anxiety disorders, with a lifetime prevalence estimated at around 5%^[4].

Anxiety disorders manifest physically as increased sympathetic activity such as tachycardia, palpitation, tachypnea, breathlessness, sweating, restlessness, and muscular tension. The sympathetic hyperactivity is especially more intense during panic attacks and majority of panic disorder patients have increased sympathetic activity even at panic-free period and this baseline sympathetic activity is a predictor of severity of panic attacks^[5-7].

Currently, the treatments available for anxiety and panic disorders are among the most effective in psychiatric medicine. Pharmacological, cognitive behavioral and psychodynamic approaches have all proved useful in combating anxiety disorders. However, treatment has been difficult and search continues for a better approach as either of them,

including combined therapeutic approaches, has its own merits and demerits in terms of safety from adverse reactions, relapse of the disease, effectiveness, time consumption, and compliance^[5]. In this context, the practice of yoga has gradually gained recognition in improving the quality of life and in treating a number of psychiatric and psychosomatic disorders.

In healthy volunteers, the practice of selected yoga procedures has been found to result in more rapid recovery from stress and increase in subjective well being^[8]. Practice of yoga procedures have been tested with beneficial effects in a number of medical and psychiatric disorders including hypertension, alcohol dependence, and generalized anxiety disorders^[9-12].

While authors have demonstrated effects of yoga varying from subjective feelings to metabolic alterations, the common effects are mostly related with decreasing the level of sympathetic activity. Panic disorder is chiefly characterized by episodes of panic attacks with surges in sympathetic activity. It was hypothesized that yoga practice would be an effective adjuvant in treatment of panic disorder.

Objective of the study was to compare, by using clinical and physiologic tools, the effectiveness of combined drug and yoga treatment against treatment with drugs alone in panic disorder patients.

MATERIALS AND METHODS

New patients fulfilling the DSM-IV TR criteria for panic disorder with or without agoraphobia^[13] were recruited from the BPKIHS Psychiatry OPD. Initial assessment, both clinical and physiological, was done and the patients were grouped into the control or the study group.

Respective treatment regimens were prescribed and patients were asked to do a follow-up visit after 4 weeks. Controls received the usual drugs for panic disorder while the cases (study group patients), in addition, also practiced a set of yoga postures.

Final assessment was done after 4 weeks intervention. Outcomes were compared with the initial measurements. Also, outcomes of the two groups were compared.

The drugs were prescribed in accordance with the standard regime. Usually, a combination of a Benzodiazepine with an antidepressant such as Sertraline or Fluoxetine was used. The dosage and the combination were similar, without group preference. Occasionally, symptomatic relief was

desirable and obtained by the use of analgesics and beta-blockers.

In addition to the pharmacotherapy, patients of the study group practiced a set of yoga postures comprising of 5 asanas – shashankasana (the hare posture), bhujangasana (the serpent posture), sarvangasana (the shoulder support posture), halasana (the plough posture) and savasana (the corpse posture), in that order. Two to 3 cycles of each posture could be performed within 5 minutes. The patients practiced yoga for 30 minutes daily, in the morning hours. The selection of the specific asanas was on the basis that these have been recommended as being beneficial in anxiety disorders.^{14,15} No other additional recommendations, such as refraining from non-vegetarian diet and lifestyle modification, were advised.

Clinical assessment was done in the OPD and included two scales –

- i. Level of baseline anxiety of the patients was measured by using the Hamilton Anxiety Scale (HAS).
- ii. Severity of panic attack episode was measured by using the Hopkins Symptom Checklist for panic Anxiety (SCL-19).

Physiological assessments were carried out in the autonomic function lab of the department of physiology, BPKIHS^[16,17]. All measurements were performed between the morning hours of 10.00 am and 12.00 noon. Level of autonomic activity was assessed by measuring the heart rate (HR) and blood pressure (BP) responses to –

- Resting state
- Deep breathing test (DBT) – E:I ratio was calculated (normal ratio 1.2:1 or more).
- Lying-to-standing test (LST) –
 - Fall in SBP was measured (normal fall is 10 mmHg or less).
 - 30:15 ratio was calculated (normal ratio is 1.04:1 or more).
- Hand grip test (HGT) – Rise in diastolic blood pressure (DBP) was measured (normal rise is 16 mmHg or more).
- Valsalva maneuver (VM) – Valsalva ratio (VR) is calculated (normal VR is 1.2 or more)

Criteria for exclusion were – comorbidity of other mental disorders, chronic and major untreated medical disorders (especially cardiovascular, respiratory, endocrine, and neurological), and conditions affecting autonomic activity (use of other drugs, athletes, practice of other relaxation exercises and meditations).

The procedures involved are entirely noninvasive. An informed written consent was obtained from the participating patients. The study was approved by the BP Koirala Institute of Health Sciences (BPKIHS) ethical committee.

Data was tabulated and analyzed with the help of Microsoft Excel, Epi-Info 2000, and Kruskal-Wallis test. A p value < 0.05 was considered significant.

RESULTS

The study was completed in 19 patients out of 30 recruited; 13 in control group (5 males and 8 females) and 6 in study group (5 males and 1 female).

Initial clinical and physiological assessment

To begin, the groups were comparable in mean age and severity of baseline anxiety as well as panic episodes. Also, the groups had comparable levels of autonomic activity on the initial clinical assessment. The groups differed significantly only in the valsalva ratio (Tables 1 & 2).

Changes in clinical anxiety levels after 4 weeks intervention:

At the end of the 4 weeks intervention, both groups had improvements in baseline anxiety as well as severity of panic attacks. The decreases in HAS and SCL scores were statistically significant. The magnitudes of changes were comparable in both groups (Table 3).

Table 3: Comparison of clinical anxiety scales after 4 weeks intervention

Clinical scales	Study group			Control group		
	Initial	End	p value of difference	Initial	End	p value of difference
HAS	12.17±7.03	4.33 ±2.07	0.0292*	16.00±7.96	8.54 ±4.20	0.0074*
SCL-19	21.67±11.00	2.50±3.89	0.0071*	28.62±11.10	11.23±9.98	0.0011*

Table 4: Comparison of physiologic parameters after 4 weeks intervention

Physiologic parameters	Study group		Control group	
	Initial	End	Initial	End
HR at rest	101.33±19.04	80.67±4.68*	96.62±19.99	89.54 ±16.78
SBP at rest	127.00±8.83	126.00±5.37	87.69 ±17.26	122.31±12.80
DBP at rest	90.00±14.59	91.00±13.78	87.69 ±17.26	82.92±13.48
DBT E:I ratio	1.22 ±0.12	1.28 ±0.07	1.25 ± 0.13	1.29 ±0.12
LST change in SBP	-5.67 ±8.62	-6.33 ±4.97	1.23 ± 0.27	1.22 ±0.23
HGT rise in DBP	16.00 ±9.88	19.33 ±4.32	13.50 ±11.35	24.38±5.32*
VR	1.41 ±0.30	1.60 ±0.19	1.71 ±0.33	1.73 ±0.23

DISCUSSION

Literature reviews show that practicing of yogic postures modifies autonomic activity and improves stress-coping abilities. Panic disorder is an anxiety disorder characterized by episodes of intense anxiety associated with sympathetic hyperactivity and persistent baseline anxiety. We hypothesized that practice of selected yogic postures will benefit panic disorder patients. Yogic practice approach has been tested in different psychiatric and hypertensive disorders and experimentally in general population.

Changes in physiological parameters after 4 weeks intervention:

The study group patients had a statistically significant decrease in the resting heart rate level. In rest of the physiological parameters, significant changes were not observed. In the control group, changes in most of the autonomic physiologic parameters were subtle and not significant, except in the hand grip test. In the test, the rise in DBP was of statistically significant magnitude. Comparing the physiologic changes in the two groups, the decrease in resting HR was to a greater extent in the study group than in controls and the magnitude was statistically significant (20.67 Vs 7.08, p < 0.03). Comparison in changes in other parameters did not show significant differences (Table 4).

Table 1: Comparison of mean age and clinical anxiety scales at the start of study

	Control group (n = 13)	Study group (n = 6)
Mean age (years ± SD)	33.54 ± 11.48	32.17 ± 7.60
HAS	16.00 ± 7.96	12.17 ± 7.03
SCL-19	28.62 ± 11.10	21.67 ± 11.00

Table 2: Comparison of physiologic parameters at the start of study

Physiologic parameters	Control group	Study group
Resting HR	96.62 ± 19.99	101.33 ± 19.04
Resting SBP	129.69 ± 23.80	127.00 ± 8.83
Resting DBP	87.69 ± 17.26	90.00 ± 14.59
DBT (E:I)	1.26 ± 0.13	1.22 ± 0.12
VR*	1.71 ± 0.33	1.41 ± 0.30
HGT (DBP rise)	13.50 ± 11.35	16.00 ± 9.88
LST 30:15	-2.83 ± 7.41	-5.67 ± 8.62

However, its use in treating panic disorder has not been publicized.

We recorded baseline anxiety in most panic-free days by HAS and level of baseline autonomic sympathetic activity by a battery of autonomic function tests. Sympathetic activity level during panic attack cannot be measured for obvious practical reasons; its severity was clinically assessed by the SCL-19.

The study was completed in 19 patients out of 30 recruited initially. Control and study groups differed in size and sex distribution. The groups

matched in levels of baseline anxiety, severity of panic attacks, and baseline sympathetic activity. Patient blinding is obviously not possible in this study.

At the end of 4 weeks intervention, both groups had significant reductions in severity of baseline anxiety as well as panic attack. Magnitudes of change in both groups were comparable.

In assessing baseline sympathetic activity, most parameters did not vary significantly from initial values. However, the resting HR significantly lowered from initial level in the yoga group. In the control group, rise in DBP in response to hand grip test was significantly higher. This was interpreted as persistence of higher sympathetic activity level in the controls (higher DBP rise response) and more inhibition of the sympathetic activity level in the study group (lower resting HR).

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