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THE CONSEQUENCES OF *ANULOMA-VILOMA PRANAYAAM* ON SELECTED CARDIO-RESPIRATORY FUNCTION IN VOCATIONAL STRESS PATIENTS

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ABSTRACT

Vocational stress may be defined as a "mechanism whereby the human body attempts to adapt to the environment." The body has a normal mechanism for dealing with stressful situations that is known as the "fight or flight" response. As soon as the brain senses danger, it sends messages (electrical, chemical, hormonal) that stimulate the extra energy needed to fight the danger or run away from it. The stress cycle always includes the danger stimulus, the removal of the danger, and a state of relaxation. There are a number of working conditions that we encounter on a daily basis which contribute to making work stressful. These working conditions are called "stressors" and consist of those things which have a negative effect on a worker's physical or emotional well-being. Vocational stress is not an objective phenomenon. It is predominantly subjective in nature, and involves the employee's active interpretation of his or her objective circumstances. As a non-pharmaco therapeutic and safe modality, *Yoga* can be used as an effective lifestyle adjunct to medical treatment to reduce drug dosage and improve quality of life of the patients. It is to be emphasized that yoga is very effective for prevention as well as management of all-pervading stress and stress-related disorders. Modern medicine is very effective in controlling infections, performing surgeries and managing diseases. However, it has limited role in stress-based, chronic degenerative, old age and lifestyle related disorders which are the bane of modern society. *Yoga* has been found

to be very effective in these conditions. Therefore, present study was conducted to assess selected cardio-respiratory function to one month *Anuloma-Viloma pranayaam* of persons who underwent work related psychological stressors. Twelve male subjects between 20 to 45 years, who had no history of other major illnesses, were selected for the study. At the initial visit, a detailed medical history and symptomatic evaluation was done. This group had a higher rate of respiration and irregular breath pattern, increased heart rate and slightly elevated blood pressure with symptoms of stress and anxiety. The heart rate, respiratory rate and pattern, blood pressure were recorded. Parameters were assessed at the beginning and end of the month. These patients showed a significant decrease of heart rate, respiratory rate, diastolic blood pressure, and highly significant in increasing baseline breathing holding time. There were significantly reducing various stress symptoms observed after the therapy. These results suggest that the selected breathing technique (*Anuloma-Viloma*) have a marked stimulating effect on parasympathetic nerve system or relaxing effect on sympathetic nervous system.

KEYWORDS: *Anuloma-: Viloma*, Stressor, Vocational stress, *Yoga*.

INTRODUCTION

Among the major negative effects of job stress are its impact on a person's self-image and self-esteem, which in turn, affects one's relationship with family, friends, and co-workers. The problems last far longer than the time we spend at work and are not easily left behind at the end of the day. So analyzing working conditions as a primary source of stress is an important first step in overcoming it, especially because in many situations the long-term effects show up in our private lives and the workplace link can be lost altogether.

Stress is known to adversely affect immune functions and neuroendocrine axis of the body which leads to various disease states. Autonomic nervous system consists of two limbs; sympathetic nervous system and parasympathetic nervous system. Although individual *asan* and *pranayam* practices can selectively affect sympathetic or parasympathetic nervous system, the overall effect of *yoga* practice is to bring a state of parasympathetic dominance. Vempati and Telles (2002) assessed the effect of *yoga* based guided relaxation on autonomic variables and found that power of the low frequency component of heart-rate variability pectrum reduced, whereas the power of high frequency component increased, suggesting a reduced sympathetic activity. According to reports 50% employees in India are under stress: 30% have problems such as addictions and marital discord.20% suffer from depression.

Depression is the No 1 occupational disease of the 21st century says WHO. 49% of people under stress say they suffer from upset stomach or nausea. 71% people undress stress feel they are not productive and cry regularly. Two studies on a practicing yoga breathing (*ujjayi pranayama*) reported increases in oxygen consumption by 19% and 9%, respectively during the practice of *Yoga* (Miles, 1964; Rao, 1968).

Regular practice of *Yoga* and meditation alters levels of various neurotransmitters in the brain. Kjaer et al (2002) used PET scan technique to demonstrate 65% increase in endogenous dopamine release in the ventral striatum during *Yoga nidra* meditation Streeter et al (2007) demonstrated that in experienced *yoga* practitioners (n=8), brain GABA levels increase after a session *of yoga. Yoga* practitioners completed a 60 minute yoga session and comparison subjects completed a 60 minute reading session. This suggests that the practice of *yoga* should be explored as a treatment for disorders with low GABA levels such as depression and anxiety disorders.

Hence the present study aimed at analyzing the selected cardio-respiratory functions of the body, related to the practice of *Anuloma-Viloma pranayama* breathing technique.

1. METHODS

There were 12 male subjects, with ages ranging from 20 to 45 years, taken from the a private clinic Raj Physiotherapy Center, Roorkee Haridwar, U.K., who had work related psychological stress condition, while none had a history of other major illnesses, selected for the study. Routine medical examinations were concluded. The study was explained to the patients and their signed informed consent was taken Patients were given a structured-questionnaire which consists of two sections. The first section consists of the demographic variables of the subjects and the second section consists of closed-ended questions to assess the clinical features of stress condition. Baseline assessment was carried out on twelve patients. Subsequent follow-up assessments were carried out after one month. During this period all 12 patients practice 20 minutes *Anuloma-Viloma pranayama* every day in the morning and evening before sleep.

Parameters for assessment:

1. forced expiratory volume in 1 sec (FEV)
2. Forced vital capacity (FVC)
3. ECG (lead 1) to derive heart rate by counting successive QRS complexes
4. Breath holding time and Blood pressure

All assessments were repeated twice on each subject initially twice after one month. Both recording were made on the same day. The timings of the initial recordings and the final recordings were also kept the same.

2. RESULTS

A. Socio-Demographic Profile of Stressed Subject

Stressed Subjects		**Males**
No of Subjects		12
Age		20 – 45
Locality	Urban	12
	Rural	0
Dietary Habits	Vegetarian	0
	Non vegetarian	12
Habit	Smoking	2
	Alcoholic consumption	7
Economic Status	Low	0
	Middle	9
	High	3
Education Status	Primary	0
	Secondary	7
	Degree	5
Family History		5
Occupation	Own Business	5
	Teacher	6
	Others	1

B. Results of clinical symptoms in stress subjects

Symptoms	**Mean score**		**% Relief**
	Before the therapy	**After the therapy**	
Restlessness	1.00	0.59	41.00
Easily tired	2.21	1.84	16.74
Acid eructation	2.38	1.71	28.15
Sleep disturbence	1.65	0.65	60.61
Restlessness	1.00	0.59	41.00
Heaviness in head	2.36	1.97	16.53
Irritability	1.16	0.81	30.17
Sadness	1.00	0.59	41.00
Alcohol abuse	1.00	0.93	7.00
Tobacco use	0.93	0.86	7.00
Social withdrawal	3.02	2.14	0.29

C. Baseline data of the subjects were compared using the paired t-test

No	Parameters	Baseline values	Values after one month Anuloma-Viloma pranayaam
1	Heart rate	81.02 ± 1.44	74.06 ± 1.22*
2	Respiratory rate	20.04 ± 0.53	15.02 ± 0.12*
3	Breath holding time	33.02 ± 1.01	47.03 ± 1.42***
4	FEV	2.02 ± 0.05	2.56 ± 0.06**
5	FVC	2.42 ± 0.10	3.56 ± 0.08***
6	Blood pressure Systolic BP Diastolic BP	 138.02 ± 3.05 96.16 ± 2.09	 124.56 ± 2.53* 86.16 ± 2.34**

*= P<0.05; **=P<0.01; ***=P<0.001

Twelve male subjects between 20 to 45 years of age were selected for the study. The socio demographic profile of selected subject has demonstrated that 100% of urban life style. Work related stressful conditions are involved in the etiopathogenesis of the disease, through which genetic inheritance is also noticed. Parameters were assessed at the beginning and end of the month. All the patients were evaluated for clinical relief from individual symptoms stress and anxiety. They were also investigated for autonomic function of the body. The finding reported in this study shows that the clinical features of stress and anxiety improved significantly after the therapy. Mild elevated blood pressure were found in stress subjects, which reduced significantly after following one month yogic breathing practice. These patients showed a significant decrease of heart rate and respiratory rate and highly significant in increasing baseline breathing holding time. There was a significant increase in FEV and FVC. These results suggest that the *Anuloma-Viloma pranayaam* have a marked effect on selected cardio-respiratory functions.

CONCLUSION

The present study showed that the Vocational stress patients who underwent one month *Anuloma-Viloma pranayaam* showed significant improvement in general health. There were significantly reducing various stress symptoms observed after the therapy. There was also evidence of decreased autonomic arousal and more of physiological relaxation.

These results suggest that the selected breathing technique(*Anuloma-Viloma*) have a marked stimulating effect on parasympathetic nerve system or relaxing effect on sympathetic nervous system.

Yoga affects every cell of the body. It brings about better neuro-effector communication, improves strength of the body, increases the optimum functioning of all organ-systems, increases resistance against stress and diseases and brings tranquility, balance, positive attitude and equanimity in the practitioner which makes him lead a purposeful and healthier life.

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