ORIGINAL RESEARCH PAPER

Physiology

"CARDIOVASCULAR PARAMETERS MODULATION IN REGULAR PRACTICE OF YOGA IN HYPER-REACTORS YOUNG HEALTHY MEDICAL STUDENTS TO COLD PRESSOR TEST."

KEY WORDS: yoga, cold pressor test, cardiovascular parameters

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ABSTRACT

Stress is a complex, dynamic process of interaction between a person and his or her life Stress is described as a state of anxiety, strain, nervousness, tension, constant worry or pressure, to produce hypertension and other cardiovascular disorders due to greatly enhanced secretion of cortisol and adrenaline due to increased activity in the limbic system, amygdala and hippocampus and parasympathetic predominance The aims of this study was to investigate whether regular practice of yoga for sixty minutes twice a day for six months can improve the cardiovascular parameters in hyper-reactors to cold pressor test in young healthy medical students. **Summary-** The regular practice of yoga for six months acts as stress buster, to reduce the hyerrectivity to cold pressor test by inducing parasympathetic predominance and cortico- hypothalamo-medullary inhibition.

INTRODUCTION

In an age of a highly dynamic and competitive world, man is exposed to all kinds stressors that can affect him in all realms of life. Hans Selye first introduced the term stress into life science.[1]

The stress response is a complex emotion that produces physiological changes to prepare us for fight-or-flight, to defend ourselves from the threat or flee from it.[2] Stress is a silent killer and prolonged exposure to stress may exert harmful effects on physical, psychological and behavioral well-being of an individual by increased sympathetic activation and the release of stress hormones, including adrenaline, lead to increases in heart rate, blood pressure, breathing body temperature, and muscle tension.[3,4]

On entering into the professional college, the student is in a new challenging and stressful environment. Factors contributing to high levels of stresses in professional colleges could be highly competitive curriculum, intense academic competition, and excessive demands on coping abilities in physical, emotional, intellectual, financial and social terms. Possibly these and many more factors contribute to high levels of stress in medical students. With the above facts in mind the relevance of yoga in medical education was evaluated.[6]

Almost any type of physical or mental stress can lead within minutes to greatly enhanced secretion of cortisol due to increased activity in the limbic system, especially the amygdala and hippocampus, both transmit signals to the posterior medial hypothalamus. Cortisol has direct negative feedback effects on.[7] The increase stress hormones may be as a result of stimulation of the ACTH secretion by the stress stimuli which stimulated the synthesis of adrenaline and cortisol precursors.[8] In response to a stressor, neurons of paraventricular nuclei of the hypothalamus secrete corticotrophin releasing hormone (CRH) into the hypophyseal portal system.[9,10]

In the study, cold pressor test, introduced by Hines and Brown, was employed to measure the cardiovascular reactivity. The persons hyper-reactive to cold pressor test are susceptible for early onset of hypertension, and other cardio vascular disorders in future.[11]

Yoga practices are time–honored stress management/health promotion techniques whose health benefits are being validated by modern medical science, significantly reduced levels of cortisol, reduce the level of stress, relieve anxiety, depression, increase anti – oxidant production, enhance brain function, enhance health well – being and peace of mind.[12] Yoga is the best lifestyle modification, which aims to attain the unity of mind, body and spirit through asanas (exercise), pranayama (breathing), and meditation.[13]

We tested whether regular practice of Yoga for 6 months can reduce the cardiovascular hyper reactivity, reducing the cardio vascular disorders, by inducing parasympathetic predominance and cortico-hypothalamo-medullary inhibition.[14] The present study has been undertaken with the aim of de-stressing the hyper-reactors by practicing Yoga, because hyper-reactors are likely to develop hypertension and other stress related diseases in future life.

AIMS & OBJECTIVE:

The aim of present research was to study the effect of six month yoga practice over serum cortisol and Systolic, diastolic blood pressure and pulse rate/ min on young healthy medical students.

MATERIALS &METHOD:

Study Design: Interventional Cross Sectional Study.

Place of Research: Department of Physiology, Index medical college Indore (M.P.)

Study Period: January to June 2020. Six months

Study Subjects: One hundred Fifty young healthy medical students, age group 18 to 27.

Inclusion Criteria:

All One hundred fifty subjects of age group 18 to 27 who were healthy, non-smoker, no history of hypertension and stress related diseases and not doing any type of physical exercise.

Exclusion Criteria.

Subjects who were taking other physical activity like gym, athletics etc.smokers, alcoholic, with respiratory disorders, jaundice, diabetes, hypertension and stress related diseases.

Methodology:

The present study was conducted on one hundred fifty young healthy medical students studying in Index medical college, underwent thorough clinical examination with proper history was taken with special emphasis on history related to

hypertension and stress related diseases and not doing any type of physical exercise.

Afterwards record the basal Sys.B.P., dias.B.P.and pulse pressure. They were subjected to cold pressor test according to Hines & Brown.[15] Rise of systolic BP more than 20 mm Hg and dias.B.P. 15 or more mm Hg was considered as hyper-reactive response.[16] Out of 150 volunteers, 105 (70%) turned out to be hyper-reactors. These hyper-reactors carried out Yoga for 60 minutes, twice a day for six months, under supervision and guidance of a certified "yoga" teacher. Again cold pressor test was done in all hyper-reactors and compared the all parameters, including Sys. B.P., Dias. BP. Amd Pulse rate/min before and after yoga, and cold pressor test value before and after yoga, were found to be statistically significantly reduced by using student "t test.

RESULTS

Our results showed tha Yoga practices significantly reduced the cardiovascular hyper-reactivity . In 150 male volunteers, the 105 were hyper-reactor to cold pressor test and these hyper-reactors practiced yoga regularly for six months and after this, all became hypo-reactors by carried out statistical analysis using student paired t" test and observed that the basal B.P., rise in BP and pulse rate due to cold stress, were statistically highly significantly decreased. (Table-1, 2 and 3).

Table No. 1: Showing basal values and effects of yoga on Sys. B. P., Dias. B. P. and Pulse rate/ min, *with their Mean & Standard Deviation and p value* in study group.

Parameters	Basal value	Effect of six month of yoga	P value
Systolic Blood Pressure(mm Hg)	124.1 ± 2.82	120.0 ± 1.98	(p<0.000)
Diastolic Blood Pressure(mm Hg)	82.68 ± 3.13	78.25 ± 4.15	(p<0.000)
Pulse rate/ min	77.79 ± 5.14	75.28 ±4.89	(p<0.000)

Table No. 2: Showing effect of cold pressor test before and effects of yoga, on Sys. B.P., Dias. B. P and Pulse rate/ min *with their Mean , Standard Deviation and p value* in study group

	Effect of cold pressor test		P value
Parameters	Effect of cold pressor test before yoga	Effect of six month of yoga	
Systolic Blood Pressure(mm Hg)	1422 ± 5.87	120.0 ± 1.98	(p<0.000)
Diastolic Blood Pressure(mm Hg)	98.77 ± 3.39	78.25 ± 4.15	(p<0.000)
Pulse rate/ min	85.77 ± 5.32	75.28 ±4.89	(p<0.000)

Table No 3: Showing effects of cold pressor test, before & after Yoga practices of six months on Sys. B. P. Dias. B. P.and Pulse rate/ min with their Mean , Standard Deviation and P value in study group.

Parameters	Effect of cold pressor test		P Value
	before Yoga Practices (C.P.T. 1st)	After Yoga Practices of six month (C.P.T.2nd)	
Systolic Blood Pressure (mmHg)	1422 ± 5.87	133.93 ± 3.93	(p<0.000)
Diastolic Blood Pressure (mmHg)	98.77 ± 3.39	92.06 ± 3.65	(p<0.000)
Pulse rate/ min	85.77 ± 5.32	78.59 ± 4.68	(p<0.0

DISCUSSION

On analyzing the effect of yoga on hyper reactors 105 medical students, age group 18-27 years, in our study. The basal sys. B. P, dias. B.P. and pulse rate were studied before yoga and after six month of yoga and also studied the effect of cold pressor test before and after yoga., Statistically highly significant (p<0.000) decreased all parameters & all became hypo-reactors due to decrease sympathetic activity & increase parasympathetic activity of A.N.S. due to increase in vagal tone[17,18,19,].

As yoga combines several techniques used for stress reduction, it provide the combined benefits of breathing exercises, stretching exercises, meditation practice. Yoga also requires more effort and commitment than taking pills or herbs for stress reduction.[20,21,22]

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