EFFECT OF SHORT DURATION YOGIC TECHNIQUE ON CARDIOVASCULAR PARAMETERS IN MEDICAL STUDENTS DURING YOGA

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ABSTRACT:

Asana, pranayama and meditation are major technique of yoga, originated in ancient India, which is important for maintaining a balance between the body and mind. This study was conducted to determine the effect of short duration pranayama and meditation on cardiovascular parameter in student which include pulse rate, systolic blood pressure, diastolic blood pressure.

Forty healthy subjects (22 males and 18 females) of 17-to-19-year age group, fulfilling the inclusion and exclusion criteria underwent one-hour daily yoga programme for 8 weeks. Pre and post cardiovascular parameters were assessed by recordings pulse rate, systolic blood pressure, diastolic blood pressure. The parameters were analysed by student’s t test. From the study it was observed that there was significant reduction in these cardiovascular parameters after doing pranayama and meditation for 8 weeks.

Our result indicates that regular practicing of yoga has beneficial effect on cardiovascular parameters in normal healthy individuals.

Keywords: yoga, short duration, cardiovascular parameters.

I. INTRODUCTION

Yoga is an ancient technique practiced in India since thousands of years. Yoga harmonizes the body and the mind. It is the art and science of healthy living. In modern age, Yoga is well known for disease prevention, cure and management of many life style related disorders mostly hypertension, diabetes [1]. Evidence suggests that hypertension is one of the major contributors to premature death in India. It is also prevalent in students of medical colleges. Sympathetic over activity is associated with development of pre-hypertension and hypertension. As medical students first time enter the professional studies, they are subjected to a large amount of stress and stress is responsible for sympathetic over activity and rise in blood pressure. Between body and mind breathing acts as a dynamic bridge [2]. Various studies shows that regular practices of yoga shift autonomic balance towards parasympathetic predominance that reduce stress by acting on living system [3]. The present study is undertaken to understand the effect of short duration yogic technique on cardiovascular parameters (BP, SBP, DBP) of 1st year medical students.

II. MATERIALS AND METHODS

The present study was conducted in forty first year medical students (22 males and 18 females) who were interested on learning yoga but had not practicing till then. This interventional study was conducted in the Department of physiology of S.C.B. medical college, Cuttack. All subjects were in the age group of 17 to 19 years. Subjects suffering from respiratory disease, cardiovascular disease, diabetes, kidney disease, physical deformity were excluded from the study. Also, smokers, those who takes alcohol or any drug were not included in the study. A detail clinical history was taken before their selection. Informed consent was taken was taken from all subjects. The students were subjected to simple clinical examinations like age, height, weight, body mass index.
All the students underwent daily one hour of yoga training 6 times per week for 8 weeks from 7 a.m. to 8 a.m. one hour of yoga training included – 10 minutes prayer and Suryanamaskar, 15 minutes various asanas like Mayurasan, Tadasan, Sarvangasan, Halasan, Bhrujangasan, Trikonasan, Shavasan, etc., 25 minutes various pranayama like Bhastrika, Kapalbhati, Bahya, Anulom-vilom, Bhramri and the session was concluded by 10 minutes meditation [4]. Cardiovascular parameters like pulse rate, blood pressure both systolic and diastolic were measured before and after yoga training. Pulse rate was measured in right radial artery in supine position after ten minutes of physical and mental rest. Blood pressure was measured in right arm in supine position by auscultatory method by using sphygmomanometer. All the parameters are compared and analysed before and after training.

The software SPSS statistics version 15.0 was used for analysing the data. The results were expressed as mean S.D. Student's t test was used to find the significance of study parameters. P value less than 0.05 was considered significant.

### III. RESULT

The results were compared between effect of yoga before and after training. It was found that in all the students (including boys and girls), after practicing yoga, the resting cardiovascular parameters were reduced significantly. The consequence of 8 weeks of pranayama and meditation practice on resting mean Pulse rate, systolic blood pressure, and diastolic blood pressure are represented in the table.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before yoga training(n=40) Mean± S.D</th>
<th>After yoga training(40) Mean ± S.D</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse rate</td>
<td>78.3 ±0.3</td>
<td>72.2±3.44</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>118.6±4.01</td>
<td>110.59±2.54</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>78.2±3.57</td>
<td>74.3±3.75</td>
<td>P&lt;0.0001</td>
</tr>
</tbody>
</table>

Graph 1: showing graphical representation of effect of cardiovascular functions before and after yoga practice

### IV. DISCUSSION

The study shows significant decrease in all cardiovascular parameters i.e.-pulse rate, systolic blood pressure and diastolic blood pressure after 8 week of yoga training. This significant decrease in resting pulse rate, systolic and diastolic blood pressure after 8 weeks of pranayama and meditation in our study is in line with the findings of previous studies on physiological effects of yoga practice in healthy individuals [5]. Similar reduction in resting PR and blood pressure after yoga practice were also reported in hypertensive patients, [6,7] in asthmatic patients [8] and in diabetic patients.[9]
Stress is responsible for sympathetic stimulation and rise in the blood pressure. The beneficial effect of lowering of blood pressure obtained in our study may be due to stress reduction by yogic technique particularly by meditation and pranayama.

Practice of yoga affects the higher centres like hypothalamus and limbic system and alters the autonomic discharge by decreasing sympathetic discharge and increasing parasympathetic outflow. Increase in vagal tone of heart causes slowing of heart rate and hence of the pulse rate seen in our study. Decrease in sympathetic discharge to the heart causes decrease in contractility of the heart, so the cardiac output decreases. This account for the decrease in systolic blood pressure seen in our study. Decreased sympathetic discharge also causes decrease in sympathetic tone of the arterioles, so there is vasodilation and decrease in peripheral resistance [10]. This results in decrease in diastolic blood pressure seen in our study.

Regular yogic practices also lead to decrease in oxygen consumption by heart and work load on the heart. This causes decrease in cardiac output. This may also account for decrease in systolic blood pressure seen in our body.

V. CONCLUSION

The study shows significant reduction in blood pressure (systolic and diastolic) and pulse rate after 8 week of yoga training. So, adoption of regular practice of yoga as a part of life style will certainly help to retard the development and progression of hypertension with the advancing age. Thus, doing yoga in regular basis will help to prevent morbidity and mortality due to cardiovascular diseases.

REFERENCES

5. ScopusGoogle Scholar