

The effect of yoga practice on heart circulatory system

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■ ABSTRACT

The cardiovascular diseases are much on a rise ever since the past few decades in developing countries. This study was done to analyze the effect of yoga on cardiovascular and mental status in normal adult person above the age of 40 years. 50 healthy men above the age of 40 years performing yoga regularly were included in the study. The heart circulatory status was assessed by recording the blood pressure and pulse rate, before and after 6 months of regular yogic practice. On analyzing the effects of yoga in normal subjects above the age of 40 years, in the present study, it is found that there is a highly 6 months of yogic practice. The mean pulse rate (beats/min) before yoga was 89.5 ± 4.72 , which reduced significantly to 76.78 ± 4.26 after 6 months of yogic practice ($p < 0.001$). The mean resting systolic blood pressure (mm Hg) before yogic practice was 138.25 ± 4.71 and after 6 months, it was lowered to a highly significant ($p < 0.001$) level of 120.05 ± 3.40 . The mean resting diastolic blood pressure (mm Hg) before yoga was 83.6 ± 6.10 and reduced significantly ($p < 0.001$) to 76.4 ± 6.35 . On the basis of results, yogic practice can be used as an intervention in ageing persons to reduce the morbidity and mortality from heart circulatory diseases.

■ **Key Words** : Heart circulatory diseases, Normal adult person, Yoga practice

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The blood pressure is measured with an instrument called a sphygmomanometer in millimeters of mercury. Hypertension is a medical condition in which the pressure of the blood pushing against the blood vessel walls is persistently high. The highest pressure reached during each heart beat is known as systolic pressure. The first gives the pressure of the contraction of the heart as it pushes the blood on its journey through the body and indicates the activity of the heart. The second represents the pressure present in the artery when the hearts is relaxed and shows the condition of the blood vessels. The blood pressure is considered normal when it is 120/70, but may go up to 140/90 and still be normal. Within this range, the lower the reading, the better. Blood pressure between 140/90 and 160/95 is considered border line area. From 160/96 to 180/114, it is classed as moderate hypertension, while 180/115 and upwards is considered

severe. A raised diastolic pressure is considered more serious than raised systolic pressure as it has a serious long term effect (H.B.P.). Regular practice of a variety of yoga techniques have been shown to lower heart rate and blood pressure in various populations (Kavalayananda, 1968 and Lakshmikanthan *et al.*, 1979).

Hypertension is a major health issue affecting approximately <10 per cent of population up to age of 30 years and >50 per cent of population after the age of 60 years. In the early 1970's, the rule of halves suggested that only < 50 per cent of the people who were hypertensive were diagnosed, and of those cases that were diagnosed, only 50 per cent received appropriate treatment and from those less than half achieved adequate control of their blood pressure. Thus the percentage of patients with hypertension who were adequately treated hardly reached 12-15 per cent.

Many studies show that yoga can be a very effective and non-invasive way of reducing high blood pressure. It is particularly effective in reducing the diastolic number – which is the most important. It is suggested that people with high blood pressure should only practice certain asanas (postures), whilst acknowledging that there are other asanas that are not suitable for them. The yogic practices of meditation and pranayama (breathing exercises) are also particularly beneficial for people who suffer from high blood pressure.

People with high blood pressure are admonished to be cautious in approaching exercise. This is generally because vigorous exercise puts stress on the cardiovascular system, including raising heart-rate and blood pressure. Before engaging in any sort of exercise program, including yoga of any type or variety, people with any sort of cardiovascular condition including high blood pressure should consult their physician. However, yoga asanas are not considered to be cardiovascular exercises as such.

Research also indicates that shoulder stand is particularly effective as the pose calms the body, “lowering blood pressure by clamping down on the carotids effectively making the local pressure very high. This sends a message to the parasympathetic system, which assumes that the brain tissues are suffering from too much blood, and orders the heart and circulatory system to compensate with pressure cuts (Bharshankar *et al.*, 2003, Anand *et al.*, 1961, Gopal *et al.*, 1973 and Gribbin *et al.*, 1971).

The word yoga comes from the same Sanskrit root as the word for yoke, it implies harnessing oneself to a discipline or a way of life. Suggested treatment for this disease can involve drugs and dietary modifications, quitting smoking, and stress reduction (Tiwari, 1983).

Keeping this in view, the present study was carried out to assess the effect of yoga practice on heart circulatory system.

■ METHODOLOGY

The main object of this study was to determine the effect of yoga practice on heart circulatory system. The following procedure and statistical analysis has been adopted.

Sample :

50 healthy men above the age of 40 years performing yoga regularly and they were included in the study. The health of the subject was assessed by history and clinical examination. The same subjects were chosen as both study and control group

in order to minimize the confounding factors. Study group included 50 subjects (mean age in years 48.04 ± 6.834), randomly selected from the Yoga centre of shyam Sadhanalaya, Ayodhya, Faizabad, performing “Yoga” *i.e.* ‘Asana’ (postural exercises), ‘Pranyamas’ (breathing techniques), and savasana’ (meditation), under proper supervision of the expert.

Tool :

The control group consisted of 50 subjects (mean age in years 46.4 ± 4.327) from the non-teaching staff members of department of physical education who were not doing yoga or any type of physical exercise on regular basis. On detail history, all subjects were nonalcoholic, non-smoker, not taking any drug and were having similar dietary habits, physical and mental activities in working and home atmosphere. They were subjected to clinical examination and found healthy. A written consent was obtained.

Procedure :

The following parameters were measured before the start of yogic training : Age, weight, height, pulse rate and blood pressure (BP). Before recording the above parameters, the subject was asked to relax too physically and mentally for 30 minutes.

Statistical analysis :

Data on physical characteristics was obtained such as age. Height and weight which was showing on significant difference in between yoga and control group when subjected to ‘t’ test (Table 1). The blood pressure was then recorded with a mercury sphygmomanometer. Resting blood pressure was recorded in left arm in supine position by auscultator method. Three readings were taken after the time interval of 15 minutes and average was taken as final reading. All the subjects were investigated by the same person under similar conditions of rest and fasting.

■ OBSERVATIONS AND DISCUSSION

Fifty subjects who practiced yoga for 6 months regularly were analyzed for the results. The results obtained are expressed as mean \pm standard deviation. The age of subjects was above to the 40 years. The mean age being 48.04 ± 6.83 years (Table 1). On analysis of the physical characteristics of the 50 subjects, the mean height (cm) was 176.08 ± 4.32 and

Physical characteristics	Control (Mean \pm SD)	Experimental (Mean \pm SD)	‘t’-value	‘P’ value
Age (in years)	46.4 \pm 4.32	48.04 \pm 6.83	1.26	P>0.05*
Height (in cm)	174.12 \pm 3.70	176.08 \pm 4.32	2.05	P>0.05*
Weight (in Kg)	94.22 \pm 3.37	80.64 \pm 5.59	14.73	P<0.001**

* and ** indicates of significance of values at P=0.1 and 0.05, respectively

Table 2 : The comparison of heart circulatory characteristics between the control and experimental group

Characteristics	Control (Mean \pm SD)	Experimental (Mean \pm SD)	't'-value	'P' value
Pulse rate	89.5 \pm 4.72	76.78 \pm 4.26	14.96	P>0.001**
SBP (mm of HG)	138.25 \pm 4.71	120.05 \pm 3.40	15.03	P>0.001*
DBP (mm of HG)	83.6 \pm 6.10	76.4 \pm 6.35	5.80	P<0.05*

* and ** indicates of significance of values at P=0.1 and 0.05, respectively.

the mean weight (kg) was 80.64 \pm 5.59 (Table 1).

Pulse rate :

The mean pulse rate (beats/min) before yogic practice was 89.5 \pm 4.72. It reduced highly significant to 76.78 \pm 4.26 (p<0.02) after 6 months of practice. Statistical analysis was done by 't' test.

Systolic blood pressure :

The mean resting systolic blood pressure (mm Hg) before yogic practice was 138.25 \pm 4.71. After 6 months of practice, systolic blood pressure (SBP) reduced to a highly significant level of 120.05 \pm 3.40 (p<0.01). Statistical analysis was done by 't' test.

On analyzing the effects of yoga in normal subjects above the age of 40 years. In the present study, it is found that there is a highly significant reduction in the pulse rate, systolic and diastolic blood pressure after 6 months of yogic practice. Yoga significantly improves levels of stress and anxiety but that these improvements were not any greater those of the relaxation group (Smith *et al.*, 2007). Furthermore, a study that focused on the effect of yoga on stress, Body mass index, heart rate and blood reassurance among hypertensive patients found that yoga practices are associated with decreased B.P., practitioner did yoga three times per week for eight weeks. There was also a control group that received information about hypertension but no yoga instruction. Stress was measured with the Stress Assessment Questionnaire, and blood pressure information was taken from medical records. The study found a significant difference between the stress scores of the experimental and control group at the conclusion of the study even though there was no baseline difference from the second to the eighth week. Prior to the yoga treatment, the mean blood pressure was 160.89/98.52, and at the conclusion of the eighth week it was 136.04/81.01. This supports the claims that yoga acts as an effective treatment for hypertension through the + reduction of stress (Swamy, 1968; Bernardi *et al.*, 2002 and Dattey *et al.*, 1969). Many research studies have documented the usefulness of yoga in the treatment of various lifestyle related diseases especially heart circulatory disease.

A significant improvement in the levels of blood pressure, LDL cholesterol and body mass index after 3 months residential training consisting of vegetarian diet and Kriya

yoga (Swami Satyananda Saraswati, 2001).

Conclusion :

Many research studies have documented the usefulness of yoga in the treatment of various lifestyle related diseases especially heart circulatory disease. In our test we have found this and it is proved that yoga has significant and healthy impact on our life style.

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