

EFFECT OF SHORT TERM YOGA TRAINING ON CARDIO-VASCULAR PARAMETERS

Authors

1. Dr. Hansa N. Parikh – Assistant Professor
2. Dr. Shruti J. Shah – Assistant Professor
Department of Physiology
Medical College Baroda
Vadodara, Gujarat-390001

Abstract

Background and objective:

Yoga-originally viewed as a life style, is now recognized as a therapy with tremendous applicability in presentation and promotion of physical, mental, emotional ,intellectual and spiritual health.

Regular practice of yoga integrates the mind and body. It produces many systemic psycho-physical effects in the body, in addition to its specific effects on cardiovascular system.

The aim of the present study was to assess the beneficial effects of yoga in the improvement in the cardiovascular functions of young healthy adults.

Methods: The study group consisted of 30 young adults (19 males and 11 females) who were students of first year MBBS, Medical college, Baroda.

They were motivated to participate in yoga workshop for one hour daily for four weeks. The first phase of recording of cardiac parameters was done at beginning of their course. The second phase of recording of cardiac parameters was done after 4 weeks of regular yoga practice. The data was analysed using students paired 't' test.

Results:

Participants had a mean age of 17.81 ± 0.48 years, height of 164.21 ± 5.09 cms., weight of 54.34 ± 5.63 kgs.

The pulse rate before yoga practice showed a mean value of 88.94 ± 7.58 and after, it showed a mean value of 78.87 ± 5.18

The systolic blood pressure (mmHg) - before yoga practice showed a mean value of 117.27 ± 10.78 , after yoga practice showed a value of 108.60 ± 8.64

The diastolic blood pressure (mmHg) - before yoga practice showed a mean value of 81.13 ± 9.03 , after yoga practice showed a mean value of 74.73 ± 6.56

Pulse pressure (mmHg) -before yoga practice showed a mean value of 35.80 ± 8.60 , after yoga practice showed a mean value of 33.87 ± 5.86

For pulse rate, systolic blood pressure, diastolic blood pressure - a p value of <0.001 was considered as a highly significant while Pulse pressure was not statistically significant.

Conclusion: There was a statistically significant decrease in all the above cardiovascular parameters in the regular yoga practice. This study proposes that regular practice of yoga can improve health related aspects of physical fitness and general well being.

Key words- yoga , cardiovascular parameters (PR, SBP, DBP, PP)

Introduction

Yoga is the best life style modification which aims to attain the unity of mind ,body &spirit through asanas (exercise) , pranayama (breathing)& meditation.*1

Exercises in different forms , if performed regularly , have a beneficial effect on various systems of the body. Breath is a dynamic bridge between body& mind , pranayam is the art of prolongation& control of breath, helps in bringing conscious awareness to breathing & the reshaping of breathing habits & patterns*2

practice of yoga appears to be helpful in decreasing subjective feelings of anxiety , improving physical fitness and providing mental relaxation. It can lower Blood pressure , Heart rates and has been found helpful in patient with cardiac diseases. It tries to balance the sympathetic and parasympathetic activities of autonomic nervous system. Four weeks of nadisudhhi pranayama has shown significant decrease in pulse rate, systolic& diastolic blood pressure, along with significant increase in pulse pressure.*3

During OM meditation there was a significant reduction in heart rate as compared to control period in which non targeted thinking was encouraged.*4,5

The aim of present study was therefore, to assess to beneficial effects of yoga in the improvement and strengthening of cardiac functions. In this study we tested the hypothesis that a 4 week yoga training program improves cardiac functions in healthy young adult subjects.

subjects and methods

The present study was carried out in the department of physiology in medical college Baroda.

A group of 30 medical students of first year M.B.B.S. was randomly selected since age, height, weight affect cardiac function tests, following criteria were used for selection of subjects

Inclusion criteria

- Subject were from the age group of 17 to 19 years
- The height of all subjects was ranged from 150 to 175 centimetres
- The weight of all subject ranged 40 to 65 kilograms

Exclusion criteria

- Students who are doing yoga regularly
- students not coming for regular yoga training
- The students who were having history of any other major illness e.g. hypertension, diabetes mellitus, heart disease etc.
- Chest deformities like kyphosis , scoliosis.

Systemic disease and cardiac disorders were ruled out in the selected subjects by taking their detailed history and by their clinical examination

Depending on the inclusion/exclusion criteria , the number of subjects finally taken is 30. Out of 30 students 19 were males and 11 were females. The subject were explained the purpose and importance of the study. They were motivated to participate in the present work only prior consent was taken for participation in research and yoga workshop

Cardiac parameters was taken prior to yoga workshop and data collection for the same parameters was taken after one month of yoga practice.

Pulse rate per minute (PR)

Systolic blood pressure in mmHg (SBP)

Diastolic blood pressure in mmHg (DBP)

Pulse pressure in mmHg (PP)

All the above test were done at the same time of the day i.e between 7 to 8 a.m. to avoid diurnal variation. The result of cardiac function tests before and after yoga therapy were compared and statistically analysed using students T - test.

Subjects used to perform yogasana for one hour (7 to 8 a.m.) a day. The yogic curriculum included prayers followed by chanting 'om', pranayama, meditation and different asanas i.e. different physical postures. The asanas performed at the yoga workshop were as follows

- sukhasana
- padmasana

- chakrasana
- shavasana
- makarasana
- bhujangasana`

Methods

All the parameters were taken with the subjects in sitting position. . The tests were done in quite room in order to eliminate emotional and psychological stresses

Pulse Rate (PR) - The pulse rate was recorded for 1 minute by palpating the right radial artery of the subject at wrist by applying there middle fingers of the right hand.

Blood pressure (SBP,DBP,PP) - Blood pressure was recorded over right brachial artery at the level of cubital fossa by using sphygmomanometer. The systolic and diastolic blood pressure were recorded by auscultatory method. Pulse pressure was calculated as difference between systolic and diastolic blood pressure.

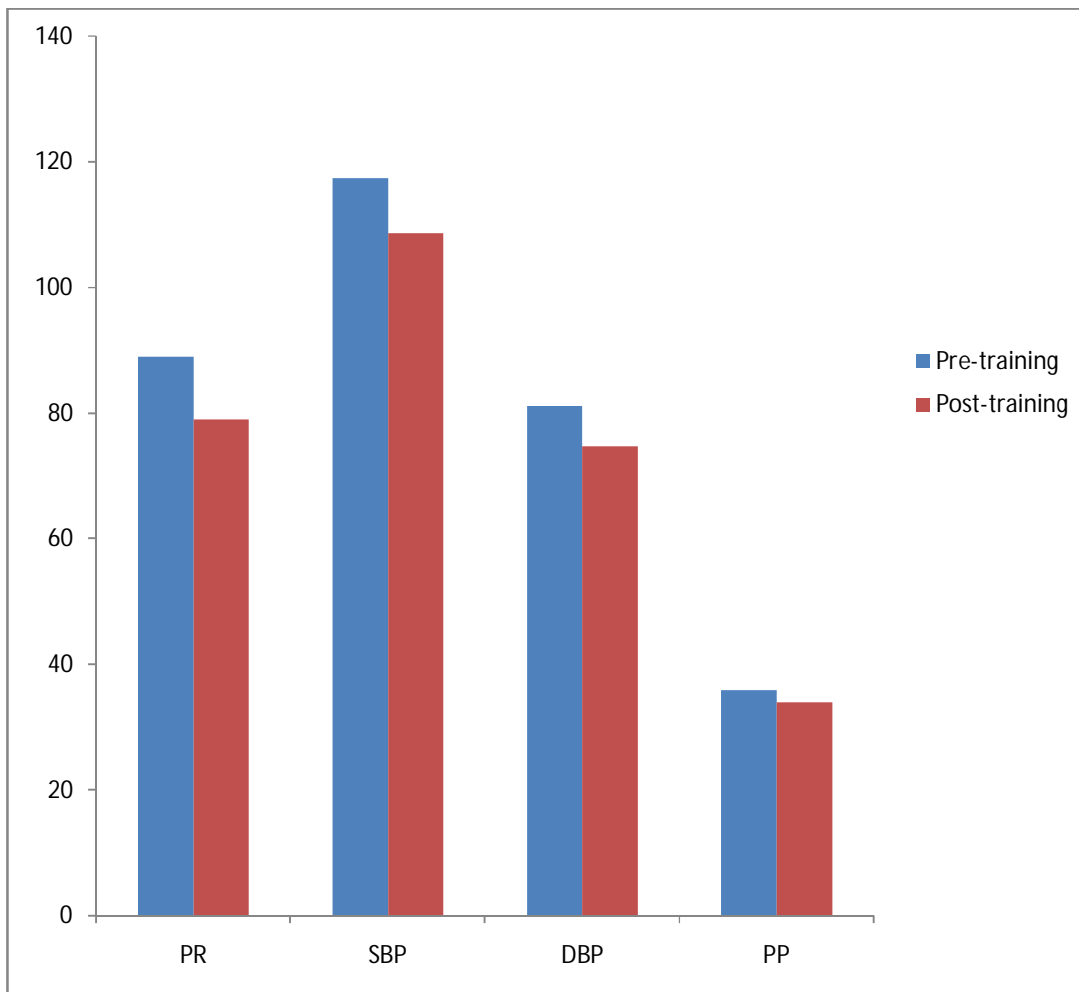
RESULTS

Parameters	Male (n = 19)	Female (n = 11)	Total (N = 30)
Age (Years)	17.89 (17-19) ±0.46	17.64 (17-18) ±0.50	17.81 (17-19) ±0.48
Height (Cms.)	166.95 (159-174) ±3.60	159.45 (152-164) ±3.59	164.21 (152-174) ±5.09
Weight (Kg.)	57.34 (49-64) ±4.25	49.14 (42.5-54) ±3.56	54.34 (42.5-64) ±5.63

Table 2 showing mean and SD values of cardiovascular parameters before and after Yoga training (N=30)

Parameters	Before training	After training
Pulse rate (per min)	88.94 ±7.58	78.87 ±5.18
Systolic blood pressure (mmHg)	117.27 ±10.78	108.60 ±8.64
Diastolic blood pressure (mmHg)	81.13 ±9.03	74.73 ±6.50
Pulse pressure (mmHg)	35.80 ±8.60	33.87 ±5.86

Histogram showing changes in PR, SBP, DBP, AND PP after yoga training (N=30)



PR = Pulse rate per min. , SBP = Sysolic Blood pressure in mmHg, DBP = diastolic blood pressure in mmHg and PP = Pulse pressure in mmHg

Thirty healthy volunteers medical students were subjects for the present study. Of these 19 were males and 11 were females.

Their age range between 17 and 19 years (mean value = 17.81) , height between 152 and 174 cms (mean value = 164.21) and weight between 42.5 and 64 Kg (mean value = 54.34). These are shown in Table 1.

Each subject acted as his own control. Comparing cardio-vascular parameters before and after yoga training (Table 2) it can be seen that there is highly significant reduction in heart rate (from mean value of 88.94 ± 7.58 to 78.87 ± 5.18 , $p < 0.001$), systolic blood pressure (from mean value of 117.27 ± 10.78 to 108.60 ± 8.64 , $p < 0.001$) and diastolic blood pressure (from mean value of 81.13 ± 9.03 to 74.73 ± 6.50 , $p < 0.001$). Pulse pressure though reduced , was not statistically significant

Discussion

Effect of practice of yogasan and meditation (yoganidra) for one hour daily for a period of one month was studied on cardiac parameters in 30 medical students. Each subject acted as its own control. The results obtained are discussed as under:

Cardiac parameters .

Discussion

Pulse rate: our study showed statistically significant reduction in pulse rate after practice of yoga, similar finding have reported by other workers after short term yoga training. (A.A KHANAM ET AL(1996)*6., Kaviraja udupa et al(2002)*7., Jyotsana Bharashanker et al(2003)*8 and it is attributed to increased vagal tone & decreased sympathetic activity.*9,10

(Pathak&palan(1997) reported significant reduction in pulse rate in normal & psychosomatic subjects

After one month of yoga practice.*11)

Similar finding decrease pulse rate observed by (vinayak.p.doijad&et al(2012)*11 after short term yoga practices.

And Ankad.RB et al(2011)*12 after short term pranayam & meditation.

Blood pressure :In present study we observed highly significant reduction in systolic blood pressure, & diastolic blood pressure. decreased in pulse pressure is not statistically significant after yoga practice.

Similar finding observed decreased in blood pressure after yoga practice by other reasearchers are;

., Jyotsana Bharashanker et al(2003)*13 Gandhi et al(2006)*14

Kalwale p.k, shete A.N et al (2006)*15 observed decreased systolic blood pressure after one month of pranayama training but no change in diastolic blood pressure.

Josheph et al (1981)*16 in their study showed significant reduction in systolic & diastolic blood pressure after pranayam & meditation.

(Pathak&palan *18 showed decreased in systolic & diastolic blood pressure after practice of yoga for one month.) vinayak.p.doijad&et al(2012)*17 observed decreased systolic & diastolic blood pressure after short term yoga practice. And Ankad.RB et al(2011)*18 showed similarly decreased systolic & diastolic blood pressure after short term pranayama& meditation

Summary and conclusion:

Yoga is considered as more holistic and comprehensive tool to bring and maintain a perfect homeostasis in psychological and physiological functioning. The present study was aimed to study efficacy of some yogic techniques in bringing alterations in physiological functioning of cardiac parameters in normal healthy volunteers. The subjects selected for the study were medical students of 1st year M.B.B.S., medical college , Baroda.

Subjects were given a scheduled yoga training (Appendix - 1) for one month. Their basal physiological data - cardiac parameters like; Pulse rate (PR) , Blood pressure (Systolic -SBP, Diastolic -DBP, Pulse pressure-PP)were taken before training. Following the yoga training post training data of the same parameters was taken and compared with previous data to analyse the efficacy of one month training.

Individual measurements of each subjects are depicted in master tables- . Statistical analysis with the help of paired 't' test was done between pretraining and post training data. Results of statistics are showed in tables. Histograms of the same are also exhibited.

The results may be summarised as under:

1. Significant reduction in Pulse rate (PR). 2. Significant reduction in Systolic blood pressure (SBP) and Diastolic blood pressure (DBP) , but no significant change in pulse pressure.

It can be concluded that yoga brings biological harmony and better health (cardiac endurance) proving its efficacy in homeostasis.

These effect of yoga is considered to be on Autonomic nervous system (ANS) - decreasing the sympathetic tone and increasing or optimizing parasympathetic activity and thereby reducing blood pressure and heart rate.

Several workers have explained mechanism of reduction in pulse rate and blood pressure as an effect of yoga practice. according to Datey (1975) yoga raises the arousability of cerebral cortex and help in decrease of impulses to hypothalamus , decreasing sympathetic tone thus causing decrease in pulse rate and heart rate .

Gopal et al (1973)(19) suggested that decrease in pulse rate upon practice of yoga is probably due to increase or optimization of parasympathetic activity while decrease in blood pressure may indicate decrease sympathetic tone and peripheral resistance. Datey et al (1969), and Udupa(20) and Singh (1972) also suggested that yogic practices decrease heart rate probably due to increase vagal tone together with decrease sympathetic discharge.)

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