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Original Research Article

Study of Effect of Meditation on Hear Rate and Blood Pressure in Healthy Individuals

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Abstract

Meditation produces various effects on human physiology, which are mediated via autonomic nervous system. Meditation is a simple and scientific technique to elicit physical and mental relaxation response, to change one's attitude and transform life-style. Regular practice of it brings transformation in overall wellbeing of person. The cardiovascular morbidity is increasing in India in recent years. The present study was done to know the effect of meditation on heart rate and blood pressure in healthy volunteers above the age of 35 years. The cardiovascular status of the subjects was assessed clinically in terms of resting heart rate and blood pressure before the start of meditation practice and again after 4 months of practice of meditation. The results were compared and analysed.. From the study it was observed that significant reduction in the heart rate occurs in the subjects practicing meditation ($P < 0.001$). The systolic blood pressure was lowered to a highly significant level ($P < 0.001$). The diastolic blood pressure was reduced significantly ($P < 0.001$). This shows that the yoga provides significant improvement in ageing to reduce the morbidity and mortality from cardiovascular diseases. Meditation provides significant improvements in physiological cardiovascular functions by tilting of autonomic balance from sympathetic in favour of parasympathetic.

Keywords: Meditation, Blood Pressure, Heart rate.

INTRODUCTION

Meditation is a complex phenomenon that involves several coordinated, cognitive processes and autonomic nervous system alterations. Meditation as a form of therapy may facilitate positive effect resulting in a sense of physical and mental well being in patients [1]. Meditation has entered the mainstream of health care as a method of stress and pain reduction. In the recent years there has been a growing interest within the medical community to study the physiological effects of meditation [2-5]. Meditation is recognised as a calm state of mind with parasympathetic dominance in the body Regular meditators may experienced a calm & hypo-metabolic state with parasympathetic dominance. Some studies shows beneficial effects in controlling blood pressure in hypertensives. The meditation is the method of extending our ordinary consciousness and thereby discovering more about ourselves. When we gain this insight, we can change our habits and our deeper, inner personality has a better chance to show through. Our whole life changes for the better. Meditation is the technique of turning down the brilliance of the day so that the subtle sources of energy can be perceived within. Meditation has always been a subject of intense exploration amongst scientists. It has been stressed that the physiology of meditation differs from that of ordinary rest with eyes closed and from that of most hypnotic states. Further, during meditation, deep physiological relaxation, somewhat similar to that occurring in the "deepest" non-rapid-eyemovement (NREM) sleep phase occurs in a context of wakefulness [6]. Wallace *et al*., termed meditation a "wakeful, hypometabolic state of parasympathetic dominance" [7]. A vast complexity of biological organization indicates that the physiological response to meditation probably occurs on a multidimensional, interactive basis. Further, meditation produces specific neural activation patterns involving decreased limbic arousal in the brain, which in turns results in reduced stress and increased autonomic stability. Role of different clinical reflexes to assess functions of autonomic nervous system in clinical conditions like borderline hypertension has been documented [8]. Present study was aimed to assess the effect of meditation on blood pressure and heart rate.

MATERIALS AND METHODS

40 healthy volunteers above the age of 35 years and below 65 years performing meditation regularly were included in the study. All the volunteers

were clinically examined to rule out any systemic diseases. The study protocol was explained to the subjects and written consent was obtained. The same subjects were chosen as both study and control group in order to minimize the confounding factors. Before recording the parameters, the subject was asked to relax physically and mentally for 30 minutes. The blood pressure was recorded with the sphygmomanometer in supine position in the right upper limb by auscultatory method. Similarly, three readings were taken at an interval of 15 minutes each and average of the three values calculated .Heart rate was counted for one minute. The subjects were trained under the guidance of a certified yoga teacher. They carried out meditation for 4 months for 1 hour daily between 6 am and 7 am. The cardiovascular status of each subject, after 4 months of meditation practice was assessed clinically in terms of blood pressure and heart rate recordings. Statistical analysis was done by t test.

RESULTS

40 subjects who practiced meditation for 4 months regularly were analysed for the results. The results obtained are expressed as Mean ± SD. Table below shows changes in Blood Pressure, Heart rate before starting of meditation practice and after 4 months of daily meditation for one hour.

Table-1: Values of HR and SBP &DBP before and after practice of meditation

Variable	Before starting of meditation practice	After 4 months of daily practice of yoga	P value
Heart rate (bts/min.)	76.4 ± 5.8	71.3 ± 5.2	<0.001**
SBP(mmHg)	130.4 ± 10.2	120.5 ± 5.9	<0.001**
DBP(mmHg)	82.6 ± 6.8	76.6 ± 7.3	<0.001**

** Highly significant

Above tables shows that Mean resting heart rate before meditation practice was 76.4 ± 5.8. It reduced to 71.3 ± 5.2 after 4 months of practice of meditation and it was statistically significant P <0.001.

The mean systolic blood pressure [SBP] before meditation practice was 130.4 ± 10.2. After 4 months, of meditation practice, systolic blood pressure reduced to 120.5 ± 5.9 and it was statistically significant P <0.001.

The mean diastolic blood pressure [DBP] before meditation practice was 82.6 ± 6.8. After 4 months, of meditation practice, diastolic blood pressure reduced to 76.6 ± 7.3 and it was statistically significant P <0.001.

DISCUSSION

The mean values of heart rate, systolic blood pressure and diastolic blood pressure are highly significant reduction after 4 months of meditation practice. Reduction in heart rate and blood pressure indicate a shift in the balancing components of autonomic nervous system towards the parasympathetic activity which was reported by Santha Joseph *et al*., [9] and Anand BK *et al.*, [10]. This modulation of autonomic nervous system activity might have been brought about through the conditioning effect of meditation on autonomic functions and mediated through the limbic system and higher areas of central nervous system was reported by Selvamurthy *et al.*, [11]. Regular practice of meditation increases the baroreflex sensitivity and decreases the sympathetic tone, thereby restoring blood pressure to normal level in patients of essential hypertension was reported by Vijaya Lakshmi *et al.*, [12]. Meditation by modifying the state of anxiety reduces stress – induced sympathetic over activity thereby decreasing arterial tone and peripheral resistance, and resulting in decreased diastolic blood pressure and heart rate. This ensures better peripheral circulation was reported by Bhargava *et al*., [13] and blood flow to the tissues reported by Gopal *et al*., [14]. Some research shows an elevated beta-endorphin levels in persons doing regular meditation that may be responsible for relaxed & calm state of regular meditators & it also boost immunity [15]. Further researches are undergoing in meditation physiology to unearth rest of the benefits.

CONCLUSION

Non-pharmacological methods like yoga, meditation, diet, weight reduction and life style modification should been couraged to control the modifiable risk factors. The cardiovascular parameters alter with age, but these alterations are slower in persons ageing with regular meditation practice. It can thus be concluded that these results and their explanations would justify the incorporation of yoga and meditation as part of our life style in prevention of age–related cardiovascular complications. The results of this study demonstrated a reduction in systolic blood pressure, diastolic blood pressure indicating parasympathetic nervous system dominance during & immediately after meditation.

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