Meditation produces various effects on human physiology, which are mediated via autonomic nervous system. 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 up. 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>
<thead>
<tr>
<th>Variable</th>
<th>Before starting of meditation practice</th>
<th>After 4 months of daily practice of yoga</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate (bts/min.)</td>
<td>76.4 ± 5.8</td>
<td>71.3 ± 5.2</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>130.4 ± 10.2</td>
<td>120.5 ± 5.9</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>82.6 ± 6.8</td>
<td>76.6 ± 7.3</td>
<td>&lt;0.001**</td>
</tr>
</tbody>
</table>

** 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 Selvanurthy 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.

**REFERENCES**


