SHORT COMMUNICATION

EFFECT OF SHORT-TERM AND LONG-TERM BRAHMAKUMARIS RAJA YOGA MEDITATION ON PHYSIOLOGICAL VARIABLES

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Abstract: Effect of short-term and long-term Brahmakumaris Raja Yoga meditation on physiological variables like heart rate (HR), respiratory rate (RR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) was evaluated in 100 subjects practicing Raja Yoga meditation. All 100 subjects (33 men and 67 women) were aged 30 years and above (mean age 52.06±12.76 years). Short-term meditators (STM) (n=27) practiced Raja Yoga meditation for duration of six months to five years (mean duration 3.37±1.67 years) and long-term meditators (LTM) (n=73) practiced Raja Yoga meditation for more than five years (mean duration 11.19±5.13 years). The participants were asked to meditate and the physiological variables (HR, RR, SBP and DBP) were recorded twice (15 minutes and 30 minutes) after beginning of meditation. Also, the fasting blood sugar was estimated by glucometer. The study subjects did not differ significantly in age and various anthropometric characteristics such as body weight, body mass index, waist-hip ratio and fasting blood sugar. Comparison between STM and LTM showed that the changes from baseline values (from pre-meditation to post-meditation at 15 and 30 minutes) in LTM were not statistically significant with those in STM (P>0.05). However, within group differences in LTM revealed that changes in the physiological variables were statistically significant when compared between pre and post meditation both at 15 and 30 minutes. The study suggests that the long-term practice of Raja Yoga meditation improves basic cardio-respiratory functions due to shifting of the autonomic balance in favor of parasympathetic instead of sympathetic system.

Key words: meditation brahmakumaris raja yoga

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
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).

Raja Yoga meditation as taught in the Brahmakumaris World Spiritual University (also known as Prajapita Brahmakumaris Ishwariya Vishwa Vidyalaya) is a behavioral intervention which is simple to practice, as no fixed physical postures are to be adopted. It is an art with scientific, psychological, intellectual and spiritual process, which enables invisible latent powers and capabilities to emerge from the inner recesses of heart and mind. It aims at establishing balance in head, heart and hand. It is the science and art of harmonizing spiritual, mental and physical energy through the connection with the ultimate source of spiritual energy, the Supreme Soul for enjoying ever healthy, ever-wealthy and ever-happy life (6).

Regular practice of Raja yoga meditation causes improvement in physiological parameters. The longer the duration of meditation, more are the changes. This study was performed with the objective of assessing the effect of short term and long term Brahmakumaris Raja Yoga meditation on physiological variables.

**MATERIALS AND METHODS**

A cross-sectional study was carried out at Brahmakumaris centre in Nagpur city. The study period was from 1\textsuperscript{st} January 2010 to 30\textsuperscript{th} June 2010. The present study was carried out in 100 study subjects (33 men and 67 women) in the age group of 30 years and above (mean age 52.06±12.76 years) visiting the Brahmakumaris centre and practicing Raja Yoga meditation at least for a period of six months. The Institutional Ethics Committee, Directorate of Annamalai University Madurai, approved the study. All study subjects aged 30 years and above were interviewed in the morning hours (between 7 am and 8.30 am) after obtaining the informed consent from them and detailed history regarding demographic profile, socio-economic status, presenting complaints, if any, past history, personal history as well as information regarding Raja Yoga meditation practice was obtained. Those subjects practicing Raja Yoga meditation from six months up to five years were classified as short-term meditators (STM) (mean duration 3.37±1.67 years) and those practicing Raja Yoga meditation for more than five years were classified as long-term meditators (LTM) (mean duration 11.19±5.13 years). During meditation, subjects sit in a comfortable posture with their eyes open, and with gaze fixed on a meaningful symbol (a light). At the same time, they actively think positive thoughts about a universal force pervading all over, as light and peace. The meditators were practicing Raja Yoga meditation for one hour every morning (6-7 am) at the Brahmakumaris centre. Complete clinical examination, including general and systemic examination was done. Anthropometric measurements (height, weight, waist circumference and hip circumference) were recorded. High waist - hip Ratio (WHR) is considered as > 1 for males and > 0.85 for females (7).

Heart rate (HR), respiratory rate (RR), systolic blood pressure (SBP) and diastolic
blood pressure (DBP) were recorded before meditation practice. The purpose of experiment was explained to them in order to reduce unnecessary anxiety. Then, the subjects were asked to practice meditation for 30 minutes and again their HR, RR, SBP and DBP were measured twice at 15 minutes interval during the practice of meditation i.e. after 15 and 30 minutes. HR and RR were recorded per minute. BP was measured by mercury sphygmomanometer in the right arm in sitting position both before and twice during meditation practice. During recording due care was taken so as not to disturb the subjects in their meditation.

In addition, fasting blood sugar estimation was done using glucometer as per standards recommended by American Diabetes Association (ADA) (8). Because of its simplicity and availability, the ADA report recommends basing the diagnosis of diabetes mellitus (DM) on the fasting plasma glucose. Subject was considered as diabetic if he/she was a known case of DM or if his/her fasting- blood sugar was 120 mg/dl or more (9).

Statistical analysis

Data was analyzed by statistical software STATA version 10.1 (2009). Within group differences in STM and LTM were analyzed by one-way analysis of variance and multiple comparisons were performed by Bonferroni test. For between group differences, changes from baseline values (from pre to post meditation) were compared between STM and LTM by t test for independent sample. Statistical significance was assessed at a type I error rate of 0.05.

RESULTS

The mean age of the study subjects in the two groups i.e. STM and LTM was 49.37±11.95 years and 53.05±12.98 years, respectively. The study subjects in the two groups did not show statistically significant difference in age and anthropometric characteristics such as body weight, body mass index (BMI), waist-hip ratio (WHR) and fasting blood sugar level (FBS) (Table I).

Physiological variables pre and post meditation between STM and LTM are shown in Table II. Mean HR, RR, SBP and DBP were found to be lower during post-meditation period (after 30 minutes) as compared to during meditation period (after 15 minutes) and pre-meditation period. Within group differences analysis in STM showed that none of the physiological variables between pre and post meditation period were statistically significant except RR, which was found to be significantly lowered during post meditation after 30 min as compared to pre-meditation period. However in case of LTM, the changes in

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Short-term</th>
<th>Long-term</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>49.37±11.95</td>
<td>53.05±12.98</td>
<td>0.20</td>
</tr>
<tr>
<td>BW (kg)</td>
<td>60.48±14.69</td>
<td>55.41±11.87</td>
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<tr>
<td>BMI (kg/m²)</td>
<td>23.44±4.28</td>
<td>22.91±4.36</td>
<td>0.58</td>
</tr>
<tr>
<td>WHR</td>
<td>0.87±0.05</td>
<td>0.86±0.08</td>
<td>0.54</td>
</tr>
<tr>
<td>FBS</td>
<td>108.66±33.35</td>
<td>112±49.56</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Data are presented as mean±SD. BW: body weight; BMI: body mass index; WHR: waist-hip ratio; FBS: fasting blood sugar. The difference between STM and LTM not statistically significant P>0.05 by student’s t test.
physiological variables between pre and post meditation period at 30 minutes were found to be statistically significant (P<0.01). Between groups differences showed that the changes from baseline values (from pre-meditation to post-meditation at 15 and 30 minutes) in LTM were not found to be statistically significant with the changes from baseline values in STM (P>0.05).

**DISCUSSION**

The study emphasizes the effect of short term and long term Brahmakumaris Raja Yoga meditation on physiological variables during meditation as compared to the pre-meditation period. Significant decrease in physiological variables observed in long term meditators after meditation indicates a shift in the balancing components of autonomic nervous system towards the parasympathetic state.

Sympathetic arousal is expected to be reduced during Raja Yoga practice. Hence the load on heart due to sympathetic arousal is also minimized resulting in an improvement in cardiovascular parameters. Similar findings as in our study were observed in 23 subjects by Gupta S et al (10), attributing decline in HR, RR and BP to the reduction in the level of sympathetic arousal. Meditation is believed to gradually reduce the sympathetic dominance resulting in better balance between sympathetic and parasympathetic. This should bring about a hypometabolic state resulting in decreased heart rate and blood pressure (11). The reduction of lactic acid brought about by meditation as observed by Patel G (11) is supposed to be a sign of tension free and peaceful state of mind.

Vyasa R et al (12) observed that diastolic blood pressure was significantly lower in both short and long term meditators of Raja Yoga meditation as compared to non-meditators. Lipid profile showed a significant lowering of serum cholesterol in short and long-term meditators as compared to non-meditators. However contradictory results have been observed by Telles S et al (13), who conducted study in 18 males with 5-25 years of meditation (mean 10.1±6.2) showing that heart rate during the meditation period was increased when compared to the baseline period, as well as compared to the value during the non-meditation period of control sessions. No significant change was observed during meditation, for the group as a whole, in palmar GSR, finger plethysmogram amplitude and respiratory rate. Hence, a single model of sympathetic activation or overall relaxation may be inadequate to describe the physiological effects of a meditation technique.
Findings of our study suggest that dual model exist i.e. quietening of sympathetic system and activation of parasympathetic system during the meditation practice as indicated by the shift from sympathetic to parasympathetic resulting in decrease in physiological variables like HR, RR, SBP and DBP. Thus, Meditation by modifying the state of anxiety reduces the stress induced sympathetic over activity resulting in a lowering of respiratory and cardiovascular variables. It relaxes the subject and thereby decreases arterial tone and peripheral resistance. This may be another reason for a fall in blood pressure. This implies that Raja Yoga meditation confers significant benefits in respiratory functions; cardiovascular parameters which continued to improve further with long-term meditation (12). Moreover, the findings of our study also show greater and significant decrease in physiological variables among long-term meditators, which justifies the fact that long-term meditators have greater parasympathetic control.

Further scientific research on effects of Raja Yoga meditation on other physiological variables like lipid profile, palmar GSR, finger plethysmogram amplitude, skin resistance is needed to assess its beneficial effects. Hence we recommend that Raja Yoga meditation should be incorporated as the basis for an effective behavioral program in the management of diseases associated with lifestyle modification like hypertension, diabetes, coronary heart disease and cancers. For this, awareness needs to be created among masses regarding the positive health benefits of meditation.

REFERENCES

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