

## ORIGINAL ARTICLE

## PHYSIOLOGICAL EFFECT OF RAJYOGA MEDITATION ON CHRONIC TENSION HEADACHE AND ASSOCIATED CO-MORBIDITIES

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**Background:** Stress is the most common factor which causes Chronic Tension Headache (CTH). Yoga and Meditation are non-pharmacological therapies for the treatment of stress. This study aimed to evaluate the effect of Rajyoga meditation on CTH and related co-morbidities. **Methods:** One hundred patients having CTH were short listed for the study based on the International Headache Society Criteria II. Study group patients were taught Rajyoga meditation. Visual pain analogue scale (VAS) was used to assess the intensity of headache, before and after meditation. Anxiety and depression were assessed by Hamilton anxiety and depression scales. Student's *t*-test was used to compare the basal values for all the quantitative parameters between the two groups, and  $p < 0.05$  was taken as significant. **Results:** There was highly significant ( $p < 0.001$ ) reduction in intensity of pain in meditators. After 8 weeks, relief of headache in study group was 87% and it was 23% in control group. The improvement in frequency of headache was 86% in meditators and 23% in control group. The improvement in duration of headache was 93% in meditators and 32% in control group. Mean relief of Headache Index was 95% in meditators, whereas it was 34% in control group. The relief in anxiety was 92% in meditators and 34% in controls. Depression scores showed improvement up to 87% in meditators and 38% in control group. **Conclusion:** Rajyoga Meditation helps in decreasing stress hence reducing CTH and associated co-morbidities. Rajyoga meditation can be used as an adjunct to traditional therapy in management for CTH where co-morbidity is a major complication.

**Keywords:** Rajyoga meditation, Chronic tension headache, co-morbidity

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### INTRODUCTION

The commonest complaint encountered by physicians in their clinics is headache. Prevalence of the headache all over the world is 46% and that of tension type headache accounting is 42%.<sup>1</sup> Chronic tension headache (CTH) also known as stress headache is associated with 15 headache days every month for 6 months and is difficult to treat.<sup>2</sup> Clinical evidence suggests that depression and anxiety are strongly associated with CTH and a number of co-morbid mental disorders.<sup>3,4</sup> Patients of headache with co-morbidities like anxiety and depression have more negative prognosis. Although pharmacotherapy is commonly used for prophylaxis, it is associated with side-effects. Moreover, it has to be used with great caution in pregnant ladies and children.<sup>5</sup>

Relaxation response is used as an effective method to break the vicious cycle between pain and stress. Scientific research has shown that deep relaxation gained from meditation settles mind and body so that the nervous reactions to anxiety<sup>6</sup>, depression<sup>7</sup>, and stress<sup>8</sup> are lessened. Many studies have demonstrated the physiological effects of yogic practices and transcendental meditation in various diseases.<sup>9</sup> But we come across fewer studies in which Rajyoga or Rajyoga meditation has been used as a relaxation technique on CTH and associated anxiety and depression. We undertook this project to find the physiological effect of

Rajyoga meditation on psychiatric co-morbidities associated with chronic tension headache, i.e., depression and anxiety.

Rajyoga is a method of autogenic relaxation related mainly to mind and spirituality. It aims at realization of the true self; concentrating on the 'Supreme Lord'. Rajyoga is training course offered by an NGO, Rajyoga Education and Research Foundation of Brahma Kumaris World Spiritual University. It has consultative status with UNO, UNICEF and WHO.<sup>10</sup> Rajyoga meditation requires one only to stop negative and worldly thoughts and concentrate on the attributes of the supreme. As this yoga doesn't need use of any mantra, control over breathing, any physical postures or an image hence it is simple and easy to practice. In this study role of Rajyoga was considered as an additional non-pharmacological treatment in the management of headache and associated co-morbidities.

### SUBJECTS AND METHODS

The approval for this study was taken from the Ethical Committee of the Institute. One hundred patients aged 18 years and above, attending psychiatry out-patient clinic of a tertiary hospital, diagnosed of CTH with associated anxiety and depression were included. The patients suffering from headache were selected according to criteria based on Ad-hoc Committee of

Classification of Headache<sup>11</sup>. Patients with mild anxiety and depression were included in the study. Exclusion criteria were headache for less than 2 years, headache due to sinusitis, cervical spondylosis and eye strain, and post-traumatic headaches. Patients who were not regular with meditation practice were also excluded.

Methodology of the project was explained to the patients and they were emphasised to come for regular follow up and an informed consent was taken. On the first day demographic profile, the details regarding duration, frequency, and severity of their headache was noted. The visual pain analogue scale (VAS) was used to check intensity of headache at their first visit to hospital. The patients were randomly divided into two groups: meditators, i.e., study group (n=60), and non-meditators, i.e., control group (n=40). Patients in study group were taught Rajyoga meditation.

All subjects were on a similar drug regime. For study group, eight meditation sessions of 45 minutes each, were conducted on alternate days for two weeks. Then it was followed by interview once a week. Patients were instructed to do meditation for 20 minutes every morning and evening at their home and they were advised to record their daily routine in a diary. They were also given Brahma Kumari literature on positivity. During the interview the compliance of treatment and technique followed by the patients was counterchecked and queries relating to the methodology were answered. Non-meditators were also asked to report in order to check their treatment compliance. Headache index (HI) was calculated by multiplying frequency of headache and severity of headache. Hamilton anxiety<sup>12</sup> and depression<sup>13</sup> scales were used for measuring the severity of anxiety and depression. The data obtained were subjected to relative statistical analysis. Student's *t*-test was used to compare the quantitative parameters between the two groups, and *p*<0.05 was taken as significant.

## RESULTS

One hundred subjects entered the study, 60 in study group and 40 in control group. The patients in the two groups were comparable regarding age, sex, social and marital statuses, and duration of headache. Married women were more than men in both groups (Table-1).

The reduction in intensity of pain was highly significant (*p*<0.001) in study group. After 8 weeks, relief of headache was 87% in the study group. The improvement in control group after 8 weeks was merely 23%. There was 86% improvement in frequency of headache in study group as compared to control group. There was 93% improvement in duration of headache in study group as compared to 32% in control group. Mean relief of HI was 95% in meditators, whereas it was only 34% in the control group. The relief in anxiety was also highly significant; 92% in study group compared to control group in which improvement was only 34%. Depression scores also showed improvement up to 87% in meditators compared to control group (38%). A lot of improvement was seen in patients over the period of 8 weeks of Rajyoga meditation (Table-2).

**Table-1: Demographic profile of the patients and duration of headache**

	Total (n=100)	Study Group (n=60)	Control Group (n=40)	<i>p</i>
<b>Age (years)</b>				
Mean±SD	31.43±8.47	30.10±8.22	33.43±8.56	0.054
(Range)	(18–58)	(18–50)	(20–58)	
<b>Male:Female ratio</b>	23:77	10:50	13:27	0.065
<b>Headache Duration</b>				
Mean±SD	2.47±2.03	2.74±1.96	2.05±2.10	0.096
(Range)	(0.5–10)	(0.5–10)	(0.5–10)	
<b>Marital Status</b>				
Single	11	8	3	0.361
Married	89	52	37	

**Table-2: Comparisons of parameters in meditators and non-meditators**

Variable	Meditators		T1 vs T8		Non-Meditators		T1 vs T8	
	T1	T8	Relief (%)	<i>p</i>	T1	T8	Relief (%)	<i>p</i>
Severity	5.92±1.50	0.77±1.17	87	<0.001	6.78±1.39	5.25±2.06	23	<0.001
Frequency	5.73±1.97	0.80±1.07	86	<0.001	5.73±1.96	4.40±2.26	23	<0.001
Duration	8.53±3.73	0.56±0.99	93	<0.001	10.75±2.06	7.30±3.01	32	<0.001
HI	35.83±14.77	1.78±3.40	95	<0.001	42.10±16.50	27.78±17.12	34	<0.001
Anxiety	2.25±0.68	0.18±0.39	92	<0.001	1.80±0.61	1.18±0.45	34	<0.001
Depression	1.40±0.56	0.17±0.38	87	<0.001	1.13±0.56	0.70±0.56	38	<0.001

HI=Headache Index, T1=parameters on Day 1, T8=parameters after 8 weeks

## DISCUSSION

Mind-body medicine focuses on the ways in which health can be affected by various mental, emotional, social, spiritual, and behavioural factors.<sup>5</sup> The brain metabolism can be altered by change in the thought process. This change can be self induced or due to psychotherapy. Headache can be treated by several mind-body therapies. We observed that after the

completion of the course there was a highly significant decrease in the severity of all the factors. Statistically significant reductions were observed in measures of pain, mood disturbance, and psychological symptoms, including anxiety and depression. With meditation practice continued high compliance has been noted in patients as part of their daily lives.<sup>14</sup> We also encountered a higher percentage of relief in anxiety

(92%) as compared to depression (87%). Good improvement has also been reported in tension headache and migraine with yoga.<sup>15</sup> It has been documented that there are more benefits with spiritual meditation as compared to other forms of meditation and relaxation.<sup>16</sup>

In our study patients with medication plus meditation did better than group with medication alone. Similar results were also quoted by Andrasik.<sup>17</sup> Other studies have reported significant decrease in the severity and frequency of chronic headache with the help of relaxation and cognitive behaviour therapies in children and adolescents.<sup>18</sup>

Meditation changes the outlook of the patients towards situations and motivates them to gain liberation from circumstances. This approach is recognised in modern psychology as 'cognitive reappraisal'. Moreover, meditation is said to release endorphins from brain which are natural pain killers.<sup>19</sup> Since Rajyoga meditation is related mainly to mind and one is required to stop only worldly and negative thoughts and concentrate the mind on God, the relief in symptoms of study group were possibly due to effect on supraspinal levels mainly the limbic system. The neural sites involved in sensory images mainly include hippocampus and dorsolateral prefrontal cortex, thalamus, pons, anterior cingulate gyrus, striatum, and cerebellum respectively.<sup>20</sup> Studies have proven that long term meditation tends to lower the pain sensitivity due to increase in the thickness of pain related cortical areas namely anterior cingulate cortex, bilateral parahippocampal gyrus and anterior insula.<sup>21</sup>

Of considerable importance in this study is the statistically significant reduction in the number of subjects reporting headache episodes and associated features from pre-treatment assessment to post-treatment assessment and, improvement was maintained at follow up. The results of this study effectively demonstrate the role of Rajyoga meditation in early and quick relief of CTH and associated co-morbidities if practised regularly, along with the medical treatment. This study also strengthens the efficacy of psychological approaches in the treatment of headache and pain. Meditation has affects on the activity of anterior cingulate cortex which controls emotions and thinking, and the ventromedial prefrontal cortex which controls worrying. Yoga practitioners who practiced cyclic meditation showed a reduction in the latency and an increase in the amplitude of P300 evoked potentials.<sup>22</sup> A change in the middle latency auditory evoked potentials have also been seen in meditators.<sup>23</sup>

Autonomic nervous function becomes optimal due to more cortical inhibition and effective neural modulation at the subcortical level. Meditators not only learn to regulate attention towards pain but also to control specific body sensations. Meditation increases the alpha activity of the brain both in patients of

depression and the normal subjects.<sup>9</sup> Meditation increases serotonin production which is an important neurotransmitter that influences mood and behaviour.<sup>24</sup> Meditation improves attention, acceptance, and awareness and decreases symptoms of anxiety, depression and psychological distress.<sup>25</sup>

## CONCLUSION

Our findings are encouraging and support the use of Rajyoga meditation in the management of CTH where co-morbidities such as anxiety depression and mood disorders, are a major complication for traditional treatments. Further progressive studies be conducted on a larger sample of meditators and non-meditators and long-term follow-up be done for more conclusive statistical power and reliability of effect size estimates, and also for determining a more substantial and long-lasting positive changes in their lives. While meditation is generally helpful and safe, it is not a substitute for medical treatment. We suggest that physicians may consider offering this meditation training as an alternative to suitable headache patients.

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