Effect of yoga on progesterone levels and pain relief in primary dysmenorrhea

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ABSTRACT

Background: The effect of yoga as an alternative therapy for pain relief in primary dysmenorrhoea has drawn considerable attention of researchers of late.

Aim: To study the effect of Yoga on progesterone levels and pain relief in primary dysmenorrhea.

Methods: Sixty student volunteers suffering from primary dysmenorrhea were randomly selected for the study. Assay of pre menstrual progesterone levels was done. They were advised to perform certain Yogic exercises under proper guidance for three months. After 3 months, assay of premenstrual hormone level was done; and NRS scale was administered to evaluate pain relief.

Result: Yoga relieved pain of dysmenorrhea. Premenstrual progesterone levels did not show significant difference before and after Yoga.

Conclusion: It can be concluded that yoga can be safely used as an alternative therapy for pain relief in dysmenorrhea and this action is not mediated through progesterone.

Key words: dysmenorrhea, yoga asanas, progesterone, pain relief

INTRODUCTION

Dysmenorrhea, or painful menstruation is one of the most important causes of school absenteeism amongst adolescent girls, and is also strongly linked to limitations on social, academic, sports and daily activities.[1] Dysmenorrhoea is the most common gynaecologic disorder among female adolescents, with a prevalence of 60% to 93%; and is highly prevalent among female medical students also.[1,2]

The aetiology of primary dysmenorrhoea is not precisely understood, but most symptoms can be explained by the action of uterine prostaglandins, particularly PGF2-alfa.[3] Elevated prostaglandin levels were found in the endometrial fluid of women with dysmenorrhea and correlated well with the degree of pain.[4] The increase in prostaglandins in the endometrium following the fall in progesterone in the late luteal phase results in increased myometrial tone and excessive uterine contraction.[5] The identified risk factors for dysmenorrhoea include teenage, nulliparity, heavy menstrual flow, smoking, upper socioeconomic status; attempts to lose weight, physical inactivity, disruption of social networks, depression and anxiety.[6]

Yoga's potential mental and physical health benefits are reductions in sympathetic nervous system tone, increases in vagal activity and lowering inflammation; all of which could have favourable endocrine and immune consequences.[7] The physical benefits of yoga are linked to the release of β-endorphins and the shift caused in neurotransmitter levels linked to emotions such as dopamine and serotonin. Williams and colleagues reported that Iyengar yoga, tailored to chronic low back pain patients, produced significant reductions in pain, physical disability, and depression.[8] Very few studies suggested that yoga reduced the severity and duration of pain in primary dysmenorrhea.

This study was undertaken to see the effect of yoga on serum progesterone levels in the late luteal phase in those cases who reported complete pain relief after Yoga.

MATERIALS AND METHODS

This study was carried out at a medical college in Vijayawada from January to March 2012 after obtaining the institutional ethical approval. Unmarried girl students, within the age group 18-23 years, with primary dysmenorrhoea were included in our study. Of the 113 students who fulfilled the fixed criteria, sixty subjects who volunteered were allotted to the study group (n=60) for yoga intervention and the remaining (n=53) were included in the control group.

Students already practicing yoga or with secondary dysmenorrhea were excluded from the study. Informed consent were obtained from all the participants, after ensuring strict confidentiality.

A semi-structured proforma consisting the details of the socioeconomic status; detailed history of menstrual flow; menstrual cycle; premenstrual symptoms; menstrual pain; college absenteeism and involvement in daily activities during menstruation was given to all the participants. Numerical rating scale (NRS) consists of a range of numbers from 0 to 10 from which the participant selects the number most representative of her pain. Zero would mean 'no pain' and 10 would mean 'worst possible pain'. The Semi-structured proforma and the NRS were explained and given to both the study and control group to assess the baseline characteristics.

Yoga intervention: The following Yogic Asanas were done by the study group: Navasana, Matsyasana, Dhanurasana, Vajrasana, Paschimotasana, Ustrasana, Ardhamatstyendrasana, Salabhasana, Bhujangasana, Sarvangasana, Uttanapadasana, Padmasana, and Suryanamaskara. The 60 participants in the study group were asked to attend 40 minute yoga class every day for a period of 3 months taught by a Yoga instructor. Meditation was also practiced for 10 min each day. The control group did not receive any Yoga intervention. Each group was evaluated after three months. Semi structured questionnaire and the Numerical rating scale (NRS) were administered on both the groups at the end of three months.

Out of the 60 study group, 30 subjects were selected by simple random sampling for pre and post yoga progesterone assay. Premenstrual serum progesterone was assayed at base line and after 3 months of yoga intervention by immunoflorescence method.

Statistical analysis: Data was entered and analysed using Microsoft Excel and the results were expressed as proportions. Chi square test, and paired 't' test were applied to find out the significance of association; and 'p' value < 0.05 was considered as statistically significant.

RESULTS

In the present study 113 unmarried girl students with primary dysmenorrhoea were recruited and assigned to study group (n = 60) and control group (n = 53). The baseline characteristics were very similar for the study and the control groups.

We found that most of the participants (75%) suffering from dysmenorrhoea belonged to high socioeconomic status. College absenteeism was observed in 98.3% of the study group and 56.9% of the control group. After 3 months of yoga intervention, absenteeism was reported only in 10.3% of the study group, along with improvement in the daily activity involvement. No change was observed in the control group.

Table 1 shows the comparison of NRS scores before and after yoga intervention in the study as well as the control groups. Out of the 60 study group participants, 2 reported with mild pain, 47 reported with moderate pain and 11 reported with severe pain before Yoga sessions. At the end of three months of yoga intervention 53 subjects (88.33%) reported with complete pain relief and 7 subjects reported with mild pain. There was significant ($p<0.0001$) reduction in the pain perceived after yoga intervention. No such shift could be observed in the control group.

Out of the 30 participants who were assayed for serum progesterone level before and after yogic exercises, no statistical significant difference in the hormone levels was detected before (3.86) and after (3.98) yoga intervention.

Table-1. NRS Scores before and after Yoga therapy

NRS	Baseline	After 3 months	P value
Study group			
0	0	53	p<0.0001
1-3	2	7	
4-6	47	0	
7-10	11	0	
Control group			
0	0	1	p>0.05
1-3	1	1	
4-6	43	44	
7-10	9	7	

DISCUSSION

In the present study, we examined the efficacy of yoga in relieving the menstrual pain and stress in unmarried female college students. We found that 98.3% of students in the study group and 56.9% of the control group were crippled by the pain of primary dysmenorrheal as was evidenced by the

degree of absenteeism and other aspects of social functioning. After yogic intervention, the absenteeism came down to 10.3% in the study group which is statistically highly significant. A study on the effect of yoga in dysmenorrhea revealed that there is a significant reduction in the pain intensity and duration in the experimental group compared to the controls; and yoga poses are safe and simple treatment for primary dysmenorrhea.[9] Similar results were also obtained in a study conducted by Sharma et al., in New Delhi.[10]

Yoga works on the whole being of an individual thereby bringing a harmony between the body and mind. The effect of relaxation techniques could be explained partially by nonspecific decreased activation of the brain secondary to decreased input of stimuli from the internal and external environment. The resulting decreased anxiety and depression influences the emotional component of pain.[10] This relaxation is also accomplished by activation of antagonistic muscle groups. Strengthening of weakened muscles and correction of faulty postures is an established pain relieving method.[10] The practice of asana (yogic postures) develops muscle strength and flexibility, which facilitates diaphragmatic breathing.[11] Similarly, relaxation and meditation help with diaphragmatic breathing releases physical and emotional tension. The Asanas invigorate and regulate the working of muscles, viscera, glands, and vascular, nervous, and lymphatic systems.[10,11]

Serum progesterone levels remained low despite pain relief after yoga intervention. Therefore the resultant pain relief in primary dysmenorrheal is not mediated by hormonal control, and is probably by an independent mechanism of yogic exercise and Asanas, which needs to be explored further.

CONCLUSION

It is concluded that yoga can be safely used as an alternative therapy for pain relief in dysmenorrhoea and this action is not mediated through progesterone. Because we are dealing with a functional problem that is not a disease state, we can truly focus on a holistic approach. Further researched are required to explore the detailed mechanism of its efficacy.

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REFERENCES

1. Campbell MA, McGrath PJ. Use of medication by adolescents for the management of menstrual discomfort. *Arch Pediatr Adolesc Med*. 1997;151(9):905-13
2. Alvin PE, Litt IF. Current status of the etiology and management of dysmenorrhea in adolescence. *Pediatrics*. 1982 Oct;70(4):516-25.
3. Coco AS. Primary dysmenorrhea. *Am Fam Physician*. 1999 Aug;60(2):489-96.
4. Pickles VR, Hall WJ, Best FA et al: Prostaglandins in endometrium and menstrual fluid from normal and dysmenorrheic subjects. *J Obstet Gynaecol Br Commonw.* 1965;72:185-92.
5. Dawood MY. In: Overall approach to the management of dysmenorrhea. Williams & Wilkins Dysmenorrhea. 1981:261,
6. Cakir M, Mungan I, Karakas T, Girisken I, Okten A. Menstrual pattern and common menstrual disorders among university students in Turkey. *Pediatr Int.* 2000 :49(6):938-42.
7. Cakir M, Mungan I, Karakas T, Girisken I, Okten A. Menstrual pattern and common menstrual disorders among university students in Turkey. *Pediatr Int*. 2007;49(6):938-42.
8. Williams K, Abildso C, Steinberg L, et al. Evaluation of the effectiveness and efficacy of Iyengar yoga therapy on chronic low back pain. *Spine* (Phila Pa 1976). 2009;34(19):2066-76.
9. Rakhshaee Z. Effect of three yoga poses (cobra, cat and fish poses) in women with primary dysmenorrhea: a randomized clinical trial. *J Pediatr Adolesc Gynecol*. 2011 Aug;24(4):192-6.
10. Sharma A, Taneja DK, Sharma P. Problems related to menstruation and their effect on daily routine of students of a medical college in Delhi, India. *Asia Pac J Public Health*. 2008; 20(3):234-41.
11. Kauts A, Sharma N. Effect of yoga on academic performance in relation to stress. *Int J Yoga.* 2009 Jan;2(1):39-43.