

Contents lists available at BioMedSciDirect Publications

## International Journal of Biological & Medical Research

Journal homepage: [www.biomedscidirect.com](http://www.biomedscidirect.com)



### Original Article

## Effect of exercise on serum LDL levels in premenstrual syndrome

Laskshmi A.N.R ,

Professor&HOD of Physiology, Kakatiya Medical College, Warangal, A.P.

#### ARTICLE INFO

##### Keywords:

Exercise  
Leuteal phase  
PreMenstrualSyndrome  
Serum LDL

#### ABSTRACT

**AIM:**To study the effect of exercise on serum LDL levels during the leuteal phase of menstrual cycle in MBBS First year medical students suffering from Pre- Menstrual Syndrome.**METHOD:** We had included 60 female non-pregnant medical students with regular menstrual cycles for at least 6 months prior to the study by considering the symptoms that occur premenstrually which are recurrent with menses. We divided the medical students into two groups as Control group (n=30) without exercise and Case group (n=30) with exercise for 6 months. The serum LDL levels were analyzed by using auto analyzer in both the groups. **RESULT:** The data was analyzed by using Students t-test with the help of Graph pad software. There was a significant decrease in serum LDL levels in case group when compared to control group with p value < 0.0001. **CONCLUSION:**Regular exercise as a part of life style modification will relieve premenstrual symptoms by altering intravascular enzyme activity resulting in decrease of serum LDL levels.

© Copyright 2010 BioMedSciDirect Publications IJBMR -ISSN: 0976:6685. All rights reserved.

### 1. Introduction

Pre Menstrual Syndrome is a condition occurring in the luteal phase of the menstrual cycle prior to the onset of a woman's menstrual period. 97% of women experience some physical symptoms and mood changes premenstrually, about 50% experience minor changes premenstrually while 35% experience symptoms and mood changes that disrupt work, social and family life. 5-10% experience severely debilitating symptoms that cause major disruptions to their lives.

The diagnostic definition for PMS by American Congress of Obstetricians and Gynaecologists (ACOG) states that symptoms must be present in the 5 days before a woman's period for at least 3 menstrual cycles in a row and end within 4 days after her period starts.

The prevalence of symptoms was higher in obese women and exercise has been recommended as a method of reducing PMS occurrence and severity. Regular exercise as a part of life style modification relieves premenstrual symptoms and reduces obesity.

As regular exercise is a part of lifestyle modification will relieve premenstrual symptoms and improve lipid profile. Regular exercise has shown to lower blood triglycerides in individuals with initially high levels with no influence in persons with normal concentrations.

### 2. Materials and Methods:

60 female non-pregnant medical students of Kakatiya Medical College, Warangal were selected with regular menstrual cycles for at least 6 months prior to the study with the symptoms that occur premenstrually and recurrent with menses with self reported mild, moderate, severe level and not due to other physical or mental disorders. They were divided into 2 groups as Control group without exercise (n=30) and Case group with exercise (n=30). The exercise pattern consisted of a 5 minutes warm up, followed by a 30 minutes limb and trunk fast exercise and a 10 minutes cool down. The total exercise duration was for 45 minutes, 3 times a week for 6 months.

After explaining the purpose, procedure and confidentiality written informed consent was taken. 5 ml fasting sample of blood was taken from each subject and serum samples were analyzed for LDL - Cholesterol estimation using Roche/ Hitachi auto analyzer.

A modified Premenstrual Distress Questionnaire was given to all the subjects and the symptoms were evaluated by

\* Corresponding Author : Dr. Laskshmi A.N.R ,  
Professor&HOD of Physiology  
Kakatiya Medical College  
Warangal, A.P.  
PIN-506007  
e-mail address: lakshmiar@gmail.com

considering psychological, behavioural, physical, autonomic, neurovegetative symptoms, electrolytic and skin changes. The data was analysed by students' t-test with the help of Graph pad Software calculator between Control group and Case group and  $p < 0.05$  was considered as statistically significant.

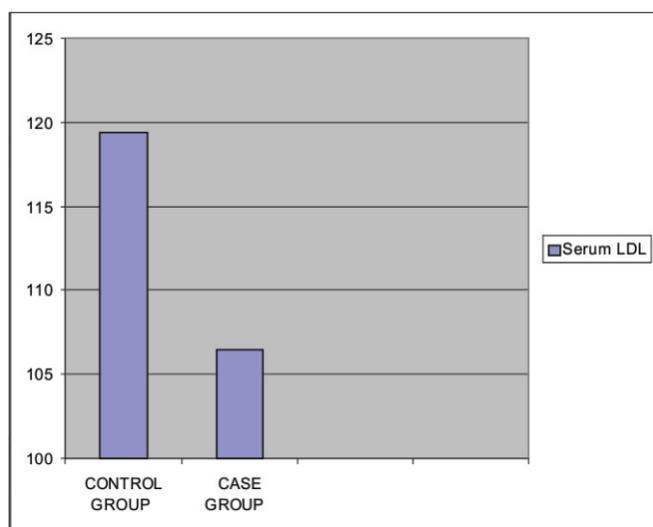
### 3. Results:

#### Comparison of serum ldl levels in control group and case group:

Parameter	Control group	Case group
Serum LDL (Mean $\pm$ SD)	119.35 $\pm$ 28.15	106.54 $\pm$ 28.15

Decrease in Serum LDL levels were significant with  $p < 0.0001$  in Case group when compared to Control group.

#### GRAPH:



### 4. Discussion:

PMS is a major clinical entity affecting large segment of female population. The underlying mechanism of PMS is multi-factorial and might affect diverse neuropsychophysiological systems, remains unclear and speculative.

Exercise may improve maintenance of weight loss achieved through energy restriction. Physical activity improves general health and helps to relieve nervous tension and anxiety. That too exercise is believed to release endorphins which are chemical messengers for nerves that affect mood, perception of pain, memory retention and learning. Endorphins functioning may be dependent on maximum fluctuation in hormones occurring during the premenstrual phase.

Regular exercise alters the intravascular enzyme activity by decreasing the serum LDL cholesterol levels which is beneficial to the body.

### 5. Conclusion:

Regular exercise may decrease the level of adipose tissue leading to decrease in estrogen and progesterone levels which may be an affective factor in improvement of emotional symptoms. Exercise may relieve PMS symptoms by impacting circulating hormone levels acting on the Hypothalamic- Pituitary -Adrenal axis.

The decrease in serum LDL levels in Case group suggests that regular exercise produces favorable changes to relieve PMS symptoms.

### 6. References:

- [1] Aganoff JA, Boyle GJ. Aerobic exercise, mood states and menstrual cycle symptoms. *J. Psychosom. Res.* 1994; 38 (3): 183-192.
- [2] Choi PY, Salmon P. Symptom changes across the menstrual cycle in competitive sports women. Exercisers and sedentary women. *Br. J. Clin. Psychol.* 1995; 34: 447-460.
- [3] Daley A. Exercise and premenstrual symptomatology: a comprehensive review. *J. Womens Health.* 2009; 18 (6): 895-899.
- [4] Gannon L. The potential role of exercise in the alleviation of menstrual disorders and menopausal symptoms: a theoretical synthesis of recent research. *Women Health* 1988; 14 (2): 105-127.
- [5] Halbreich U, Backstrom et al., Clinical diagnostic criteria for premenstrual syndrome and guidelines for their quantification for research studies. *Endocrinol.* 2007; 23 (3) : 123-130.
- [6] Kelley GA, Kelley KS, Tran ZV. Aerobic exercise and lipids and lipoproteins in women: a meta-analysis of randomized controlled trials. *J. Womens Health* 2004; 13: 1148-1164.
- [7] Leon A, Sanchez OA. Response of blood lipids to exercise training alone or combined with dietary intervention. *Med. Sci. Sports Exer.* 2001; 33: 502-515.
- [8] Masho SW, Adera T, S outh-Paul J. Obesity as a risk factor for premenstrual syndrome. *J. Psychosom. Obstet. Gynaecol.* 2005; 26 (1): 33-39.
- [9] Mortola JF. Assessment and management of premenstrual syndrome. *Curr. Opin. Obstet. Gynecol.* 1992; 4 (6): 877-885.
- [10] Palinski W, Rosenfeld M, Yla-Herttuala S. Low density lipoprotein undergoes oxidative modification in vivo. *Proc Natl Acad Sci USA* 1989; 86: 1372-6.
- [11] Prior JC, Vigna Y. Conditioning exercise and premenstrual symptoms. *J. Reprod. Med.* 1987; 32 (6): 423-428.
- [12] Prior JC, Vigna Y, Alojada N. Conditioning exercise decreases premenstrual symptoms. A prospective controlled three month trial. *Eur. J. Appl. Physiol. Occup. Physiol.* 1986; 55 (4): 349-35
- [13] Prior JC, Vigna Y, Sciarretta D, Alojado N, Schulzer M. A prospective, controlled 6 month trial. *Fertil. Steril.* 1987; 47 (3): 402-408.
- [14] Schmidt PJ, Nieman LK, Danaceau MA, Adams LF, Rubinow D R. Differential Behavioural effects of gonadal steroids in women with and in those without Premenstrual Syndrome. *The New England Journal of Medicine*, 1998; 338: 209-216.
- [15] Stoddard JL, Dent CW, Shames L, Bernstein L. Exercise training effects on premenstrual distress and ovarian steroid hormones. *Eur. J. Appl. Physiol.* 2007; 99 (1): 27-37.
- [16] Timonen S, Procope BJ. P remenstrual syndrome and physical exercise. *Acta Obstet. Gynecol. Scand.* 1971; 50 (4): 349-355.
- [17] Witztum JL, Steinberg D. Role of oxidized low density lipoprotein atherogenesis. *J Clin Invest* 1991; 88: 1785-92.
- [18] Wyatt K, Dimmock PW, O'Brien PM. Premenstrua syndrome. In: Barton S, ed. *Clinical evidence*. 4 th issue. London: BMJ Publishing Group 2000: 1121-33.