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Evaluation of the effect of omega-3 fatty acids in the treatment of premenstrual syndrome: ‘A pilot trial’

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KEYWORDS

Omega-3 fatty acids;
Premenstrual
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PMS;
Psychiatric
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Summary

Introduction: Premenstrual syndrome (PMS) refers to a cyclic appearance of somatic and psychiatric symptoms that affect some women. Finding an effective and safe method for the treatment of PMS has always been a serious concern, because approximately 40% of women report PMS, and in 2–10% of cases it is severe enough to affect their life style and job.

Objective: The purpose of the present study is to evaluate the effect of omega-3 fatty acids on the treatment of PMS.

Method: A randomized double blind controlled trial was performed on 184 eligible women. The eligible women were randomly assigned into two groups. The number of women who have finalized the study with us was 124.

In the case group (omega-3 group = group A, $n = 70$), omega-3 in an amount of 2 g was prescribed for a one per day basis on a single dosage (two 1 g pearls), and in the control group (placebo group = group B, $n = 69$) 2 placebo soft gel, which were completely similar to omega-3 soft gels, were prescribed.

The severity and duration of each of the symptoms were compared in both groups 1.5 and 3 months after the beginning of treatment.

Results: There were no significant differences between the two groups according to age, BMI, level of education, and the severity and duration of primary symptoms.

After 45 days from starting omega-3, the mean severity of depression ($P = 0.03$), anxiety ($P = 0.02$), lack of concentration ($P = 0.03$) and bloating ($P = 0.02$) in the case group, were all significantly lower than in the control group.

The duration of depression ($P = 0.04$) and bloating ($P = 0.031$) in the case group were less than in the control group.

After 90 days from starting the treatment, the mean severity of depression ($P = 0.007$), anxiety ($P = 0.004$), lack of concentration ($P = 0.009$), bloating ($P = 0.004$), nervousness ($P = 0.01$) and the duration of depression ($P = 0.01$), nervousness ($P = 0.02$), anxiety ($P = 0.03$), lack of concentration ($P = 0.02$), bloating ($P = 0.004$), headache ($P = 0.04$) and breast tenderness ($P = 0.02$) were all lower in the case group.

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Conclusion: It appears that omega-3 fatty acids may reduce the psychiatric symptoms of PMS including depression, nervousness, anxiety, and lack of concentration and may also reduce the somatic symptoms of PMS including bloating, headache and breast tenderness. These effects increased by longer duration of treatment.

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Introduction

Premenstrual syndrome (PMS) is defined as the cyclic occurrence of mood and/or behavioural changes, which start during the secretory or premenstrual phase of the menstrual cycle and recover at the beginning of menstruation.¹

Approximately 40% of women report PMS, but in 2–10% of cases it is severe enough to affect their lifestyle and work.^{1,2}

From the first expression of this disorder in 1931 till the present day, because of the real unknown causes,¹ different and varied treatments have been suggested, these based on aetiological hypotheses including low progesterone levels, high oestrogen levels, falling oestrogen levels, changes in the oestrogen/progesterone ratio, increased aldosterone activity, increased rennin–angiotensin activity, increased adrenal activity, endogenous opiate withdrawal, subclinical hypoglycaemia, central changes in catecholamines, responsiveness to prostaglandins, vitamin deficiencies and excess prolactin secretion.¹

The main purpose of treatment is to control the symptoms enough to free the women of tension and pain and to be able to work appropriately throughout the entire menstrual cycle.¹

Amongst the most important of these drugs are hormonal agents such as oral contraceptive pills, danazol, GnRH agonists, anti-progesterone RU 486, and anti-anxiety agents, tri-cyclic antidepressants, selective serotonin reuptake inhibitors (SSRIs), diuretics, prostaglandin inhibitors, dietary supplementations and vitamin B₆.^{1,3,4} Because the women may need treatment in the long term, a drug that is both safe and inexpensive should be used.¹

Omega-3 fatty acids are one of the agents that have been proposed for the relief of symptoms of PMS.

There are two main forms of omega-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).⁵ Omega-3 fatty acids may act as anti-inflammatory agents and reduce the conversion of arachidonic acid to prostaglandin F₂ α (PGF₂(α)) and therefore, increase the level of prostaglandin I₂ (PGI₂) which has less inflammatory action.^{5,6}

Omega-3 fatty acids are among essential dietary agents. Their level in most ordinary food of the American people is very low.⁶ They can be increased in the food by changing diet, and by adding them as a supplement.

In some studies,⁵ omega-3 fatty acids have been found to be effective in different cases of psychiatric disorders. A study on EPA could not show any effect on PMS⁷ however; some other studies evaluated the effect of omega-3 fatty acids through fish oil for the treatment of mild cases of depression.⁸ Therefore, it may be an acceptable method of treatment for PMS as one of its symptoms is mood depression.⁹

The adverse effects are rare but they sometimes may cause nausea, diarrhoea and belching with a bad taste in the mouth.⁶

Unfortunately, there are not many studies on the effect of omega 3 fatty acids on PMS, and to the best of our knowledge, this is the first study on this subject.

The purpose of the present study is to evaluate the effect of omega-3 fatty acids for the relief of the symptoms of PMS. Because the placebo effect is also very important in the management of patients, this study has been performed in comparison with placebo.

Materials and methods

A randomized, double-blind clinical trial was performed in Tehran, Iran, between October 2009 and March 2010 on university students who suffered from PMS. It was performed as an exploratory pilot trial.

Inclusion criteria were: age between 20 and 45 years, educational level more than high-school, normal menstrual cycle and bleeding during previous 3 months (3–7 days of bleeding), body mass index (BMI) between 19 and 26, regular menses and having PMS, according to a questionnaire and recording the symptoms for 3 consecutive cycles.

Exclusion criteria were: breast feeding and pregnancy, any history of psychiatric disorders or drug use, smoking or alcohol consumption, any systemic disorder, oral contraceptive pill usage, allergy for sea foods and coagulopathy, using dietary or other supplementation, special impressive events, such as marriage, family bereavement, surgical operations 3 months before entering the study, primary or secondary amenorrhoea and immigrants (because all of these may have effect on women and cause the symptoms such as PMS).

The study was performed as an exploratory pilot trial. The objective of the study was to evaluate the effectiveness of omega 3 for the management of PMS and to compare the effectiveness of omega 3 for the management of PMS with that of placebo.

The diagnosis of PMS was confirmed in an interview, and after selection of the cases a diagnostic questionnaire, based on diagnostic criteria of The American College of Obstetrics and Gynaecology, was fulfilled for 3 consecutive months before entering the study. The women should have one or more somatic or mood symptoms for 5 days before beginning of menstruation, in her three previous cycles, which cease at the onset of menstruation.

Mood symptoms include depression, nervousness, jitteriness, anxiety, dizziness and low concentration and being incapable of social activity. Somatic symptoms included breast tenderness, bloating, headache and oedema.

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