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Short Article

The role of omega-3 fatty acids in alleviating symptoms of dysmenorrhea

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Abstract

Introduction: The study will focus on presenting the effects of adequate intake or supplementation of omega-3 fatty acids on patients' perception of menstrual pain. Other known characteristics of these substances will also be presented.

Aim of the study: The aim of the study was to demonstrate impact of omega-3 fatty acids supplementation or normal supply to dysmenorrhea among women through a literature review.

State of Knowledge: Dysmenorrhea is a condition that limits normal functioning and affects up to 90% of women. Therefore, it is so important to study its pathogenesis and prevent its occurrence. It results in the use of painkillers and the absence of many women from daily activities. Omega-3 acids are polyunsaturated fatty acids that have a positive effect on numerous organs and functions of the human body. They are substances with anti-inflammatory properties, which have been used in research on the influence of omega-3 acids on reducing dysmenorrhea among women.

Conclusion: Omega-3 acids reduce dysmenorrhea in women. It is very important to pay attention to the presence of acids in diet as well as supplementation among patients.

Key worlds: omega-3 fatty acids, polyunsaturated fatty acids, dysmenorrhea, supplementation, diet

Introduction

Fats constitute the basis of a healthy and balanced diet. They provide ADEK vitamins and are a source of energy. The basic fats that should make up the body's needs for this macronutrient are polyunsaturated fatty acids (containing double bonds), i.e. omega-3 and omega-6 acids.

Omega-3 fatty acids are primarily α-linolenic acid (ALA-precursor for other omega-3 polyunsaturated fatty acids), eicosapentaenoic acid (EPA-forming, inter alia, in the cell membrane of smooth muscle cells), docosahexaenoic acid (DHA-forming, inter alia, in the cell membrane of nerve cells).

They are mainly found in oily marine fish and plant-based products such as flaxseed oil, walnuts, flaxseed, macadamia nut oil, almonds, soya, broccoli, cabbage and many others [1] [2]. Table 1 presents the content of omega-3 fatty acids in examples of omega-3-rich products [3].

Table 1. Omega-3 fatty acid content of select foods[a,b]			
Food item	**EPA**	**DHA**	**ALA**
Catfish	Trace	0.2	0.1
Cod	Trace	0.1	Trace
Mackerel	0.9	1.4	0.2
Farmed Salmon	0.6	1.3	Trace
Wild Salmon	0.3	1.1	0.3
Canned Salmon	0.9	0.8	Trace
Salmon, Chinook	1.0	0.9	Trace
Swordfish	0.1	0.5	0.2
Tuna, bluefin	0.3	0.9	-
Canned in oil Tuna light	Trace	0.1	Trace
Canned in water Tuna light	Trace	0.2	Trace
Canned in oil Tuna white	Trace	0.2	0.2
Canned in water Tuna white	0.2	0.6	Trace
Lobster	-	-	-
Mussels	0.2	0.3	Trace
Shrimp	0.3	0.2	Trace
Butternuts	-	-	8.7
Flaxseed	-	-	18.1
Walnuts	-	-	9.1
Canola	-	-	9.3
Flaxseed	-	-	53.3

aMeasurements are in grams per 100 g (3.5 oz) of food item
bTrace = G0.1;- 0 or no data
ALA a-linolenic acid; *DHA* docosahexaenoic acid; *EPA* eicosapentaenoic acid
(Adapted from US Department of Health and Human Services)

Source: Defilippis, Andrew & Blaha, Michael & Jacobson, Terry. (**2010**). Omega-3 Fatty Acids for Cardiovascular Disease Prevention. Current treatment options in cardiovascular medicine

In Poland, fish consumption is low [4], so it is important to emphasise patient education in the context of dietary knowledge about other sources of omega fatty acids and possible supplementation.

Omega fatty acids have documented anti-inflammatory effects (among other things, they affect cell membrane permeability by signalling a pattern of inflammatory mediator production) [5].

Methodology:

A variety of scientific papers found using the Pubmed platform and Google Scholar were analysed. The most key information contained in the articles was highlighted and presented in the study in a structured manner, giving a broad overview of the effects of omega-3 fatty acid supply on menstrual pain as well as other related information.

State of knowledge

Known effects of omega-3 fatty acids

Omega-3 fatty acids have a significant impact on health and quality of life. A correlation between omega-3 fatty acid supplementation and the occurrence of cardiovascular events (sudden arrhythmia mortality) has been confirmed [6] [7]. Additionally, they have been shown to have an effect on lowering triglycerides in patients with hypertriglyceridaemia [8] [9]. There is also increasing information about the potential positive effects of supplementation in patients with rheumatoid arthritis or hypertension. [8] There are also reports on the association of omega-3 fatty acid deficiencies with neuro-psychiatric diseases such as Alzheimer's disease, schizophrenia, depression or hyperactivity. [10] [11]. In addition, it has been suggested that omega-3 fatty acids may contribute to improving the efficacy of chemotherapy among cancer patients. [12] Consuming adequate doses of omega-3 fatty acids is also extremely important during pregnancy: they are essential building elements for the brain and retina of the foetus and may also play a role during pregnancy and in the prevention of perinatal depression. [13] Other

proven effects include strengthening the hydrolipidic barrier of the skin, strengthening hair and nails.

Recommended doses

It is currently recommended that people with known cardiovascular disease should consume a minimum of 1g/d of omega-3 fatty acids, while healthy patients should consume at least 250-500mg/d. Both docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) should be provided. Patients with hypertriglyceridaemia require higher doses of 3-4g/d.

Omega-3 fatty acids and painful menstruation

Painful menstruation (dysmenorrhea) is a condition that limits normal functioning and often requires the use of painkillers. Some data indicate that it affects up to 90% of women [14]. It usually lasts 1-3 days and results from the accumulation of pro-inflammatory prostaglandins, mainly PGF2a and PGE2, in the pelvic muscles [15]. Menstrual pain can be alleviated with oral analgesics and anti-inflammatory drugs, e.g. from the NSAID group, which, if used chronically, can contribute to deterioration in the function of the glomerular filtration of the kidneys [16] or damage to the gastrointestinal mucosa [17]. Efforts should therefore be made to minimise the supply of such preparations by women experiencing menstrual pain. Other methods used in medicine to reduce menstrual pain include oral contraception, danazol, hysterectomy, acupuncture and others. In addition, painful menstruation is the most common cause of short-term absence from school for young girls, which only points even more strongly to the scale of the problem and the need to develop ways of medical assistance in this context [18].

In independent clinical studies, the authors confirmed the association of omega-3 fatty acid supplementation with a reduction in the use of pain medication among female patients under observation or the perception of a reduction in pain as a result of supplementation.

The study (Sadeghi et al, 2018) divided a group of 100 women between 18 and 25 years of age into four groups: those taking omega-3 fatty acids (180mg EPA and 120mg DHA/d), those taking vitamin E (200IU/d), those taking both omega-3 fatty acids and vitamin E, and a placebo group. Tablets were taken for 5 days (2 days before and 3 days after the start of menstruation) for a period of 8 weeks. A reduction in menstrual pain was seen in all 3 of the first intervention groups while the effect was strongest in the group taking both omega-3 acids and vitamin E [19].

In a study (Mehrpooya et al, 2017), a group of 80 women between 18 and 45 years of age was divided into 2 groups: the first received 400 mg of ibuprofen and 1000mg of omega-3 acids, the second group received 400mg of ibuprofen and 1000mg of calcium. The substances were administered daily for the first month and then 8 days before and 2 days after the start of the cycle in the second and third month. Statistically significant results were shown: after 2 and 3 months of the study, the first group receiving omega-3 fatty acids required less ibuprofen than the calcium supplement group [20].

In a study (Widyatmoko et al, 2023), 126 women experiencing menstrual pain were included and 22 patients with an adequate daily intake of omega-3 fatty acids (≥ 1.1 g/day) (recommended dietary allowance (RDA)) were selected from this group. It was shown that the group with an adequate supply of omega-3 fatty acids was more likely to experience mildly severe pain and less likely to experience very severe pain [21].

A study (Kooshki et al, 2021) divided a group of 50 women between 18 and 22 years of age into 2 groups: the first received omega-3 fatty acids (180 mg EPA and 120 mg DHA), the second 400 mg ibuprofen every 8 hours for 3 days (the day before and 2 days after the start of menstruation). A similar analgesic effect was shown in the 2 groups for all 3 days of intake [22].

It has also been shown that the most effective way to reduce the risk of painful menstruation is supplementation and an adequate supply with food of omega-3 fatty acids [23]. It is also worth mentioning that the studies on the effect of omega-3 fatty acids on chronic pain concerned not only menstrual pain, while according to the meta-analysis [24], the highest statistical significance was obtained precisely in the case of menstrual pain.

Conclusions

According to a number of independent studies, omega-3 fatty acids have a significant effect on the experience of menstrual pain, which limits patients' daily functioning, contributes to girls' absence from school and results in the regular intake of analgesics with a long list of side effects. Painful menstruation is also a problem among female athletes, which can affect their worse results. This should therefore be kept in mind in daily clinical practice, educating patients experiencing such pains about a diet rich in omega-3 fatty acids or additional supplementation. Other proven benefits of omega-3 fatty acids such as cardioprotective, blood triglyceride-lowering and anti-inflammatory effects should also not be forgotten and, in any case, patients should be made aware of the dietary recommendations in force at the time.

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