Aerobic Exercise and Omega 3 Supplementation to Reduce Primary Dysmenorrhea (Literature Review)

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Abstract

Background: Primary dysmenorrhea is menstrual pain that is felt in the absence of organic disease. Hypersecretion of prostaglandins, especially PGF2*a* and PGE2 and increased uterine contractility are the main causes of primary dysmenorrhea during menstruation in women. Omega 3 can reduce menstrual pain by reducing levels of prostaglandins during menstruation. besides aerobic exercise can be done as one way to reduce the severity of primary dysmenorrhea.

Methods: This study used a literature review method using comprehensive strategies such as searching for articles in research journal databases, searching through the internet, reviewing articles. The data database search used was Proquest, Pubmed, sciencediretct.com, Elsevier journal. The inclusion criteria in this study are British journals that discuss physiology, omega 3, aerobic exercise, and primary dysmenorrhea. The exclusion criteria in this study were international journals that had been published over the last 5 years in 2021.

Result: Based on a review of research results, it is clear that regular aerobic exercise can significantly reduce primary dysmenorrhea due to increased progesterone. Omega 3 supplementation can significantly reduce primary dysmenorrhea because it can inhibit prostaglandin production

Conclusion: Aerobic exercise and omega 3 supplementation can reduce primary dysmenorrhea during menstruation

Keyword: *Omega 3, Aerobic exercise, primary dysmenorrhea*

Introduction

Hypersecretion of prostaglandins, especially prostaglandin F2 alpha (PGF2*a)* and prostaglandin (PGF2), and increased uterine contractility will cause primary dysmenorrhea during menstruation for women [1]. Primary dysmenorrhea is menstrual pain that is felt in the absence of organic disease[2]. In general, women who experience primary dysmenorrhea will experience peak pain during 2 menstrual days [3]. The secretion of prostaglandin levels is controlled by progesterone. When progesterone levels decrease before menstruation, it causes progesterone to increase due to negative feedback[4].

Primary dysmenorrhea in the world has an incidence rate of 45% to 93% in fertile women and the highest incidence rate occurs in adolescence[3]. So far, women who experience primary dysmenorrhea use non-steroidal anti-inflammatory drugs in the management of menstrual pain which will have an impact on health[5].

Another alternative needs to be sought to overcome this problem, one way of minimizing primary dysmenorrhea is by consuming one of the natural products derived from fish oil, namely Omega 3. Omega 3, namely unsaturated fatty acids (Polyunsaturated Fatty

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Acids) which consists of several double bonds[6]. Omega 3 is famous for its anti-inflammatory properties[7]. The content contained in omega 3 is α-linolenic acid, (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) [8]. Omega 3 can reduce menstrual pain by reducing levels of prostaglandins during menstruation[9]. In addition, aerobic exercise can be done as a way to reduce the severity of primary dysmenorrhea[10].

This study aims to determine the effect of omega 3 supplementation and aerobic exercise on primary dysmenorrhea. The results of this study are expected to be a reference for how to deal with primary dysmenorrhea when women are menstruating.

Methods and Materials

This study used a literature review method using comprehensive strategies such as searching for articles in research journal databases, searching through the internet, reviewing articles. The data database search used was Proquest, Pubmed, sciencediretct.com, Elsevier journal. The inclusion criteria in this study are British journals that discuss physiology, omega 3, aerobic exercise, and primary dysmenorrhea. The exclusion criteria in this study were international journals that had been published over the last 5 years in 2021. The keywords used in the search were omega 3, aerobic exercise, and primary dysmenorrhea. There were 21 articles obtained and 12 articles analyzed through objective analysis, topic suitability, sample size, research protocol and the results of each article.

Result

The results of the research used in this literature review are as follows:

Aerobic Exercise Reduces Primary Dysmenorrhea

In the study (Dehnavi, Jafarnejad and kamali, 2018)[10] 70 female students who experienced primary dysmenorrhea at the Mashhad University Medical Science dormitory were divided into two groups, namely the treatment group and the control group. The treatment was carried out for eight weeks, three times a week and the duration of exercise was 30 minutes, the treatment given was aerobic exercise, the results in this study showed that aerobic exercise performed in the fourth week did not decrease significantly in both groups, but at the eighth week there was a decrease. which is significant in the intervention group than in the control group. It is proven that aerobic exercise can reduce primary dysmenorrhea.

In the study (Fernandez Martinez et al., 2019)[11] 305 female students with an average of 20 years completed a self-report survey on primary dysmenorrhea and lifestyle, the results showed that in total 76% of the sample experienced primary dysmenorrhea, students who did not experience primary dysmenorrhea were those who regularly doing aerobic exercise such as jogging and pilates.

Then in a study (Parven et al., 2020)[12] 302 women aged 18 to 30 years with complaints of primary dysmenorrhea participated in a cross-sectional study method, the results in this study reported that regular aerobic exercise with moderate intensity can reduce and prevent primary dysmenorrhea.

In the study (Kim, 2019)[13] 250 women with primary dysmenorrhea were included in a meta-analysis to compare the effects of a yoga exercise program and not doing yoga on the intensity of menstrual pain. In this study, the results showed that the intervention in the yoga group significantly reduced pain in women with primary dysmenorrhea.

In the study (Akbas and Erdem, 2019)[14] 37 women aged 18 to 25 who experienced primary dysmenorrhea were divided into two groups, namely the aerobic exercise group and the control group. The treatments were carried out three times a week for four weeks. In this study, it was found that aerobic exercise for four weeks was effective in reducing primary dysmenorrhea during menstruation.

In the study (P and P, 2016)[15] 100 research subjects aged 16 to 26 years were divided into two groups, namely the aerobic exercise group and the stretching exercise group. The intervention was carried out three times a week for 12 weeks with a duration of 40 minutes of exercise. The results in this study that aerobic exercise and stretching exercises can significantly reduce primary dysmenorrhea. This study also explains that there is no

significant difference between aerobic exercise and stretching exercise against primary dysmenorrhea.

In the study (Kannan et al., 2019)[1] 70 women who experienced primary dysmenorrhea were divided into two groups, namely the treatment group and the control group. The treatment group did the exercises three times a week for seven months. The control group continued treatment only. The protocol used is treadmill exercise. The results in this study reported that four weeks of aerobic exercise can significantly reduce pain intensity in women with primary dimenorrhea.

Omega 3 Supplementation Reduces Primary Dysmenorrhea

In a study (Mehrpooya et al, 2017)[16] 80 primary dysmenorrhea women aged 18 to 45 years were divided into two groups (omega 3 and calcium) for 3 months. Interventions were given every day in the first menstrual cycle and eight days before to two days after menstruation for the second and third cycles. In this study, Omega 3 was given at a dose of 1000 mg and calcium at a dose of 1000 mg. The results in this study found that Omega 3 is more effective in reducing primary dysmenorrhea than calcium.

In the study (Sadeghi et al, 2018)[17] 100 women who experienced complaints of primary dysmenorrhea aged 18 to 25 years were divided into 4 groups, namely the omega 4 group, the vitamin E group, the omega 3 group, vitamin E, and the placebo group for 8 weeks given every day . Omega 3 is given in doses (180 mg EPA and 120 mg DHA). The results in this study indicate that the combination of omega 3 with vitamin E given in the first five days of menstruation can significantly reduce the intensity of pain due to primary dysmenorrhea.

In the study (Davaneghi et al, 2017)[18] 120 female students with complaints of primary dysmenorrhea were divided into two groups, namely the group with the omega 3 supplementation intervention and the group using a placebo for two months. Omega 3 is given in doses (180 EPA and 120 DHA). The results obtained in this study are that omega 3 supplementation can reduce pain intensity and can reduce the duration of bleeding in women who experience primary dysmenorrhea.

In the study (Quist et al, 2016)[19] 12 female patients with atopic dermatic received the intervention of omega 3 supplementation twice a day for five consecutive days. The results in this study found that there was a significant decrease in the provision of omega 3 to prostaglandin F2-alpha (PGF2α).

In the study (Djuric et al., 2017)[20] 47 normal people aged 25 to 75 years with a BMI between 18 and 40 kg / mg2 were given low doses of omega 3 and high doses of omega 3. omega 3 is given every day for 2 weeks. the doses given were low dose omega 3 (280 mg / day) and high dose omega 3 (880 mg / day). The results showed in this study that omega 3 can reduce prostaglandin E2 (PGE2). The reduction in PGE2 was significantly attenuated by being overweight.

Discussion

Aerobic Exercise Reduces Primary Dysmenorrhea

Primary dysmenorrhea is menstrual pain that is felt in the absence of other diseases[2]. Primary dysmenorrhea is caused by hypersecretion of prostaglandins especially PGF2a and PGE2 and an increase in uterine contractility[1]. Uterine contractility peaks within the first two days of menstruation. Progesterone controlled prostaglandin production. Before menstruation, the progesterone level will decrease so that it will trigger an increase in prostaglandin production which causes primary dysmenorrhea[3].

Several methods to reduce primary dysmenorrhea complaints are doing aerobic exercise regularly, in research (Dehnavi, Jafarnejad and kamali, 2018)[10] explained that aerobic exercise which is done three times a week with a duration of 30 minutes regularly can reduce the intensity of pain in women who experience primary dysmenorrhea. Then in research (Fernandez Martinez et al., 2019)[11] explained that women who do not experience primary dysmenorrhea are those who routinely do aerobic exercises such as jogging and pilates. Then in research (Kim, 2019)[13] explained that aerobic exercises such as yoga have been shown to reduce pain intensity. Other research is corroborated by research (P and P, 2016)[15] and (Kannan et al, 2019)[1] explained that aerobic exercise such as a treatmill can significantly reduce primary

dysmenorrhea during menstruation. Apart from that in research (P and P, 2016)[15] make a comparison between aerobic exercise with stretching exercises explained that there is no significant difference between the two exercises, aerobic exercise and stretching exercises can significantly reduce primary dysmenorrhea.

Aerobic exercise can increase progesterone levels [4]. Research has found that the inverse relationship between progesterone and prostaglandins, when progesterone decreases the production of prostaglandins will increase. Primary dysmenorrhea will occur due to prostaglandin hypersecretion[1], by doing aerobic exercise regularly can reduce prostaglandin secretion due to an increase in progesterone so that it can reduce pain intensity for women who experience primary dysmenorrhea.

Omega 3 Supplementation Reduces Primary Dysmenorrhea

Another method to reduce complaints of primary dysmenorrhea is by using omega 3 supplementation.The content contained in omega 3 is α-linolenic acid, (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) [8]. Omega 3 can reduce pain by reducing levels of prostaglandins during menstruation[9].

on research (Mehrpooya et al, 2017) [16] explains that omega 3 supplementation for three months and three months at a dose of 1000 mg is effective in reducing primary dysmenorrhea. Then research (Sadeghi et al, 2018) [17] explained that the combination of omega 3 supplementation and calcium can significantly reduce primary dysmenorrhea during menstruation. Other research is corroborated by research (Sadeghi et al, 2018). [17] and (Davaneghi et al, 2017) [18] explain that omega 3 with a dose (180 EPA and 120 DHA) for 2 months can reduce the intensity of hair pain in women with primary dysmenorrhea. Apart from that research (Quist et al, 2016) [19] explained that providing omega 3 supplementation can significantly reduce levels of PGF2α. Then in research (Djuric et al., 2017) [20] explains that omega 3 supplementation can reduce PGE2. This can be attributed to women who experience dysmenorrhea, dysmenorrhea is caused by increased levels of prostaglandins, based on research that has been shown that omega 3 supplementation can reduce levels of PGF2α and PGE2 so that it can potentially reduce pain intensity due to primary dysmenorrhea.

Conclusion

Aerobic exercises such as gymnastics, yoga, pilates, jogging and a treadmill which is done regularly three times a week can increase progesterone production. The three progesterone increases, the production of prostaglandins will decrease so that it has the potential to reduce primary dysmenorrhea during menstruation.

Supplementation with doses of omega 3 (180 mg EPA and 120 mg DHA) can help reduce complaints of primary dysmenorrhea by inhibiting the production of prostaglandins.

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