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Effect of aerobic exercise on pain and quality of life in women with primary dysmenorrhea

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Abstract
Introduction: Primary dysmenorrhea is a pain full menstruation without any pelvic pathology, and that's the most common health problem among women of reproductive age. Primary dysmenorrhea described as painful cramps during menstruation that leads absenteeism and affect the QOL, its associated with restriction of activity and absence from routine activity. The objectives are to find out effectiveness of aerobic exercise on reducing pain and improving of quality of life in women with primary dysmenorrhea, and if there is possibility then what can be the adequate duration of aerobic training to be effective.
Purpose of Study: The aim of the study to find out effect of Aerobic Exercise on pain and QOL in women with primary dysmenorrhea.
Methodology: Article from different search engines like PubMed, Research Gate, Google Scholar are being reviewed. Articles from previous 5 years, those which are available in full text and published in English language are included.
Result: Article showed positive effect of aerobic exercise in reducing pain which was assessed through Premenstrual syndrome scale, visual analogue scale, short form McGill pain questionnaire, numerical pain rating scale, and QOL also improved which was also assessed through QOL- 12 item short form health survey, quality of life enjoyment & satisfaction questionnaire – short form (Q-LES-Q-SF), Moo's menstrual distress questionnaire, short form of international physical activity questionnaire.
Conclusion: The study concluded that 6 to 8 ±2 weeks of aerobic exercise is effective in reducing pain and improving QOL in women with primary dysmenorrhea. There are very few recent evidences supporting the topic hence more researches should be conducted.

Keywords: Primary dysmenorrhea, aerobic exercise, pain, quality of life

Introduction
Menstruation is a critical time in the reproductive life of females. The duration of menstrual cycle is usually occurring every 28 days with varies from an average of 6 days [1]. Menstrual pain is mostly occur in lower abdomen and spread to lower back and thighs. Other symptoms are nausea, vomiting, poor concentration, back pain, fatigue, abdominal pain, headache, swelling on feet, general body pain and anxiety and that's the caused by uterine prostaglandins and over production of vasopressin [2].
Dysmenorrhea is the most familiar menstrual distress syndrome and most common gynaecologic problem in women of all ages [3]. The international federation of gynaecology and obstetrics defines primary dysmenorrhea as 'painful cramps in the absence of any visible pelvic pathology that could account for it [4].'
Dysmenorrhea have mainly two types – primary dysmenorrhea, its usually in young adults and defined as cramping pain in the lower abdomen occurring just before or during menstruation; secondary dysmenorrhea, which is associated with existing pelvic pathology [5].
The main cause of primary dysmenorrhea is still remains unknown but the symptoms said that when the uterus suffer from spasticity due to reduced blood supply. The release of prostaglandins and other inflammatory mediators in the uterus that could be one cause of dysmenorrhea. An increase in the amount of prostaglandins leads to uterine contraction [6]. The mainly symptoms of primary dysmenorrhea are tiredness, nausea, vomiting, diarrhoea, headache, dizziness, nervousness, and mood swings and pain [7]. The prevalence of primary dysmenorrhea is 70.2 % in India [8].

The increased production or imbalance of prostaglandins cause increase the intensity of pain due to increase uterine contraction, reduce uterine blood frow, and increase sensitivity of peripheral nerve endings [9]. Some reports are indicated that the level of prostaglandin F2α are twice higher then non dysmenorrheic women [8]. Most prostaglandin F2α are released during the first 48 hours of menstruation, which gives rise to greatest intensity of symptoms [3].

Although primary dysmenorrhea has a negative impact on a women's life, there are several reasons for them to not seek hospital treatment for their symptoms of primary dysmenorrhea like, that symptoms are normal, choosing to manage themselves, limited resources, can't choose appropriate treatment options, symptoms can be tolerated, feels embarrassed or afraid to seek treatment [10].

Primary dysmenorrhea is responsible for disability and inefficiency in terms of absence from the school and workplace. The feeling of pain, fatigue and mood swings due to primary dysmenorrhea influence women's social life [9]. That's also decrease the academic performance, sports participance, and socialization [3].

Aerobic exercises know to synchronize metabolic activities and sustain blood flow, which in turn enhance the functions of pelvic organs. It helps in releasing of endorphin hormones in the brain that raise the pain threshold by initializing prostaglandin inhibitors. Aerobic exercise training can be one of the non-pharmacological treatment for primary dysmenorrhea [7].

The aim of the study is to find out effect of aerobic exercise on pain and quality of life in women with primary dysmenorrhea. And the objectives are to find out effectiveness of aerobic exercise on reducing pain and improving of quality of life in women with primary dysmenorrhea, and if there is possibility then what can be the adequate duration of aerobic training to be effective.

Material and Methodology

Articles been selected from PubMed, Google Scholar and Research Gate by using keywords and that are primary dysmenorrhea, pain, quality of life\QOL and aerobic exercise. Total 6 articles were selected from previous 5 years and fulfilling inclusion criteria.

Inclusion criteria

- Mentioned duration of intervention.
- Article includes the outcomes are pain and quality of life.
- Available in English language.
- Free open access and available in full text.
- Eligible age group: 17 to 43 years
- Intervention duration: 4 weeks to 7 months.

Outcomes

- For pain-Premenstrual syndrome scale, visual analogue scale, short form McGill pain questionnaire, numerical pain rating scale.

For QOL- 12 item short form health survey, quality of life enjoyment & satisfaction questionnaire – short form (Q-LES-Q-SF), Moo's menstrual distress questionnaire, short form of international physical activity questionnaire.

Summary of Reviewed Articles

Group aerobic training and primary dysmenorrhea

Eda Ekbas and Emin Ulas Erdem conducted an experimental study on women have 18 to 25 years age to check effectiveness of group aerobic training on menstrual cycle symptoms in primary dysmenorrhea. They included 37 participants and divided them in to two groups as exercise group have 18 participants and control group have 19 participants and they take premenstrual syndrome scale, visual analogue scale and short form 36 for assessment. Participants in exercise group participated in 4 weeks group aerobic training program for 3 times week and per session was approximately 50 minutes in those 5 minutes warmup, 40 minutes aerobic training and 5 minutes cooldown period. They concluded that 4 weeks group aerobic training program is effective in reducing premenstrual symptoms contributed to reduce menstrual symptoms and improve quality of life in female with primary dysmenorrhea [2].

Regular aerobic exercise and primary dysmenorrhea

Roghayeh Moradpour conducted a quasi-experimental study on 20 young girls with age of 20 to 25 years age to get the effect of regular aerobic exercise on primary dysmenorrhea thus he divided them in to two group of 10 in exercise group and 10 in control group. In exercise group run for 10 to 15 × 2 to 5 minutes with maximum heart rate for 3 days per week for 8 weeks and they were assessed with Moo's menstrual distress questionnaire to evaluate psychological and physical symptoms and they got concluded that the aerobic exercises positively influence the physical menstrual symptoms [3].

Treadmill based aerobic exercise and pain, daily functioning and QOL

Priya Kannan *et al*. conducted a Randomized controlled trial on 55 women with 18 to 43 years aged group to be aware of effectiveness of a treadmill based aerobic exercise on pain, daily functioning and quality of life in women with primary dysmenorrhea. They have divided them in to two group for experimental group have 27 participants and usual care group have 28 participants. They were collected the information for participants with short form McGill pain questionnaire, 12 item short form health survey, visual analogue scale and short form international physical activity questionnaire. The intervention for participants were 30 minutes in those 10 minutes warmup and 10 minutes for cool down that for daily for 3 weeks per month for 7 months and the 4 weeks were supervised under expert and next 6 months home program. In the end they were concluded that the effect on pain is improved and maintain the effect for 7 months for daily functioning, quality of life and to prevent the pain [4].

Effect of aerobic exercise and primary dysmenorrhea

Zahra Mohebbi Dehnavi *et al*. conducted a clinical trial study on 70 college going students to get effect of aerobic exercise on primary dysmenorrhea. They divided them in to two group for experimental group (35) and control group (35). The intervention for experimental group was for 30 mins per session and it include warm up, exercise period and cool down period, and that's for 3 times per week for 8 weeks. They were assessed the subject with visual pain questionnaire at first 3 days of menstruation. They were got result that the severity of pain in interventional group at the

end of 4th weeks of intervention was not significant but the end of 8th week after intervention showed significant changes [6].

Stretching exercise versus aerobic dance and primary dysmenorrhea

G. Tharani *et al*. conducted an experimental study on 30 collegiates to compare the effect of stretching exercise versus aerobic dance in primary dysmenorrhea so they divided them in to two groups, group A include 15 students and they receiving stretching exercise and group B include 15 student and they receiving aerobic dance training for 45 minutes that include 10 minutes warm up 25 minutes dance training and 10 minutes cool down session for 3 days per week for 8 weeks. They were taken visual analogue scale and depression - anxiety and stress scale (DASS-21) as pre-test and post-test from both groups. They were concluded that aerobic dance can reduce symptoms of primary dysmenorrhea and overcome pain in primary dysmenorrhea and that's the one of non-pharmacological treatment [7].

Aerobic exercise on quality of life and primary dysmenorrhea

Stella Adaora and Anjali Suresh *et al*. conducted an experimental study on 60 female students of 18 to 25 years age group for a study to effect of aerobic exercise on quality of life in primary dysmenorrhea in Bangalore city. They divided subjects in two groups as 30 in experimental group - A and 30 in control group – B and group A getting exercise training for total 45 minutes, in those 10 minutes warmup, 30 minutes for aerobic exercise at moderate intensity and 5 minutes for cool down for 4 times per week for 12 weeks. They were assessed the subject for pretest and posttest with visual analogue scale, verbal multidimensional scoring system (VMSS), 3 minutes step test and quality of life enjoyment and satisfaction questionnaire - short form (Q-LES-Q-SF) and they were concluded that this protocol of aerobic exercise are effective on reduce pain and improve quality of life in women with primary dysmenorrhea [11].

Conclusion

According to recent evidences, it is concluded that the effect of aerobic exercise can be one of the non-pharmacological treatment, which reduces pain and improves the quality of life of women with primary dysmenorrhea.

Some studies have shown that 4 weeks of intervention was not significant however at the end of 8th week of intervention the study have shown significant changes.

From this review it is concluded that 6 to 8 ± 2 weeks of aerobic exercise programme is effective in reducing pain and improving QOL in women with primary dysmenorrhoea. Positive effect have been seen in reducing symptoms of primary dysmenorrhea and can prevent the occurrence of certain menstrual disorder.

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