

Comparison of Aerobic versus Stretching Exercise Programmes on Pain and Menstrual Symptoms in Subjects with Primary Dysmenorrhea

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Abstract

Objective: To compare the effectiveness between Aerobic and Stretching exercise programs on pain and menstrual symptoms in subjects with primary dysmenorrhea.

Study Design: Quasi Experimental study design.

Subjects: 100 subjects were taken in the study, age group between 16 to 26 years and divided into 2 groups (50-group A, 50-group B).

Intervention: 50 subjects in the A group participated in aerobic exercise programme and 48 patients in the B group participated in stretching exercise programme.

Outcome Measure: Moos Menstrual Distress Questionnaire, Numerical Pain Rating Scale.

Results: Statistical analysis was done by using paired t-test for within the group comparison and student t-test used to compare between the two groups, results were not statistically significant difference in pain intensity and menstrual symptoms between two groups but group A had better clinical outcome with Moos Menstrual distress Questionnaire.

Conclusion: It is concluded that there is no significant difference between aerobic versus stretching exercise programmes over pain and menstrual symptoms in subjects with primary dysmenorrhea but group A trained with aerobic exercises had better clinical outcome with Moos Menstrual distress Questionnaire especially physiological, psychological, behavioral symptoms than group B trained with stretching exercises.

Keywords: Dysmenorrhoea; Stretching; Aerobic exercises; Menstruation; Antidepressants

Introduction

Dysmenorrhea is the most common problem prevailing in women of reproductive age. It can be divided into two broad categories of primary and secondary (menstrual pain associated with underlying pelvic pathology) [1-3]. Primary Dysmenorrhea or painful menstruation, in absence of any specific pelvic diseases, is one of the most common gynaecological problems worldwide [3]. Primary Dysmenorrhea begins when young girls first experience the ovulatory cycles at puberty and its prevalence increases during adolescence (15-17 years) and reaches to its highest in 20- 24 years and decreases progressively thereafter [1].

In primary Dysmenorrhea, pain begins few hours before and lasts for 24-48 hours after the onset of menstruation. The pain is more in the first day and rarely continues to the second day [2,4]. Primary Dysmenorrhea is characterized by cramping lower abdominal pain that may radiate to lower back and upper thighs and is commonly associated with nausea, headache, fatigue, and diarrhoea [5]. The true incidence and prevalence of Primary Dysmenorrhea are not clearly

established in India. Prevalence of Primary Dysmenorrhea varies from 33% to 79.67%. This affects 60% of females, with systemic symptoms such as headache (60%) lower back pain, nausea and vomiting (80%) diarrhoea (50%) irritability (30%) and adynamia (45%) [6,7].

The Physiological reason for Primary Dysmenorrhea is hypothesized to be the production of uterine prostaglandins during endometrial sloughing. During pre-menstrual phase, Progesterone increases the amplitude and frequency of uterine contraction and cause vasospasm of the uterine arterioles resulting in ischemia and cyclical lower abdominal cramps [1]. In many countries, short-term school and work absenteeism in young girls and women about 34 to 50% are mostly due to Primary Dysmenorrhea. Indeed, as reported by many studies, there is a considerable loss to both the individual and society as a result of Primary dysmenorrhea [4]. Since long time, the treatments for Primary Dysmenorrhea include administration of antidepressants and tranquilisers, hormonal treatments such as oral contraceptives, counselling and psychotherapy [8].

Stretching also has been found to cause significant decrease in Physical and Psychological symptoms of primary dysmenorrhea. It decreases symptoms of Dysmenorrhea such as lack of concentration, behavioral changes, breast pain and inflation, anxiety, pain duration and intensity [1]. Recently, Aerobic exercises have been advocated as a

therapeutic manifest for the physical symptoms of Primary Dysmenorrhea. Aerobic exercises are more beneficial because they improve pelvic and extrapelvicorgans functioning by adjusting metabolism, hydroelectric balance, hemodynamic conditions and blood flow [6].

Aerobic Exercises are known to cause the release of endorphin hormones in brain that raise the pain threshold by activating the prostaglandin synthesis inhibitors and may acts as distraction thoughts, decreasing short term depression and increase concentration and improve mood and behavior. However, surprisingly little research has evaluated the effects of aerobic exercise on menstrual cycle symptoms and mood states [1,9]. So, the aim of this study is to compare the effectiveness between aerobic and stretching exercise programmes over pain and menstrual symptoms in subjects with primary Dysmenorrhea.

Methodology

100 Subjects who had diagnosed with primary Dysmenorrhea were taken in to the study. It is a comparative study. This study was conducted for three months in SRM University.

Subjects included in the study who are diagnosed with primary Dysmenorrhea, Age between 16-26 years, diagnosed with Primary Dysmenorrhea, Dysmenorrhea for at least 2-3 days, regular menstrual cycle. Informed consent was taken from the subjects before the treatment. Subjects who has Irregular or infrequent menstrual cycle, Intra-uterine contraceptive device, Oral contraceptive pills, Hyperthyroidism, Hypothyroidism, Secondary Dysmenorrhea, Any hormonal therapy, Polycystic Ovarian Disease were excluded from the study.

The outcome measures of the study are as follows below Moo's Menstrual Distress Questionnaire to assess the severity of symptoms of Dysmenorrhea. Numerical Pain Rating Scale to assess the intensity of pain. The treatment protocol for Group A and Group B was given to the subjects with primary Dysmenorrhea of two different groups followed as explained below.

Group A

An exercise session lasting 40 minutes which comprises

- 1.10 minutes of stretching exercises (hamstring, whole spine and Tendoachilles)
- 2.20 minutes of aerobic exercises (walking or cycling), (Borgs score-12-14)
- 3.10 minutes of relaxation exercises (Deep Breathing exercises) (3 times a week)

Participants will be asked to record on a calendar when they complete the prescribed exercises each day. They will be followed up for 3 menstrual cycles and each month the subjects will be evaluated with the Numerical pain rating scale and Moos Menstrual Distress Questionnaire to monitor prognosis.

At each visit, compliance with the exercise intervention will be checked by reviewing the information on the diary.

Group B

This group will be educated with four types of physical activities:

- The subjects will be asked to lie face up with legs and knees bent and they are instructed to perform abdominal breathing about 10 times.
- The subjects will be asked to stand holding backs of chair, and then the subjects will be asked to lift one heel off the floor, then the other and repeat 20 times.
- The subjects will be asked to stand holding back of chair then they will be instructed to do 5 deep knee bends.
- The subjects will be asked to lie on back, and they will be instructed to lift and bring knees to touch chin, repeat 10 times.

The subjects were instructed to do all the above physical activities twice a day for 20 minutes. After first and second cycle again all subjects were filled the Moos menstrual distress questionnaire and numerical pain rating scale. Total 3 times they filled the forms during the study duration.

In Table 1, p is less than 0.001 for all three subsequent months, which shows that there is a highly significant difference in Numerical Pain Rating Scale in Group A subjects after training with aerobic exercises (Table 1).

| Variables | Pre-Test | Post-Test | S.D. | T-test | sig |
|--|----------|-----------|------|--------|-------|
| | Mean | Mean | | | |
| NPRS Pre Test-Post Test after 1 month | 7.15 | 6.4 | 0.53 | 9.88 | 0.000 |
| NPRS Pre Test-Post Test after 2 months | 7.15 | 5.23 | 0.54 | 24.63 | 0.000 |
| NPRS Pre Test-Post Test after 3 months | 7.15 | 4.4 | 0.72 | 29.8 | 0.000 |

Table 1: Comparison of Pre-test and Post-test values of Numerical pain rating scale of Group A subjects treated with Aerobic exercises (P<0.001).

Figure 1 shows that there is no significant difference in Numerical Pain Rating Scale between Group A subjects trained with aerobic exercises and Group B subjects trained with stretching exercises for all three consecutive months (Figure 1).

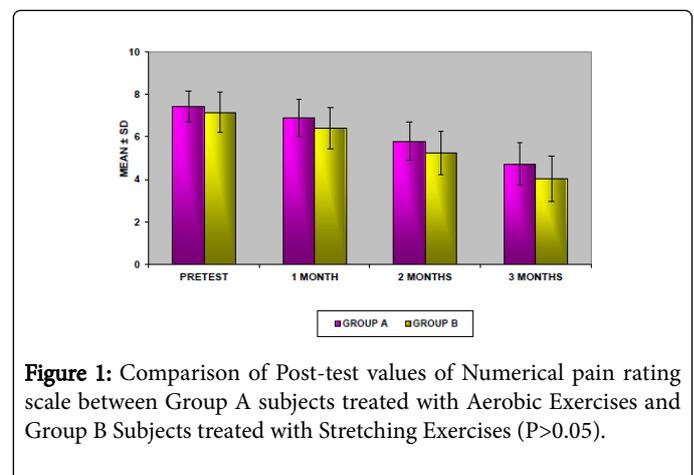


Figure 1: Comparison of Post-test values of Numerical pain rating scale between Group A subjects treated with Aerobic Exercises and Group B Subjects treated with Stretching Exercises (P>0.05).

In Table 2, p is less than 0.001 for all three subsequent months, which shows that there is a highly significant difference in Numerical

Pain Rating Scale in Group B subjects after training with Stretching exercises (Table 2).

| Variables | Pre-Test | Post-Test | S.D. | T-test | sig |
|--|----------|-----------|------|--------|-------|
| | Mean | Mean | | | |
| NPRS Pre Test-Post test after 1 month | 7.42 | 6.9 | 0.51 | 7.286 | 0.000 |
| NPRS Pre Test-Post test after 2 months | 7.42 | 5.8 | 0.64 | 18.03 | 0.000 |
| NPRS Pre Test-Post test after 3 months | 7.42 | 4.74 | 0.79 | 23.87 | 0.000 |

Table 2: Comparison of Pre-test and Post-test values of Numerical pain rating scale of Group B subjects treated with Stretching Exercises (P<0.001).

In Table 3, p is less than 0.001 for all three subsequent months, which shows that there is a highly significant difference in Moos Menstrual Distress questionnaire in Group A subjects after training with aerobic exercises (Table 3).

| Variables | Pre-Test | Post-Test | S.D. | T-test | sig |
|--|----------|-----------|--------|--------|-------|
| | Mean | Mean | | | |
| MMDQ Pre Test-Post Test after 1 month | 60.37 | 58.06 | 2.266 | 7.125 | 0.000 |
| MMDQ Pre Test-Post Test after 2 months | 60.37 | 52.78 | 17.172 | 3.095 | 0.003 |
| MMDQ Pre Test-Post Test after 3 months | 60.37 | 50.84 | 17.931 | 3.721 | 0.001 |

Table 3: Comparison of Pre-test and Post-test values of Moos Menstrual Distress Questionnaire of Group A subjects treated with Aerobic exercises (P<0.001).

In Table 4, p is less than 0.001 on comparing pretest and post-test of first month and post-test of third month. Whereas, p<0.005 on comparing the pretest with the post test of second month, which shows that there is a highly significant difference in Moos Menstrual Distress questionnaire for all three subsequent months in Group B subjects after training with stretching exercises (Table 4).

| Variables | Pre-Test | Post-Test | S.D. | T-test | sig |
|--|----------|-----------|------|--------|-------|
| | Mean | Mean | | | |
| MMDQ Pre Test-Post Test after 1 month | 60.58 | 57.68 | 2.85 | 7.209 | 0.000 |
| MMDQ Pre Test-Post Test after 2 months | 60.58 | 54.08 | 6.23 | 7.357 | 0.000 |
| MMDQ Pre Test-Post Test after 3 months | 60.58 | 51.28 | 9.21 | 7.138 | 0.000 |

Table 4: Comparison of Pre-test and Post-test values of Moos Menstrual Distress Questionnaire of Group B subjects treated with Stretching exercises (P<0.001, p<0.005).

Figure 2 shows that there is no significant difference in Moos Menstrual Distress questionnaire between Group A and Group there is no significant difference in Moos Menstrual Distress questionnaire for all consecutive three months (Figure 2).

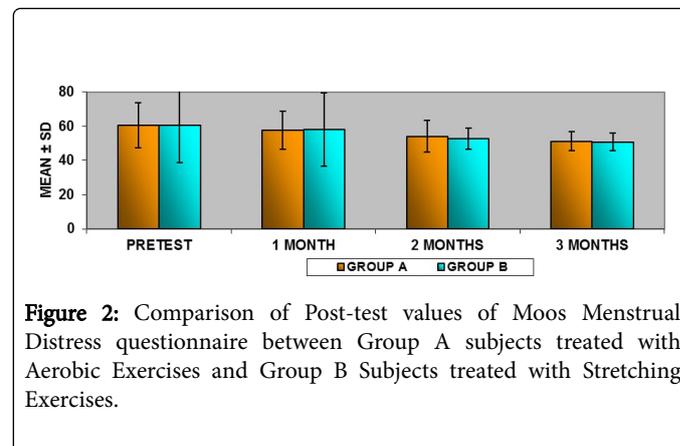


Figure 2: Comparison of Post-test values of Moos Menstrual Distress questionnaire between Group A subjects treated with Aerobic Exercises and Group B Subjects treated with Stretching Exercises.

Discussion

This study is focused on comparison of Aerobic versus Stretching exercise programmes over pain and menstrual symptoms in subjects with primary dysmenorrhea. Previously anti-depressants, hormonal treatments are used mostly in the management of primary dysmenorrhea. Later several observational studies reported that exercises reduce the prevalence of primary dysmenorrhea. Little researches have evaluated the effects of aerobic exercises over primary dysmenorrhea. Recently stretching is also been found to be effective in reducing the physical and psychological symptoms of primary dysmenorrhea.

So, in this study we had compared aerobic exercises with stretching exercises over pain and menstrual symptoms in subjects with primary dysmenorrhea. The statistical results of this study shows that the intensity of pain which was measured by Numerical pain rating scale after the exercise intervention, had started to decrease after starting the aerobic exercises in Group A subjects and had continued to decline in subsequent three menstrual cycles, P value is less than 0.01 (p<0.01) (Table 1).

Izzo and Labriola, have suggested that improved metabolism of blood flow at the pelvic level, which occurs during exercises, might influence primary dysmenorrhea. In this study, statistical results shows statistically significant reduction in intensity of pain for subsequent three months which was measured by Numerical pain rating scale after the commencement of stretching exercises for Group B subjects, P value is less than 0.01 (p<0.01) (Table 2).

The results of this study go in hand with Elham et al. who stated that selected stretch training had positively influenced Primary dysmenorrhea symptoms [10]. The statistical reviews of the study suggest that there was a significant reduction in menstrual symptoms measurement through Moos Menstrual Distress Questionnaire in subsequent three months in Group A subjects trained with aerobic exercises, P value less than 0.01 (p<0.01) (Table 3).

This result was best supported with Julie brown et al. who stated that exercises reduced the Moos Menstrual Distress Questionnaire score during menstrual phase and resulted in a sustained decrease in symptoms over three observed cycles [5]. The result of this study shows

a great significant reduction in menstrual symptoms measured through Moos Menstrual Distress Questionnaire in Group B subjects trained with stretching exercises. P is less than 0.01 ($p < 0.01$) (Table 4).

Both Numerical pain rating scale and Moos Menstrual Distress Questionnaire, the two outcome measures in this study, showed immediate improvements after starting the different exercise interventions and continued to improve over time in the three subsequent menstrual cycles. But the aim of the study was to compare the aerobic versus stretching exercise programs over pain and menstrual symptoms in subjects with primary dysmenorrhea. Though the statistical analysis, Numerical pain rating scale and Moos Menstrual Distress Questionnaire showed no difference or they are quite the same in improvement of pain and menstrual symptoms between Group A subjects trained with aerobic exercises, Group B subjects trained with stretching exercises. P is greater than 0.05 ($p > 0.05$) (Figures 1 and 2).

Interpretation of results shows that Group A subjects trained with aerobic exercises showed better improvement in Moos Menstrual Distress Questionnaire than Group B subjects, although results were not statistically significant, it is clinically significant that aerobic exercises showed a better improvement in menstrual symptoms than stretching exercises.

Aerobic exercises are widely accepted as a mean of moderating stress and biochemical changes in immune system, a mechanism by which exercises may improve the symptoms of primary dysmenorrhea as articulated by Gannon.

Thus aerobic exercises decrease sympathetic activity and reduce the menstrual symptoms like depress mood, fatigue, stress and behavioural symptoms and had showed a clinically significant reduction in Moos Menstrual Distress Questionnaire and showed a better clinical outcome than stretching exercises in subjects with primary dysmenorrhea, so aerobic exercises can be recommended in clinical setup for better clinical result for subjects with primary dysmenorrhea. Target heart rate was not measured for aerobic exercises. Can include health related quality of life questionnaire also as outcome measure [11-34].

Conclusion

This study focused on the comparison of Aerobic versus Stretching exercise programmes over pain and menstrual symptoms in subjects with primary Dysmenorrhea. The results of this study were not statistically significant indicating no difference in pain intensity and menstrual symptoms as measured by Numerical Pain rating scale and Moos Menstrual distress questionnaire between Group A subjects trained with aerobic exercises and Group B subjects trained with stretching exercises. The Group A subjects trained with aerobic exercises had a better clinical outcome with Moos Menstrual Distress Questionnaire, especially physiological, psychological, behavioural symptoms than Group B trained with stretching exercises.

Thus, this study concludes that there is no significant difference between Aerobic versus stretching exercise programmes over pain and menstrual symptoms in subjects with Primary Dysmenorrhea.

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