ijlpr 2020; doi 10.22376/ijpbs/lpr.2020.10.4.L16-20

International Journal of Lifescience and Pharma Research

Research Article

Physiotherapy for Better Pain Management

Effectiveness of Chair Aerobics and Swiss Ball in Primary Dysmenorrhoea

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Abstract: Dysmenorrhoea is the pain that occurs during menstruation. It is one of the common gynaecological disorders that affects women's quality of life and day to day activities. Primary dysmenorrhoea (PD) is characterised by cramping lower abdomen pain that may radiate to the lower back and upper thigh. Associated complaints include stress, depression, headache and diarrhoea. The overall prevalence of primary dysmenorrhoea is about 60% - 90%. There are many conservative treatments for primary dysmenorrhoea conditions but more effective one is not yet known. Hence it is necessary to find the effectiveness of chair aerobics and swiss ball in primary dysmenorrhoea. The study was conducted with 50 subjects in and around Krishna Institute of Medical Sciences campus who have primary dysmenorrhoea symptoms. The subjects are divide into two groups, Group A and B. Group A were given chair aerobics exercises and Group B were given swiss ball exercises. The result of this study was analysed by the basis of pre-test and post-test assessment of VAS and VMSS. Arithmetic mean & standard deviation was calculated for each outcome measure. MS Excel was used for drawing various graphs with given frequencies. According to the pre-test and post-test analysis the result showed that swiss ball exercises are statistically significant in reducing VAS and VMSS score than chair aerobics exercises in primary dysmenorrhoea. On the basis of the results it is concluded that the swiss ball exercises are more effective than chair aerobics in decreasing pain and improving quality of life in primary dysmenorrhoea.

Keywords: Primary dysmenorrhoea, Chair aerobics, Swiss ball, VAS, VMSS.

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Recieved On 06 February 2020
Revised On 11 March 2020
Accepted On 20 April 2020
Published On 01 October 2020

Funding This research did not receive any specific grant from any funding agencies in the public, commercial or not for profit sectors.

Citation Ms Mintu Merin Koshy, Dr. Smita Patil, Dr. Chandrakant Patil, Dr. Khushboo Chotai , Effectiveness of Chair Aerobics and Swiss Ball in Primary Dysmenorrhoea.(2020).Int. J. Life Sci. Pharma Res.10(4), L16-20 http://dx.doi.org/10.22376/ijpbs/lpr.2020.10.4.L16-20

1. INTRODUCTION

Dysmenorrhoea means cramping pain accompanying menstruation[1]. The word dysmenorrhoea is obtained from the Greek word "Dys" (difficult, painful, abnormal), "meno" (month) and "rhea" (flow). It affects the quality of life and responsible for highest number of absentees which results in loss of work hours and economic loss[2]. Women experience sharp, intermittent spasm like pain which usually concentrates in the supra pubic area[3]. Dysmenorrhoea can be classified into primary and secondary dysmenorrhoea. Primary dysmenorrhoea refers to pain that is not associated with any identifiable pelvic pathology. It is now proven that pathogenesis of pain is due to biochemical derangement. Secondary dysmenorrhoea refers to pain that occurs due to the presence of organic pelvic pathology such as fibroids, adenomyosis, pelvic inflammatory disease (PID) and endometriosis[1]. Primary dysmenorrhoea is characterised by pain in the lower abdominal region which may radiate to lower back and thighs. Associated complaints include nausea, vomiting, mood swings, headache, fatigue and diarrhoea[2]. The main cause of primary dysmenorrhoea is increased level of prostaglandins. Prostaglandins especially PGF_2 which stimulate myometrial contractions reduces uterine blood flow causing uterine hypoxia. Hypoxia is responsible for cramping pain in primary dysmenorrhoea[5]. The factors that worsens the pain include extroverted uterus, lack of exercise and psychological and social stress [6,7]. Risk factors include early menarche, long menstrual periods, smoking, obesity and alcohol consumption, social and psychological stress[6]. The American College of Sports Medicine (ACSM) definition for exercise used as "exercise is physical activity characterised by using planned and structured repetitive movements to increase or maintain physical fitness"[5,8]. Exercises help to decrease dysmenorrhoea by reducing mental stress, improves mood and reduce body fat which is proven that obesity is associated with high prevalence of dysmenorrhoea. It is also proven that lifestyle factors have a main role in primary dysmenorrhoea. Improving lifestyle can reduce the severity of primary dysmenorrhoea [9]. Many literatures have proved that exercises are effective in primary dysmenorrhoea hence we are comparing the chair aerobics and swiss ball exercises in subjects having primary dysmenorrhoea symptoms to find which is more effective in decreasing pain and improving quality of life in primary dysmenorrhoea. Chair aerobics is defined as the physical activity of low intensity which is performed by sitting on a chair and depends on the aerobic energy generating process [10]. Swiss ball exercises include exercises that are performed on a swiss ball[4]. Research has proven that women who are doing regular exercise had less pain as compared to those who are not doing exercise[4]. Earlier research proved that chair aerobics and swiss ball therapy are helpful in reducing pain in primary dysmenorrhoea. However there are limited studies to show the significance to compare the effect of chair aerobics and swiss ball in primary dysmenorrhoea

2. METHODS

The study was conducted in Krishna Institute of Medical Sciences Deemed To Be University campus. The approval for this study was obtained from the protocol committee and the institutional ethical committee. 50 subjects were selected by simple random sampling method based on inclusion and exclusion criteria.

2.1 Inclusion criteria: Subjects with an age group of 18-25 years and those who having any primary dysmenorrhoea symptoms such as nausea, abdominal and back pain, diarrhoea.

2.2 Exclusion criteria: Subjects who have secondary dysmenorrhoea conditions, recent abdominal surgeries and other gynaecological conditions.

The subjects were divided into two groups ,Group A and Group B. Group A subjects were given chair aerobics exercises and Group B were given swiss ball exercises. Then the treatment protocol was explained to the patients and received written consent from them. The period of this treatment was about 8 weeks. After that we conducted pre-test assessment of VAS and VMSS .Then we asked the subjects to do various exercises on swiss ball and chair aerobics. After the end of the treatment session we conducted post-test assessment of VAS and VMSS and compare the pre and post assessment.

2.3 Ethical clearance

The institutional committee has hereby given permission to initiate the research project (Protocol number 08/2019-2020) titled, "effectiveness of chair aerobics and swiss ball in primary dysmenorrhoea.

2.4 Group A

2.4.1 Chair Aerobics Exercises

The subjects were requested to perform all the following exercises for 4 days per week for about 8 weeks.

- Knee lifts
- Diagonal toe touch
- Lunges
- Criss cross (along with arm movement)

2.5 Group B

2.3.1 Swiss Ball Exercises

The subjects were requested to perform all the following exercises for 10 sec hold×12 times/set×3 sets/day×3 days/week×8 weeks.
Knee tucks
Hamstring curls
Back extension

3. STATISTICAL ANALYSIS

Statistical analysis was done manually and by using the statistics software INSTAT to verify the results derived. The statistical analysis was done by using unpaired t test and paired t test. Unpaired t test was used to find the pre and post intervention within the group. Paired t test was used to find the statistical analysis between group A and B (pre-pre and post-post results).

4. RESULT

50 subjects were selected. The mean age of Group A & B was 22.4±0.5000 and 21.32±0.9000 respectively. The results obtained were according to the pre and post test assessment of VAS and VMSS.

Table 1: Results Of Age				
Age	Mean	SD	P value	Interference
Group A	22.4	0.5000	<0.0001	Extremely significant
Group B	21.32	0.9000	<0.0001	Extremely significant

Table 2: Results Of Visual Analogue Scale										
Visual analogue scale										
	On rest				On activity					
	Pre test		Post test		Pre test		Post test			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	p value	Interference
Chair aerobics	5.92	1.22	5.36	1.15	5.76	1.12	5.28	1.06	<0.0001	Extremely significant
Swiss ball	5.6	1.13	4.52	1.19	5.44	0.91	4.16	1.06	<0.0001	Extremely significant
p value	0.378		0.946		0.2726		0.0005			
Interference	Not significant		Extremely significant		Not significant		Extremely significant			

Group A subjects were given chair aerobics exercises. VAS score for pre-test (on rest) had a mean of 5.92±1.22 and post-test(on rest) was with a mean of 5.36±1.15 with a p value of (<0.0001) which is extremely significant. VAS score for pre-test (on activity) had a mean of 5.76±1.12 and post-test had a mean of 5.28±1.06 (on activity) with a p value of (<0.0001) which is extremely significant. Group B subjects were given swiss ball exercises .VAS score for pre-test (on rest) was with a mean of 5.6±1.13 and post-test(on rest) with a mean of 4.52±1.19 with a p value (<0.0001)which is extremely significant. VAS score of pre-test (on activity) was with a mean of 5.44±0.91 and post-test (on activity) with a mean of 4.16±1.06 with a p value (0.0001) which is extremely significant. After comparing the pre and post-test of VAS of Group A&B it shows that the p value (pre-pre test) at rest is 0.378 which is not significant. p value of (post-post test) at rest is 0.946 which is extremely significant. On activity the p value of (pre –pre test) is 0.2726 and post –post test is 0.0005 which is extremely significant.

Table 3: Results of Verbal Multidimensional Scoring System						
Verbal multidimensional scoring system						
	Pre test		Post test			
	Mean	SD	Mean	SD	p value	Interference
Swiss ball	1.68	0.62	1.08	0.64	<0.0001	Extremely significant
Chair aerobics	2.08	0.57	1.8	0.64	0.0162	very significant
p value	0.0225		0.0002			
Interference	Not significant		Extremely significant			

Above table shows the VMSS for Group A&B. Pre-test shows with a mean of 1.68 ±0.62 and p value (0.0001) which is extremely significant .Post test result was with a mean of 1.08±0.64 and p value (0.0162) which is very significant. After comparing the values of pre and post-test of two groups shows that pre-test with a p value of 0.0225 which is not significant and post-test with a p value of 0.0002 which is extremely significant.

5. DISCUSSION

Dysmenorrhoea is pain during menstruation**.** It is estimated that 16%-93% of women suffer from dysmenorrhoea in reproductive age. Primary dysmenorrhoea (PD) is characterized by cramping lower abdomen pain that may radiate to the lower back and upper thigh and commonly associated with stress, headache and diarrhoea and thereby decreases the quality of life[4]. Pain in general has a disabling nature and makes dysmenorrhoea stressful, and becomes an important irritating factor for women. Usually women will ignore these discomforts and continue their daily activities with the support of analgesics or conventional methods. Many studies have proven that exercises are effective in primary dysmenorrhoea [2,4]. This study "Effectiveness of Chair aerobics And Swiss ball in primary dysmenorrhoea" was conducted to find the effects of these therapies and to compare the treatment protocols such as Swiss ball and Chair aerobics. The objectives of this study is to find the effectiveness of chair aerobics in primary dysmenorrhoea to reduce pain and improve quality of life. To find the effectiveness of Swiss ball in primary dysmenorrhoea to reduce pain and improve quality of life. To compare the effectiveness of Chair aerobics Versus Swiss ball in primary dysmenorrhoea. The study was conducted with 50 subjects. Subjects were divided into two groups. Chair aerobics (Group A) and Swiss ball (Group B).Subjects were taken according to the inclusion and exclusion criteria. Prior consent was taken from each subject. Treatment protocol was carried out for 8 weeks. The outcome measures for this study were visual analogue scale (VAS) and verbal multidimensional scoring system (VMSS) [2]. Group A was intervened with Chair aerobics exercises. Chair aerobics is a physical activity of low intensity which is performed while sitting on a chair and it depends primarily on the aerobic energy generating process[2,5,6].The chair aerobics exercises includes Knee Lift, Diagonal toe touch, Lunges, Criss Cross(along with arm movement). Uterine contractions are caused due to release of prostaglandins during menstruation. Hence the blood supply to the uterine muscles gets constricted and muscles go into spasm which causes rise in tension. This produces ischemia of muscles and leads to cramps[2]. Research has proven that the women who took

part in regular, moderate aerobic exercise have less pain and behavioral changes as compared to those women who don't take part in exercises during menstruation[11]. Aerobic exercises increase the release of endorphins by the brain which in turn increase rise in the pain threshold[12].Thus the exercise has an analgesic effect against pain by increasing the blood circulation leading to reducing pain in primary dysmenorrhoea[2]. Group B was intervened with Swiss ball therapy such as Knee tucks, Hamstring curls and back extension[4]. Hamstring curls using the Swiss ball helps to strengthen gluteus maximus, minimus and medius muscle. It also strengthens the abdominal muscles such as transverse abdominis, internal oblique and external oblique. It also improves blood supply and nutrient supply to the lower abdomen and lower back region which helps to relieve menstrual cramps [13]. Back extension improves the strength and stability in lower back, glutes and hamstrings. It stretches and strengthens the core muscles by improving the blood supply, which helps to reduce the menstrual pain. Knee tucks help to strengthen the muscle around the abdomen, legs, arms and back region. It also improves balance, stability and blood supply which helps to ease the menstrual pain [4,13,14]. The results of this study showed that there is a significant difference in reducing the pain and quality of life in both groups (Swiss ball and Chair aerobics)in females with primary dysmenorrhoea. Unpaired t test was used to analyse the effect of swiss ball in primary dysmenorrhoea and showed that there was extremely significant in VAS and VMSS score. A study done by V.Kirthika et al showed that swiss ball therapy proves effective in relieving the pain during primary dysmenorrhoea [4]. Hence it strengthens the core muscle and improves blood supply which in turn reduces pain and improves quality of life. Unpaired t test was used to analyse the effect of chair aerobics in primary dysmenorrhoea and showed that there was significance in VAS and VMSS score. Aerobic exercises increase the release of endorphins by the brain which leads to rise in the pain threshold [6]. This exercise will reduce pain and improve quality of life. Comparison of VAS and VMSS between groups was done by using Paired t test to find out the effectiveness between the groups. Statistical analysis revealed that there was a very significant difference found in pain intensity using VAS and VMSS in both groups post treatment. Hence it showed that pain intensity has decreased and improves the quality of life.

6. CONCLUSION

According to this study, chair aerobics and swiss ball exercises are effective in treating primary dysmenorrhoea by decreasing pain and improving quality of life. Hence here we compare the effectiveness of chair aerobics and swiss ball, and it is proved on the basis of the result obtained that 8 weeks of swiss ball therapy was significantly effective in reducing pain and improving the quality of life of women with primary dysmenorrhoea than chair aerobics exercises.

7. ACKNOWLEDGEMENT

I sincerely thank the management of KIMSDU for allowing me to conduct this study by providing me the necessary requirements. I thank dean Dr.Varadarajulu sir for his support and guidance. My sincere thanks to guide Dr Smita Patil for helping me in my research. I take this opportunity to thank all those who helped to complete this study.

8. AUTHORS CONTRIBUTION STATEMENT

Miss.Mintu Merin Koshy contributed to the study concept and design, acquisition of data and analysis of data. Dr.Smita Patil contributed in drafting the article or revising it critically for important intellectual content. Dr.Chandrakanth Patil and Dr.Khusboo Chotai developed the final approval of the version to be published.

9. CONFLICT OF INTEREST

Conflict of interest declared none.

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