

Benefit of Stability Exercise on Swiss Ball Exercise along with Treadmill Walking in Physiotherapy College Girl Students with PCOS Symptoms: Single Group Pre Post Design

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How to cite this article: M.Prem Kumar, S. Jeya Preethi Angela, S. Kavitha. Benefit of Stability Exercise on Swiss Ball Exercise along with Treadmill Walking in Physiotherapy College Girl Students with PCOS Symptoms: Single Group Pre Post Design. Indian Journal of Physiotherapy and Occupational Therapy.

Abstract

Background: Polycystic ovarian syndrome (PCOS) is a common disorder seen in women at their reproductive age with a prevalence rate of 4 to 12%. Diagnosis of hyperandrogenism or chronic anovulation without any adrenal or pituitary conditions can be called as PCOS. Swiss ball exercises are found to be a better alternative which is safe for the joints, and also demands moderate physical exertion without loading joints to stress. A combined aerobic and Swiss ball exercise protocols help in muscle strengthening, preventing loss of lean muscle mass, reducing obesity, and improves disease-related hyperandrogenism and insulin sensitivity in PCOS.

Aim & objective of the study: To analyze and understand the effect of swiss ball exercises along with aerobic exercises among college girls with polycystic ovarian syndrome.

Data Analysis and Results: This study results shows that there is statistically significant improvement in the variables of Menorrhoea Impact Score (MIS) pre and post mean values of 4.99 and 0.99 in subjects with $p < 0.05$. Thus null hypothesis has been rejected and alternate hypothesis has been accepted for this study.

Conclusion: The study is concluded that there is statistically significant improvement in Menorrhoea Impact Questionnaire score in college girls in and around Madurai with Poly Cystic Ovarian Syndrome after the intervention of Swiss Ball Exercises along with Aerobic Exercises Program for 6 weeks.

Key words: PCOS, Poly Cystic Ovarian Syndrome, Menorrhoea Impact Questionnaire, MIQ, Swiss Ball Exercises, Aerobic Exercises, College Girls.

Introduction

Polycystic ovarian syndrome (PCOS) is a common disorder seen in women at their reproductive age

with a prevalence rate of 4 to 12%¹. Diagnosis of hyperandrogenism or chronic anovulation without any adrenal or pituitary conditions can be called as

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PCOS². The condition was first described by Stein and Leventhal in 1935, which was a combination of oligo-amenorrhea and polycystic ovaries often associated with hirsutism, obesity or acne³. Thus the key findings in subjects with PCOS are hyperandrogenism and chronic anovulation². Clinical features also include acanthosis nigricans and male pattern alopecia⁴.

There is a growing consensus that exercise can restore menses and improve insulin sensitivity without decreasing body weight⁵. In support of this, aerobic training in this study did not result in a significant change in body mass or body composition however despite exercise compliance and supervised training, there was considerable variability among the subjects with weight change from +4kg to -6 kg. Intra-individual variability in weight change is commonly observed in exercise only interventions⁶⁻⁸. It is postulated that aerobic training induces metabolic and/or behavioral compensations which attenuate weight loss in compliant subjects⁶⁻⁸.

A lowering of metabolic rate and reduction in energy expenditure from non-exercise activities are primary candidates of metabolic compensation whereas compliance to the intervention and an increase in dietary intake are examples of behavioral compensation. In our study compliance was excellent and the change in resting metabolic rate was not different between those subjects who lost weight and those who did not. We did not impose a dietary intervention and of course an increase in dietary intake the most likely candidate for the increase in body weight. Studies in overweight/obese women support an increase in energy intake with exercise however the extra calories consumed do not equal or exceed the energy expenditure in exercise⁹⁻¹⁰. A major challenge for studies implementing exercise only interventions in PCOS women is how to handle dietary intake; perhaps dietary counseling should be provided to maintain dietary intake¹¹.

It is found that obesity commonly occur in women with PCOS, which may lead to decrease in strength, postural control and altered biomechanics of lower limbs.¹² Swiss ball exercises, through its activation of global and local core muscles, significantly improves the postural control of individuals with PCOS along with weight reduction. Physical activities demanding

greater amplitude of joint motion may put excessive stress on the joints of those who are obese, and may be a major factor leading to non-compliance¹².

Swiss ball exercises are found to be a better alternative which is safe for the joints, and also demands moderate physical exertion without loading joints to stress. A combined aerobic and Swiss ball exercise protocols help in muscle strengthening, preventing loss of lean muscle mass, reducing obesity, and improves disease-related hyperandrogenism and insulin sensitivity in PCOS¹².

Due to lack of studies on effectiveness of swiss ball exercises along with aerobic exercises on Menorrhoea Impact Score (MIS) based on Menorrhoea Impact Questionnaire (MIQ) leads to do this observational study. The main aim of the study was to analyze and understand the effect of swiss ball exercises along with aerobic exercises among college girls with polycystic ovarian syndrome.

By doing this study with its outcomes, the symptoms of PCOS can be managed early. The consequences of PCOS may be stalled by the interventions of Swiss Ball Exercise with Aerobic Exercises among college girls.

Materials and Methods

78 college girls of Santosh Physiotherapy College from Madurai, Tamilnadu with diagnosed Poly Cystic Ovarian Syndrome for the past 6 months in the age of 18-24 years and BMI of 18.5 to 24.0 were recruited by convenient sampling method in this observational study with their written informed consent. Subject's demographic data of age, sex, BMI and address were recorded. Subjects were intervened with 20 minutes of abdominal curls with swiss ball exercises (Pic.2) on the 75 mm inflated swiss ball along with aerobic exercises on treadmill (Pic. 1) with 10% grade and 5 mph speed for 20 minutes a session with 10 minutes of warm up and 10 minutes of cool down of total 60 minutes a session, 5 sessions for a week for 6 weeks were given to the subjects under the supervision of Physiotherapist who possessed 3 years of Post Masters Degree clinical experience. Subject's pre test Score of Menorrhoea Impact Questionnaire (MID) were recorded and documented.

Subjects were intervened with swiss ball exercises along with aerobic exercises for 60 minutes a session; 5 sessions for a week; 6 weeks. Data were analyzed by using paired student t test with spss 20.0 version for windows. $P \leq 0.05$ kept as significant for all analysis.

Data Analysis and Results

Table 1: Demographic Variables – Age and BMI.

No of Subjects	Variable	Mean±SD
78	Age	23.0 ± 1.57
	Sex	22.33 ± 1.45
	PCOS in months	5 ± 1.47

Table 1 shows the pre test values of Demographic Variables of Age, BMI and PCOS in months of the subjects.

Table 2: Comparison of Pre and Post Mean, Standard Deviation, ‘t’ Value and ‘p’ value of score of MIQ in subjects.

No of Subjects	Variables	Mean Value		SD		T Value	P Value
		Pre	Post	Pre	Post		
78	MIQ Score	15.9	23.1	4.99	0.99	-9.31242	0.00001

Table 2 shows that the pre and post mean, standard deviation, t value and p value of MIQ Score in before and after the intervention of Swiss Ball with Aerobic Exercises in subjects. There is statistically significant improvement in MIQ scores with p with $p \leq 0.05$.

Discussion

This study results shows that there is statistically significant improvement in the variables of Menorrhagia Impact Score pre and post mean values in subjects (Table 4.3.1) with $p < 0.05$. Thus null hypothesis has been rejected and alternate hypothesis has been accepted for this study.

There is significant improvement in Menorrhagia Impact Score in subjects with the intervention Swiss Ball Exercises and Aerobic Exercises with this study results and outcomes. Physiologically there are changes in metabolic activities due to aerobic exercises interventions which are resulted by aerobic mechanisms of energy production in our body. These aerobic exercises lead to hormonal changes particularly insulin which is instrumental to bring the symptoms of PCOS – Poly Cystic Ovarian Syndrome and its symptoms.

Swiss Ball Exercises brings needed core muscles and pelvic floor muscles strength which are framing the outer cover of Uterus and structural stability to Uterus. Thus the subjects with PCOS recruited in this study got more benefits along with aerobic exercises program.

This study results strengthened the view of Prakash J et al., 2021 in their study, concluded that the addition of Swiss ball exercise programme along with aerobic training is beneficial in women with PCOS in reducing body weight, abdominal fat and irregular menses. It is also a safe alternative to high



Pic 1: Subject performing aerobic exercise on treadmill



Pic 2: Subject performing aerobic exercise on treadmill

load exercises, avoiding stress over joints. Swiss ball exercises also improve postural control in subjects with PCOS. Thus the exercise protocols help in providing a non-pharmacological alternative in women with PCOS in modifying their lifestyle and in the management of their condition¹³.

These study results reflecting the concepts of Leanne M. Redman et al, 2011 in their study stated that the recommendations for adopting regular physical activity in the treatment of metabolic and reproductive function in women with PCOS. Importantly regular exercise in women with PCOS has benefits that exceed weight loss with improvement management of the metabolic and reproductive derangements. Exercise studies of longer duration are needed to carefully characterize the mechanisms between changes in insulin sensitivity and ovarian morphology, sex steroid concentration and reproductive function¹⁴.

But it was a relatively short duration of study and subjects with 19 to 23 year of age were only included in this study. Certain factor such as nutritional factors, psychological status could not control during the period of study. Further this study can be done in comparative or experimental design.

Conclusion

The study is concluded that there is statistically significant improvement in Menorrhoea Impact Questionnaire score in college girls in and around Madurai with Poly Cystic Ovarian Syndrome after the intervention of Swiss Ball Exercises along with Aerobic Exercises Program for 6 weeks.

Ethical Clearance: Taken from Institutional Ethical Review Board, Santosh College of Physiotherapy, Madurai.

Conflict of Interest: Nil

Source of Funding: Self

Acknowledgement: Dr.S. Rajasekar, The Dean, Institute of Physiotherapy, Srinivas University, Mangaluru, Karnataka for providing valuable inputs in technical writing of the manuscript.

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