

Effects of Pilates Versus Pelvic Muscle Strengthening Exercise on Stress Urinary Incontinence - A Comparative Study

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ABSTRACT

Background and Objective: Urinary incontinence (UI) is one of the priority health issues recognized by WHO. It is very common and distressing medical condition severely affecting quality of life (QOL). There are different conservative management focusing on treatment for Stress Urinary Incontinence (SUI) includes improving the way of living by bladder re-training, pelvic floor muscle strengthening exercises, biofeedback, vaginal cones and electrical stimulation of pelvic floor muscles. Therefore, the aim of the present study was to find out the effect of Pilates versus Pelvic floor muscle strengthening exercise in females with stress urinary incontinence.

Methodology: Total 90 patient were enrolled into the study and the study intervention were given to the patients in two separate group physiotherapy group (45 patients) and Pilates group (45 patients). Intervention was given to the patients for 6 weeks. Outcome measures were recorded in the form of score of Pelvic floor muscle strength and Kings Health questionnaire.

Results: Data was analyzed using Paired and unpaired 't' test and showed that there was significant improvement seen in both the outcome measures when compared within the groups. While intergroup comparison Pilates group showed significant improvement in both the outcome measures compare to Kegel's exercise.

Conclusion: Pilates method can be used for treatment option for stress urinary incontinence as it showed same effects as PFM strengthening.

Keywords: Kegel's exercise, Pelvic floor strengthening exercise, Pilates exercise, Stress urinary Incontinence.

INTRODUCTION

Urinary Incontinence is defined by International Continence Society as "a condition in which involuntary loss of urine which is objectively demonstrable with such a degree of severity that is a social and hygienic problem and affecting the quality of life severely. [1]

UI is a universal health problem with the prevalence varying from 8-45% in different studies.

According to survey for prevalence of urinary incontinence in Asia, the prevalence of urinary incontinence in India was 12%. There are various types of Urinary

Incontinence: Stress, Urge, Giggle, Mixed, Overactive Bladder, Nocturnal Enuresis and more. [1,2,3]

TYPES OF URINARY INCONTINENCE

UI is the involuntary loss of urine. UI is most commonly caused by incompetence of urethral sphincter. Incontinence can be caused by a weak vagina, pipe stem urethra, denervation in neurogenic patients, or estrogens deficiency. UI has a great influence on quality of life and affects mostly the elderly. [4]

There are three main types of UI:

- 1) Urge Incontinence,
- 2) Stress Incontinence, and
- 3) Mixed Incontinence.

Stress Incontinence is the complaint of urinary leakage in association with coughing, sneezing or physical exertion, whereas Urgency Incontinence is the complaint of urinary leakage associated with a sudden compelling desire to void that is difficult to defer. These two subtypes are so common that they coexist, as a combination of symptoms termed mixed incontinence.[5] UI occurs in both genders, but prevalence is more in women with 77%. [4] Prevalence is more in antenatal women multipara women 53.4% than in primipara 43.7%.

CAUSES AND RISK FACTORES OF UI

- Age greater than 40 years;
- multiparity;
- postmenopausal status;
- body mass index more than 25;
- history of diabetes and asthma; and
- habit of taking tea, tobacco, pan, and betel[2]

AIMS AND OBJECTIVES

Aims: As both the treatment techniques have been studied separately but there is less number of studies which has compared both the techniques. Easy, efficient, comprehensive, comfortable, convenient exercises require to be promoted for the betterment of post-partum women. Thus, information obtained from this study would be beneficial to women with postpartum Stress Urinary Incontinence (SUI).

Objectives:

- 1) To evaluate the effects of Pilates and Pelvic floor muscle strengthening exercise in females with stress urinary incontinence.
- 2) To compare the effect of Pilates versus Pelvic floor muscle strengthening exercise in females with stress urinary incontinence.

METHODOLOGY

STUDY DESIGN: A Randomized control trial

SAMPLING METHOD: Simple random sampling

Inclusion Criteria

1. Normal post partum mother aged > 18 years.
2. After 4 weeks of delivery patient suffering from stress urinary incontinence.
3. Both prima gravida and multi gravida.

Exclusion Criteria

1. Patient with age above 35 years.
2. Patients with history of Neurogenic Bladder, Tumors of the Bladder, Genital prolapse and any medical condition making it impossible to perform interventions.
3. Patient with previous history of C-section.

Then all the participants were divided into two groups (group A Pelvic floor muscle strengthening exercise (N-45) and group B Pilates (N- 45). Before performing the exercises, the subjects were asked to do breathing exercise as warm up.

Group A: Pelvic Floor Muscle Strengthening Exercise

The participants in Group A had received pelvic floor muscle strengthening exercise in the form of Kegel's exercise and Behavioural Therapy for 30minutes, 4 days a week for 6 weeks given.

Technique of Kegel's exercise:

Initially in semi fowlers position the participants are being asked a to consciously contract their pelvic floor muscles as holding urine to prevent leakage then in progression participant asked to perform same technique in sitting or standing position or while and during activities which can increase intraabdominal pressure.[5,8]

Group B: Pilates training

For Group B had received Pilates training for 30 minutes, 4 days a week for 6 weeks.

Pilates exercise contains. [7,8]:

EXERCISE	DESCRIPTION
Pilates breathing	Breathe slowly and concentrate on diaphragm movement. As air is exhaled, with pursed lips, perform isometrics in the "power house".
Butter fly or hip Opening	In long sitting position gradually bend the legs as heel facing each other and band as much as stretch you can tolerate.
Pelvic tilt	In crotch lying position tilt the pelvis in clock and anti clock direction. (progression in standing)
Shoulder bridge	In crotch lying position the movement is initiated by the activation of the power house, followed by gluteal contraction, retroversion of the pelvis and lifting of the pelvis(hold if you can up to 3 to 5 sec) then return to starting position.
Wall squat	In standing with back supported on wall, keep one feet distance between two feet then squat down as much as you can with contraction of "Power house" muscles.

Modified Oxford Scale (MOS) for pelvic floor strength and the quality of life was assessed using King's Health Questionnaire (KHQ) as an outcome measures. After 6 weeks again the strength and quality of life was assessed, then the effect of Pilates training and conventional training were compared. The King's health questionnaire is a valid instrument for measuring the quality of life of patients with different types of urinary incontinency. The internal consistency of dimensions was good (0.65-0.92) as was test-retest reliability (0.68-0.88). Both outcome measures were taken pre and post intervention in both the group.

STATISTICAL ANALYSIS

Descriptive analysis was used for characteristics of patients and to calculate frequency and distribution of patient. Paired-t test was used to find out significant difference in improvement between pre and post score of MOS and KHQ within the groups. Unpaired-t test will be used to compare the treatment between both the groups. Probability values less than 0.05 were considered statistically significant. (p<0.05)

RESULT

Table 1: Comparison of mean of Modified Oxford scale score within Group A and Group B

	Means \pm SD		"t" value	'p' value
	Pre	Post		
Group A	2.10 \pm 0.30	3.00 \pm 0.40	9.424	0.0001*
Group B	2.20 \pm 0.50	2.99 \pm 0.58	8.232	0.0001*

p< 0.05 statistically significant. ;*highly significant

Group-A and B shows significant improvement in pre intervention score of modified oxford scale in compare to post 6 weeks(P value <0.0001)

Table 2: Comparison of mean of King's health questionnaire score within Group A and Group B

	Means \pm SD		"t" value	'p' value
	Pre	Post		
Group A	58 \pm 2.30	40.00 \pm 3.33	10.321	0.0001*
Group B	56 \pm 2.50	39.00 \pm 2.08	9.578	0.0001*

Group-A and B shows significant difference in pre intervention score of King's health Questionnaire in compare to post 6 weeks. (P value <0.0001)

Table 3: Comparison of mean of both the outcome measure score between the both Groups

	Means \pm SD(post intervention)		"t" value	'p' value
	Group A	Group B		
MOS	3.00 \pm 0.40	2.99 \pm 0.58	2.009	0.0001*
KHQ	40.00 \pm 3.33	39.00 \pm 2.08	3.786	0.0001*

Table 3 shows that there was no significant difference between both the group over MOS and KHQ post 6 week of intervention. (p-value<0.0001)

DISCUSSION

Participants of pelvic floor muscle strengthening group shown improvement in muscle strength and quality of life over King's health questionnaire after 6 weeks of treatment within the group. When compared to Pilates training, group A (pelvic floor muscle strengthening) shown slightly greater improvement in both the outcome measures.

While comparing demographic data at baseline it was found that mean age of female having stress urinary incontinence in group A was 36 years and in group B was 38 years. This result was consistent with study done by Uma Singh et al that the prevalence of urinary incontinence ranged from 27.8% to 42.8% (moderate). In women above 30 years of age and prevalence is significantly higher among women above 40 years of age. Mode of vaginal delivery had a significant impact on prevalence of overall

and stress incontinence, prevalence being higher in women having even one vaginal delivery.[2]

Kegel exercises are the most popular method of reinforcing pelvic floor muscles strength and are non-invasive treatment such that they do not involve the placement of any vaginal weights/cones. Researches shows that Kegel exercises steadily strengthen the pelvic floor muscles. However, in practice the results of patients vary depending on whether they exercise their pelvic floor muscles.[1]

A study by Arnold Kegel states that pelvic floor muscles exercises have been recommended to compensate for pelvic floor dysfunction and limit prolapsed and urinary incontinence. The study focused on clinical effects achieved this intervention has a role in increased pelvic floor muscle strength, improved quality of life and reduced frequency of urinary incontinence.[9]

Behavioral treatments improve bladder control by changing the incontinent patient's behavior, particularly his or her voiding habits, and by teaching skills for preventing urine loss. These treatments are successful for most outpatient men and women with stress, urge, or mixed incontinence. Various studies revealed that Behavioral treatment along with Kegel's exercise is a safe and effective conservative intervention in urinary incontinence (Burgio et al., 2000). [6]

According to Pilates principles like centering, precision, concentration, breathing it basically acted on each and every body part of the participants like physical as well as psychological. It had shown highly significant changes in concentration, negative affect and behavioral change. As one of the principles is concentration naturally the participants were concentrating on exercise session fully. So Pilates helped them to get deviated from their pain, depression and suffering and engaged them in learning some new technique of exercise. [1]

A comparative study by Pournima Pawar et al. on mat based pilates exercises and conventional exercises on core muscle strength in postnatal women supported our study by stating that the 3 weeks of Pilates Training was more effective than the conventional exercises to improve the core muscle strength. Pilates helps in learning how to properly engage all of the core muscles to stabilize and protect the lumbopelvic area with everyday activities and exercise.

Present study showed extremely significant improvement in Quality of Life and increase in the Pelvic floor strength after getting treatment for 6 weeks of treatment in both the Groups. Significant improvement was also seen in the both the groups but the effect was seen more in pelvic floor muscle strengthening group.

CONCLUSION

The present study showed that pelvic floor muscle strengthening and pilates exercise both are equally effective treatment for conservative management of women having stress urinary incontinence. Furthermore, Pilates method can be used for treatment option for stress urinary incontinence as it showed same effects as PFM strengthening.

Declaration by Authors

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