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Effectiveness of Pelvic Floor Exercises for Stress Urinary Incontinence among the Postpartum Women

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ABSTRACT

Urinary incontinence is a socially embarrassing condition for a woman, leading to gradual withdrawal from society and decreased quality of life. This withdrawal may have impact on women's health. Regular moderate physical activity is important in prevention of osteoporosis, obesity, diabetes, high blood pressure, coronary heart disease, and depression. The aim of the present study was to investigate the impact of 4 weeks pelvic floor muscle training program on the severity of leakage, improvement in the pelvic floor muscle strength and quality of life among the postnatal mothers suffering from genuine stress incontinence. A Quasi experimental design was followed in this current study, where 20 women subjects were selected by lottery method. The subjects who had urodynamically proven Genuine Stress Incontinence for more than 3 months after delivery (3 to 24 months) were only chosen for this study. The study consists of 1st day pre-test and post-test after 4 weeks. The subjects were treated by physiotherapist individually with pelvic floor muscle exercise of both phasic and tonic contractions along with Knack maneuver. At the end, the patients were subjected to the test for severity of leakage, pelvic floor muscle strength and quality of life. The results of the present study showed that 4 weeks of pelvic floor muscle exercises are effective in decreasing postpartum urinary incontinence.With the search for low-cost,simple and easily administered treatments, this study contributes to the development of treatment protocols which are effective and with less expense for the public health system.

Keywords: *Stress urinary incontinence, Postpartum, Pelvic floor muscle exercise, Physiotherapy,*

INTRODUCTION

Urinary incontinence is defined as "involuntary loss of urine which is objectively a demonstrable, social, and hygienic problem"[1]. The urinary incontinence was broadly divided into three major types, which includes stress, urge and mixed[2]. Stress urinary incontinence (SUI) is the involuntary leakage of urine during exertion or sneezing or coughing. The intra-abdominal pressure is raised during the exertion and this elevated pressure cannot be resisted by the urethral sphincter, thus leads to urine leakage during day-today activities such as laughing, jumping, lifting, sneezing, etc., in the stress urinary incontinence[3, 4]. Urge urinary incontinence (UUI) is the involuntary leakage of urine preceding the urgency. UUI associates with the overactive bladder syndrome where the urinary bladder contracts abnormally that creates a sensation to urinate and which eventually becomes stronger and ultimately leads to leakage of urine[5]. The third type of urinary incontinence, mixed urinary incontinence (MUI)associates with both the stress and urge type, where leakage occurs both upon exertion, sneezing or coughing[6].

Genuine stress urinary (GSI) incontinence is a significant urological condition in female, affecting psychosocial welfare, interpersonal relationships, quality of life and general health[7]. Numerous factors are

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involved in the etiology of GSI, including pregnancy, childbirth, and aging[8].A total of 78% of all female urinary stress incontinence is related to maternity, with 64% reporting an onset during pregnancy and a further 14% reporting an onset during postpartum. In order to reduce the effects of SUI, pelvic floor muscle exercise (PFME) was shown to be an effective treatment during pregnancy and postnatally without any significant adverse effects[9]. The present work aims to study the effectiveness of PFME on the severity of leakage, improvement in the pelvic floor muscle strength and quality of life among the postnatal mothers suffering from genuine stress incontinence.

MATERIALS AND METHOD

20 females with urodynamically proven GSI persisting more than 3 months after delivery (range- 3 to 24 months) were chosen as subjects for this study. This study was performed in the Physiotherapy Department, Vinayaka Mission University, Salem, during the period January 2007-October 2007.The ethical approval for this study was obtained from the institutional review committee. Demographic variables like age,BMI were taken.The following inclusion criteria were followed during the selection of subjects: women aged over 18 years,who complained of urinary leakage on stress and willing to participate in the study. The following exclusion criteria were also followed: pelvic organ prolapse, low back pain, spinal or pelvic fracture, urinary tract infection, vaginal infection, neurological disorders, respiratory diseases, uncontrolled hypertension,latex allergies,menstruation at the time of assessment, history of spinal surgery,inability to carry out evaluation or treatment, or history of PFM training during physiotherapy within the last two years.Informed verbal and written consent was obtained for further study from the participants.

The following variables were considered in the study-independent variable: Pelvic floor exercise, dependent variable: Severity of leakage, Pelvic floor muscle strength and Quality of life. The severity of leakage measured using visual analogue scale (VAS), where the patients were asked to grade the severity of their urinary loss using VAS of 0–10 (a higher score indicates greater symptom severity), pelvic floor muscle strength was measured using functional stop test (0-3 grades, where grade 0:inability to deflect the flow of urine, grade 1-partial deflection that can't be maintained, grade 2-maintenance of partial deflection, grade 3-complete stop of the urine), quality of life was measured using King's health questionnaire (KHQ). KHQ is a patient self-administered self-report and has 3 parts consisting of 21 items. Part 1 contains general health perception and incontinence impact (one item each). Part 2 contains role limitations, physical limitations, social limitations (two items each), personal relationships, emotions (three items each) and sleep/energy (two items), severity measures (four items). Part 3 is considered as a single item and contains ten responses in relation to frequency, nocturia, urgency, urge, stress, intercourse incontinence, nocturnal enuresis, infections, pain, and difficulty in voiding. The responses in KHQ have four point rating system. The eight subscales ("domains") scored between 0 (best) and 100 (worst). The Symptom Severity scale is scored from 0 (best) to 30 (worst). Decreases in KHQ domain scores indicate an improvement in quality of life. The minimally important difference - the smallest change in score that subjects perceive as beneficial is 3 points for the symptom severity scale and 5 points for all other KHQ domains. It is interesting to note that lower scores indicate patient wellbeing and higher scores mean that the person is severely affected by the disease condition.

The pelvic floor exercises regimen was carried out as outpatient activities under the supervision of the same physiotherapist that carried out the evaluation.Patients were given oriented to education on the anatomy and function of pelvic floor muscle using diagrams and models before embarking on teaching pelvic floor muscle exercises. As pelvic floor is entirely composed of striated muscle,the principles of strength training were followed when attempting to teach PFMEs for the patients. The patients were asked to do three sets of eight to twelve contractions sustained for 3 seconds each with 6 seconds of rest, and followed by tonic contractions for 5-10seconds with 10-15 sec of rest performed three to four times per 1 hour session daily for four weeks. PFME was taught in sitting,with a neutral lumbar spine and forearms resting on knees thereby stimulating the dermatome of S4.The proper contractions were confirmed by vaginal palpation.Exercise program was also accompanied by instruction of the "Knack" or counterbracing technique to prevent leakage during increases in abdominal pressure. The patient was taught to contract the pelvic floor muscle just prior to physical stresses such as sneezing,lifting,coughing or

laughing. As knack technique is a learned reflex activity the patient was advised to do it as often as possible at home.Patients were asked to keep track of each home practice in a daily diary. There were no complaints of adverse effects due to treatment from the patients.

STATISTICAL ANALYSIS

Statistical test was conducted using software SPSS version 16. Nonparametric test statistics of Wilcoxon Signed rank test for comparing the two scores was done.

RESULTS

Genuine stress urinary incontinence (GSUI) is a condition which affects the interpersonal relationships, psychosocial welfare, productivity, general health and ultimately the quality of life among women. It is one of the common problems faced by the middle age women[10].The present study aims to assess the effectiveness of pelvic floor muscle exercises on postpartum women suffering with genuine stress incontinence.The total number of subjects involved in this study was20 females, whose age was ranging from 25 to 35 years. The study consists of 1st day pre-test and post-test after 4 weeks of PFME. First, the effectiveness of pelvic floor muscle exercises on the severity of leakage was observed by analysing the data obtained from 20 subjects through visual analogue scale (VAS). The mean VAS pre-test was found to be 6.280, and VAS post-test was found to be 3.585 (table 1).The results of the VAS test showed that the post-test to pre-test was found to be significant ($p<0.001$), which implies that the PFME has a significant role in reducing the severity of leakage.

Table 1: Comparison of VAS Pre-test & Post-test of pain by Wilcoxon signed rank test.

	N	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
VAS-PRE	20	6.280	1.6482	5.000	6.000	7.825
VAS-POST	20	3.585	1.9821	2.000	3.000	4.750

Secondly, to assess the effectiveness of pelvic floor muscle strength, functional stop test was performed, wherein the grading system of 0 to 3 was employed. The results of the functional stop test showed that the mean stop-pre was 1.20 and for the stop-post was 1.90 (table1) The results of the functional stop test showed that pelvic floor muscle strength was increased significantly ($p<0.001$), which confirmed the effectiveness of pelvic floor muscle exercises to improve the pelvic floor muscle strength in the genuine stress urinary incontinence subjects.

Table 2: Comparison of Pre-test & Post-test functional stop test by Wilcoxon signed rank test

	N	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
STOP-PRE	20	1.200	.4104	1.000	1.000	1.000
STOP-POST	20	1.900	.3078	2.000	2.000	2.000

Finally, to assess the quality of life in the genuine stress urinary incontinence subjects, King's health questionnaire (KHQ) test was performed. In the KHQ test the subjects were given questionnaire, which consist of 3 parts of questions and based upon the feedback from the subjects, the quality of life was determined. The quality of life was determined both before the course of PFME and after the completion of 4 weeks PFME. In the KHQ test, higher final score implies the poor quality of life and lower score implies good quality of life. The results of the present study shows that the mean value for King's pre-test was 74.90, which significantly ($p< 0.001$) reduced to 53.30,(table 3) which clearly showed that the quality of life is improved after undergoing the PFME course for 4 weeks.

Table 3: Comparison of Pre-test & Post-test quality of life by Wilcoxon signed rank test

	N	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
Kings-pre	20	74.900	3.3388	72.000	75.000	77.750
Kings-post	20	53.300	11.0981	46.250	49.000	56.000

DISCUSSION

The results of the present study demonstrated that 4 week pelvic floor muscle exercise course was found to be effective in treating the genuine stress urinary incontinenceamong the postnatal mothers.It has decreased the leakage, improvedthe pelvic floor muscle strength and quality of life.The pelvic floor provides hammock-like support at the base of the pelvis and helps maintain urinary and faecal continence. 12 Muscles of the pelvic floor arranged in 3 layers are vital in maintaining continence as they supply an occlusive force to the urethral wall during increased abdominal pressure. Pelvic floor muscles contract as a whole moving the pelvic girdle in one direction. Voluntary contraction of the pelvic floor muscles are best described as an inward lift and squeeze around the urethra, vagina and rectum. Prevalence of stress urinary incontinence during pregnancy vary between 6% and 67%, and from 3% to 38% two to three months after delivery.[11]

The results of the main effects of the intervention show that the Pelvic floor muscle exercises regimen that was followed in this study targeting power, strength and endurance of the muscles were effective in reducing the severity of incontinence , improving the strength and quality of life.A combination of fast and slow exercises that was included may also have contributed for the improvement. The knack technique helps the women to pre-contract the pelvic floor muscles before and during efforts when intra-abdominal pressure increases. This is thought to stabilize the bladder neck during increased abdominal pressure such as coughing, which prevents urinary leakage. Study shows that knack manoeuvre can reduce urinary leakage by 98.2% with a medium cough, and 73.3% with a deep cough, after only one week of training.[12]Pelvic floor muscle exercises strengthen long-lasting structural support of the pelvis by rising the levator plate to a higher location in the pelvis and by enhancing hyper-trophy and stiffness of the pelvic floor muscle and connective tissues.Studies show that pelvic floor muscle exercises could prevent perineal descent during increased intra-abdominal pressure and facilitate automatic motor unit firing[13,14,15.] The types of exercise, frequency and intensity, and the duration of the trainingperiod in addition to adherence to the training protocol are of primary importance for reducing stress incontinence.

CONCLUSIONS

In terms of the effectiveness of PFME programs, the results of this study indicate that urinary incontinence following childbirth can be improved by performing pelvic floor muscle exercises.

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