

## Role of postpartum Kegel exercises in the prevention and cure of stress incontinence

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### ABSTRACT

**Background:** Urinary incontinence in the post partum is a significant health problem in women with serious physical, psychological, and social consequences. The objective of this article is to educate women the correct method to do Kegel exercises, to assess their improvement and to introduce Kegel exercise regimen in every women in the postpartum period.

**Methods:** 72 women in postpartum period with genuine stress incontinence (GSI) included in the study from January 2012 to July 2014 in the department of Obstetrics and Gynecology of VCSGGMSRI Srinagar, Pauri Garhwal, India. Women divided into 2 groups, first group of supervised Kegel exercises and second group was of women doing pelvic floor exercises at home. To monitor improvement, monthly assessment of pelvic floor function (vaginal palpation and observation) and measurement of PFM strength (vaginal squeeze pressure) by physician and patient both, done in the 2 groups.

**Results:** The women were in the age group of 18-39 years. There were 15 % patients in dry category, 52 % had good improvement and 21 % had fair results. In the supervised exercise group the patients with good clinical response were 80% in the cured and borderline responder category. In the non-supervised group patients in the cured and borderline responders group were (6) 16% and (12) 33% respectively.

**Conclusions:** The high cure rate depends on the factors like how correctly the Kegel exercises were instructed, how correctly the patients learned and performed them.

**Keywords:** Kegel exercise, Leakage index, Pelvic floor muscles, Postpartum stress incontinence, Social activity index

### INTRODUCTION

Pelvic floor muscle training (PFMT) for the management of urinary incontinence has been mentioned in several ancient texts. The Chinese “Deer Exercises” were used over 6000 years. The rich heritage of Indian Yoga describes similar exercises as part of the Ashwini Mudra (“horse gesture”), practiced by the Yogis. Urinary incontinence is recognized as a significant health problem with serious physical, psychological, and social

consequences. Arnold Kegel first described pelvic floor exercises (Kegel exercises) as a treatment method in 1948.<sup>1,2</sup> Regular Kegel exercises strengthen the pelvic floor muscles to a great extent and benefit women with stress incontinence (especially in peri and postmenopausal women) and are essential to get the body back into shape after childbirth. Kegels also improve circulation in the rectal and vaginal area, speeding recovery after an episiotomy or tear during childbirth. We studied the role of Kegels in patients of stress urinary incontinence in supervised and home groups.

## METHODS

A prospective Study was carried out in the department of Obstetrics and Gynecology VCSGGMSRI Srinagar, Pauri Garhwal, India from January 2010 to July 2012. It included 72 women with persistent genuine stress incontinence (GSI) 3 months after normal delivery. The selection criteria in the study were urinary incontinence, no gynaecological abnormality, no neurological or psychiatric illness, demonstration of leakage and positive pad test. The exclusion criteria were GSI before pregnancy, neurological or psychiatric illness, moderate to severe prolapse (Pelvic Organ Prolapse Quantification (POPQ) Stage II or more), overactive detrusor and previous surgery for GSI. A positive pad test means a urine loss of 5ml or more after a protocol of provocative test for 1 hour. All the patients had a stable bladder, a positive maximum urethral closure pressure of less than 40 cm H<sub>2</sub>O.

The women were divided into 2 groups of 36 each. First group performed supervised Kegel exercises and second group was advised to do pelvic floor exercises at home. The institution adhered to the basic principles of the Declaration of Helsinki of the World Medical Association. As human participants were involved, a statement of approval by institutional review board (IRB) and the participant's informed consent had been taken.

The women in the supervised group were called every week. The exercise was supervised by an instructor for 45 minutes and for rest of the days they were advised to do the exercises at home. They were instructed to do close to maximum contractions, with legs apart, with firm verbal commands to hold the contractions for 6-8 seconds and then doing 3-4 fast contractions over each sustained holding time. The supervised group included patients who resided in a 25 km radius, to facilitate weekly visits. The home exercise group women were instructed to do 8-12 contractions a day as hard as possible, recording the contractions in a training diary. The women in home exercise group were called for follow up at an interval of 4 weeks. To monitor improvement, monthly assessment of pelvic floor function was done by vaginal palpation. Observation and measurement of PFM strength was calculated by vaginal squeeze pressure. Monitoring, observation and measurement were performed by physician and patient both. The patients were assessed every month till 6 months.

All the patients were taught the correct technique of Kegel exercises which included squeezing PFM for a few seconds, and then relaxing. Feeling a pull indicated that the correct muscles were being used. Steps of practicing Kegel exercises were (1) Identification of the muscles. (2) Contracting the muscles correctly. (3) Fast and slow contractions. The slow contractions of Kegel exercises help to increase the strength of the pelvic floor. These were: (1) Lifting the pelvic floor muscles for 10 seconds. (2) Holding the muscles tight while counting up to ten.

(3) Concentrating on lifting the muscles and holding the contraction for as long as possible. (4) Gradually increasing the time up to 10 seconds. (5) Relaxation of the pelvic floor muscles and rest for 10 seconds. (6) Repeating the contractions 10 times.

The fast contractions help the pelvic floor to cope with conditions of increased intra-abdominal pressure e. g. during sneezing, coughing and laughing. These work on the muscles that quickly control the flow of urine. (1) Lifting the pelvic floor muscles quickly. (2) Holding the contraction for one second. (3) Relaxing the muscles and rest for one second. (4) Repeating the contractions 10 times.

The patients were asked to focus on the pelvic floor muscles and not on other muscles (for example, stomach or legs). They were asked to breathe continuously during exercises, so that the body and muscles receive oxygen throughout. Exercises were not to be performed while actually going for urination, to avoid incomplete emptying of the bladder and risk of urinary tract infections.

The patients were evaluated after 12 months of treatment as

1. *Dry*: Cured in patient's assessment, no episode of incontinence for 6 months and evidence of pelvic floor function.
2. *Good*: Patient satisfied, occasional episodes of incontinence during 6 months and evidence of pelvic floor function.
3. *Fair*: Patient satisfied some improvement in symptoms and no evidence of pelvic floor function.

We used the scoring system which combined the objective and subjective criteria. The 5 criteria, each having a score of one are (1) Cured / Almost cured: It's a subjective finding by the women themselves. (2) Conversion of a negative to positive closure pressure on coughing. (3) Improvement measured by the pad test. (4) Improvement measured by the leakage test. (5) Improvement measured by the social activity index.<sup>3</sup>

*Pad test*: A sanitary napkin was weighed and then worn for 20-60 minutes, during which time the individual was asked to perform certain activities like walking briskly for 3 minutes, sitting and then standing 10-20 times, walking up and down stairs for 1-2 minutes, picking up objects from the floor 5-10 times, coughing 12 times and/or running in place for one minute. The pad was then removed and weighed again to calculate the amount of urine voided. The leakage index developed by Bo, a tool designed to evaluate a woman's perceived stress incontinence, consists of a 5-point scale (1="never," 5="always") used to evaluate 13 types of physical activity known to trigger urine leakage.<sup>4</sup> Improvement was also assessed by social activity index. The problems perceived while participating in nine different social

settings were recorded on a 10 cm visual analogue scale (0 impossible to participate, 10 no problem taking part). The pelvic floor muscle strength was assessed by vaginal palpation by 2-fingers, and contractions were graded as 0 ("none"), 1 ("weak"= $\leq 1$  second), 2 ("moderate"=1–5 seconds), or 3 ("strong"= $\geq 5$  seconds).<sup>5</sup> A score of 4-5 means cured; 2-3 means borderline responders, 1-0 are non responders. The pelvic floor muscle function was calculated as mean  $\pm$  standard deviation of the digital palpation scoring.

## RESULTS

The women were in the age group of 18-39 years. Most were in the age group of 18-29 years (Table 1). The mean height was 155 cm and mean weight was 58 kg. The mean BMI was 20-25. All the women had vaginal delivery. The study included 26 nulliparae and 46 multiparae. Among the multiparae the average parity was 2 and the maximum parity was 5. There were 15 % patients in dry category, 52 % had good improvement and 21 % had fair results in the supervised group. The patients in the non supervised group there were 8% patients in the dry, 37% had good improvement and 43% patients had fair results. We found that in 88% patients in the supervised group the compliance and attendance in the hospital was more than 90%. However in the home group 90% patients were saying they were doing it regularly. In the supervised group 12% patients were not compliant and their attendance was below 90%.

**Table 1: Distribution of women in different age groups.**

Age distribution (In years)	No. of patients in supervised and non-supervised group
18-23	30
24-29	18
30-35	14
36-39	10
Total	72

**Table 2: Response of patients in the two groups.**

Treatment response	Scores	Supervised group		Non-supervised group	
		No of Patients	(%)	No of Patients	(%)
Cured	4-5	12	33.33	6	16.67
Borderline responders	2-3	17	47.22	12	33.33
Non responders	1-0	7	19.45	18	50

In the supervised exercise group at 6 months the patients with good clinical response were 80% in the cured and borderline responder category. In the non-supervised group at 6 months patients in the cured and borderline responders group were 6 (16%) and 12 (33%)

respectively. Supervised group had 7 (19 %) patients and non-supervised group had 18 (50%) patients in the non-responders group (Table 2).

In the supervised group average pad test was 24.5 which after 6 months were 5.6 while in home group initially it was 25.5 improving a modest to 14.2. The average leakage index in the supervised group before study was 3 which after training became 1.7 and in the home group it changed from an average of 2.9 to 2.4. The average social activity index before the supervised training was 8.8 and with training it became 9.2, however in the home group the average showed marginal improvement from 8.6 to 8.8. The pelvic floor muscle function in the supervised group improved from  $1.2 \pm 0.6$  (mean  $\pm$  standard deviation) to  $2.1 \pm 0.8$  and in the home group it became better from  $1.2 \pm 0.6$  to  $1.8 \pm 0.4$  (Table 3).

**Table 3: Outcome variable before study and at 6 months of training in Supervised and home group.**

Outcome variables	Group of Patients			
	Supervised		Non-supervised (home group)	
	Before study	After study at 6 months	Before study	After study at 6 months
Pad Test	24.5 (17.8, 31.2)	5.6 (2.8, 8.8)	25.5 (18.2, 32.8)	14.2 (12.1, 16.3)
Leakage Index	3.0 (2.4, 3.6)	1.7 (1.4, 2.0)	2.9 (2.1, 5.8)	2.4 (1.8, 3.0)
Social activity index	8.8 (7.8, 9.8)	9.2 (8.9, 9.5)	8.6 (7.1, 10.1)	8.8 (7.4, 10.2)
Pelvic floor muscle strength calculated by vaginal palpation (Mean $\pm$ SD )				
	$1.2 \pm 0.6$	$2.1 \pm 0.8$	$1.2 \pm 0.6$	$1.8 \pm 0.4$

SD: Standard deviation

## DISCUSSION

In our study cure rate was 33% in supervised exercise group and 16% in non-supervised home exercise group as compared to 32% in study of Benvenuti et al.<sup>6</sup> However Kegel reported a high 84% rate but the details of exercise groups was not mentioned in the study. We recommended 8-12 contractions daily as advised by Bo et al.<sup>7,8</sup> The design of PFM training requires individualisation in each patient.<sup>9</sup> In our study patients showed improvements in their symptoms in both groups as compared to an 8 weeks trial of PFM training which significantly increased PFM strength, improved quality of life, and reduced the frequency of UI episodes.<sup>10</sup> Our study showed significant improvement in pelvic floor function in both groups as compared to the

multidimensional training which significantly improved PFM function.<sup>11</sup> We noticed that the symptomatic women had altered pelvic floor muscle activation as shown in the study with altered muscle activation patterns in symptomatic women during pelvic floor muscle contraction and Valsalva manoeuvre.<sup>12</sup> The submaximal voluntary control exercises designed for GSI shown to strengthen PFM also.<sup>13</sup> The favourable response to PFM training indicates that the improvement persists for a long time as reported in a study that there is a 66% chance that the favourable results will persist for at least 10 years.<sup>14</sup> The increase in strength of PFM can be confirmed by vaginal and anal surface electromyograms and urethral and vaginal squeeze pressure measurements.<sup>15</sup>

Behavioural treatment options concentrate on traditional physical therapy techniques of education, therapeutic exercise, and the use of physical modalities that aid in the restoration of muscle function.<sup>16</sup> In patients having GSI there are two groups of patients, one who can voluntarily contract the PFM and others cannot contract at all as observed in our study also.<sup>17</sup> Our data showed 80% good clinical response in the cured and borderline responder category in the supervised exercise group at 6 months while in the non-supervised group at 6 months it was 49% which was comparable to majority of studies in which success rate was 42-78%.<sup>18,19</sup>

In the postpartum period patients were not concerned about the urinary incontinence unless it's not hampering their social life very significantly. The drawback of the study is less number of patients and lack of control group. Moreover in the non-supervised group, we cannot predict how well and how correct was the method of exercise regime employed at home due to subjective variation in intelligence, home atmosphere and commitment. This study does not have very definitive outcome variables and they are more of subjective nature. The main problem with the follow up criteria in the study was that there was no clear distinction between cure of symptoms and improvement. However, in the study all efforts have been taken to highlight the importance of the PFM exercises in urinary incontinence. Kegels are easy and can be done at any time like sitting in the car, at the office desk or standing in a queue without being noticed by others. The exercises are to be continued for rest of the life. It takes about fifteen weeks of regular exercise for result to be appreciable. If there is no improvement in urinary incontinence after three months of exercise regime, the problem and the methodology has to be reviewed and reassessed. This is a non-invasive way of treatment, which is very beneficial and cost effective. Exercises for the pelvic floor should be part of every woman's fitness regime. Health care providers, health educators, and fitness personnel need to ask women more questions about pelvic floor function, encourage women to exercise these muscles, and to seek medical care for their dysfunctions. Only then will the magnitude and prevalence of pelvic floor muscle dysfunctions receive the attention it need.

## CONCLUSIONS

High cure rate depends on the factors like how correctly the Kegel exercises were instructed, how correctly the patients learnt and performed them. For good clinical results the exercises have to be performed for 5-6 months. Well conducted follow up and good compliance from patient is mandatory. More studies have to be done in this field to find reliable outcome variables and to determine the effectiveness of different physiotherapy protocols. Determination and active participation of patient is the key to success. Patients should be motivated to exercise in groups to increase compliance.

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