

Original article:

Perineometer as a strength assessment & training tool for pelvic floor muscles in stress urinary incontinent elderly women

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Abstract:

Stress urinary incontinence defined by the involuntary loss of urine, it is a socially hygienic problem & is objectively demonstrable –International Continence Society. Prevalence rate of SUI ranges from 75- 80 %. Recommended Physical Therapy Management is least invasive and only method without undesirable side effects; apart from classical Kegel's exercises, multiple training options are being followed. Interventional studies have been done with females aged 60-74 yrs & used the QUID questionnaire for choosing the type of incontinence. Perineometer is a valid strength assessment device in a comparative study for digital palpation by OXFORD scale. This study demonstrates the use of perineometer as a strength assessment & endurance training device for stress incontinence.

Key words: pelvic floor muscle strength, stress urinary incontinence, elderly, Perineometer

Introduction

Stress Urinary Incontinence has been one of the most prime overlooked causes of maternal depression.⁽¹⁾ studies have shown, that the incidence of SUI after caesarean delivery was significantly lower than that after normal vaginal delivery ⁽²⁾⁽³⁾.

The other impending risk factors predisposing stress incontinence are associated with increasing age, increased vaginal deliveries, obesity & a protuberant stomach, abdominal surgeries, chronic respiratory condition & recurrent urinary tract infections⁽³⁾Physical therapy is now recommended as first-line treatment for UI. It is minimally invasive, has a low rate of side effects and low costs.

Perineometry is a valid strength training device which measures accurate results for strength of pelvic floor muscles and also can be used as an assistive device for improving pelvic floor muscle strength

^{(3),(4)}. There is no standard recommendation for the measurements obtained through the perineometre, when assessing the strength of a pelvic floor contraction. It measures strength and progress of the pelvic floor muscles.

Methods & materials:

A longitudinal study design was undertaken between April2015-Dec2015. The study commenced after the approval of the ethical committee of the institution. 80 stress incontinent elderly women were selected randomly from geriatric home care of age 55-70yrs from the rural area(sample size was calculated from www.openepi.com, with a CI of 95%) ⁽¹⁴⁾. Stress incontinence was quantified on the basis of a valid QUID (Questionnaire for urinary Incontinence Diagnosis) ⁽¹³⁾ tool, which confirmed the stress incontinence. BIONICS Perineometer was used to pre – asses and post assess the strength & endurance of

Pelvic Floor Muscles. The Inclusion Criteria was women up to Age 55 yrs-70 yrs, Females undergone vaginal delivery, Primiparous or multi- parous & Females with complaint of stress incontinence with the score ≥ 4 on the QUID questionnaire (for clinical diagnosis). The Exclusion Criteria was Females with uterine prolapsed, undergone caesarean section delivery, Patients with vaginal or abdominal hysterectomy, presenting with severe medical condition that prevents them to perform exercise like, urinary tract infection or vaginal infections, the QUID questionnaire (for clinical diagnosis) ≥ 6 & Patients who do not understand the commands. The participants signed a duly informed consent of the effects of training with the perineometer and that there was no potential harm in using it. The Baseline measurements and after the perineometer training measurements of pelvic floor muscle strength were taken using perineometer it self. The device used here was the BIONICS Pelvik (the intelligent pelvic floor exerciser) and device specific recommendations of the manufacturer were used.

For the perineometre, the pateint is kept in the gynecological position while a rubber coated,

uninflated transducer covered with a condom is introduced 2-3 cm into the vaginal introitus. Next, the transducer is inflated and the apparatus is set to 0. The pateint is asked to inhale and perform maximum contraction of the pelvic floor muscles while exhaling which would correspond to the readings in the ammetre attached to the transducer.

The measurement is more precise with the larger sensor. Keep the largest sensor that feels comfortable at 0 (do not inflate with the pump) and ask the patient to squeeze as hard as you can. The best measure for progress is the base line measurements taken at the beginning of the treatment. So for example: if at the start your needle started with 5 and now you could move it by 20 units your strength has improved 4 folds. The amount of time you can hold your contractions is your endurance and can be measured by simply adding up the seconds of your contractions i.e., if you do 15 reps of roughly 3 sec each you actually did 45 seconds.

Below is a guide provided by the manufacturer for the device as a rough gauge for measuring the strength and endurance(table 1).

Table :1

Strength	Endurance	
10 or under	45 seconds or under	Weak
10-20	45-90 seconds	Moderate
20-30	90-135	Normal
30-40	135-180	Strong
Over 40	Over 180	Very strong

Participants were asked to contract pelvic floor muscles correctly, with 8-12 high intensity contractions; twice. The rest period was 6 seconds between the contractions. (14)

The measurement will be taken at baseline, 2 month and 4 month and will be analyzed statistically, by calculating Mean, Median and Mode and from that P value and Paired t-test will be calculated to know the use of pelvic floor muscle contractions in reducing the symptoms of Stress Urinary incontinence.

Results: The result was calculated using mean and paired t- test. The pre assessment criteria for selecting the stress incontinent women were the QUID score \geq 4 score for the first three questions of the questionnaire. For each participant, the mean was taken. Initially there were higher scores for the questions answered i.e.; pre- assessment scores for QUID were higher and after strengthening with perineometer, there was significant reduction in the scores of QUID (Graph1)

Also perineometer readings on strength and endurance measured by the perineometer, on the basis of specifications provided by the manufacturer showed significant improvement (Graph 2).

The endurance was measured as weak, moderate and normal. Earlier there were more number of women in the weak category, but after strengthening, there was improvement from weak to moderate and moderate to normal endurance of the pelvic floor muscles. (Graph3).

Discussion:

In the investigation of stress incontinence, the parameters on the QUID questionnaire depicted significant changes. Nevertheless, stress incontinence can be attributed to the fact that Indian women undertake household chores which include sitting/squatting and washing clothes, household

cleaning, an inadequate diet etc, which would have led to stress on the bladder in their lifetime.

Several studies have showed the effect of parity and recurrent vaginal deliveries, contributing to stress incontinence. This study supports the previous work of short term protective effect of cesarean deliveries. (10)

Age dependent changes develop as a result of hormonal changes and musculature weakness of the vaginal muscles adds in to the consequences. Therefore, it is essential to practice vaginal muscle strengthening programs and avoid such penalties.

Perineometer is a valid strength assessment and training device, which has been proved in previous studies of Isherwood & Rane. (11) They showed that perineometric readings of pelvic floor muscles are equally reliable and a dependable method of measuring pelvic floor strength.

Training pelvic floor muscles with perineometer device helps to provide resistance at desirable readings as well as makes it easier for the trainer and the individual to get a feed back. Also it helps to set a further prognosis objective, where the patient/ individual has to or can achieve. The perineometer device is easy to use with no hassle and no totally safe.

In the current study the perineometric readings showed a strong relation between the pre readings and QUID scores. As the strength improved; the QUID scores lowered subsequently.

Conclusion:

In this study, it was concluded that there is improvement in the pelvic floor muscle strength & endurance & stress Incontinency after training with the vaginal Perineometer..

The device gives a feedback of the improvement and can help to see the improvement quantitatively.

	QUID	S.D	Perineometer	S.D
Pre	0.508	0.389	6.037	2.42
Post	2.197	0.171	17.08	3.51

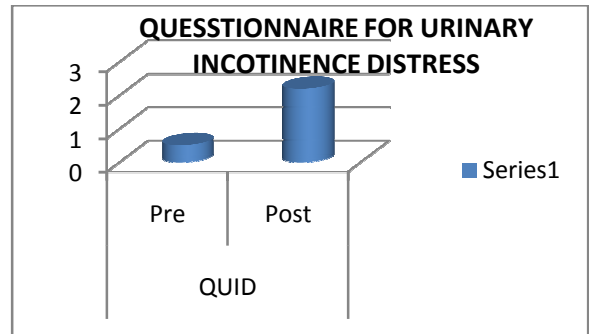
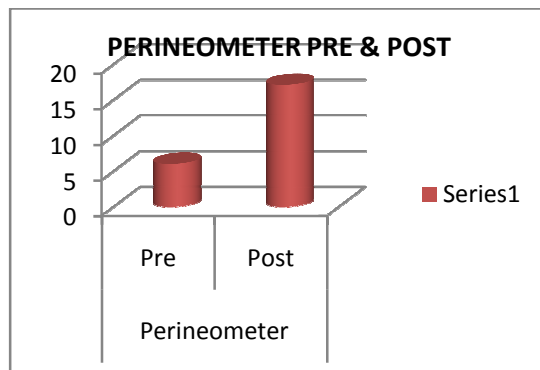


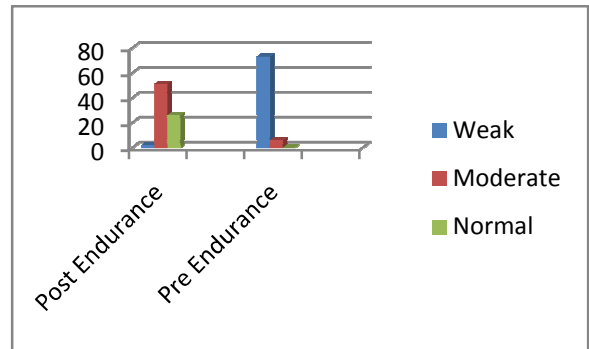
Table 2: pre & post QUID & Perineometer score

Graph 2: Questionnaire for urinary Incontinence Distress



	endurance	endurance	
weak	2	73	± 40.52
Moderate	51	6	± 24.52
Normal	26	0	

Graph 1: Perineometric measurements pre & post assessment



Graph 3: pre & post measurement of Endurance of Pelvic floor muscles

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