



EFFECT OF PELVIC FLOOR MUSCLE EXERCISE ON URINARY INCONTINENCE IN WOMEN – A REVIEW ARTICLE

Pranali Thakkar

(MPT Pediatrics) Assistant Professor At SPB Physiotherapy College, Surat, Gujarat, India.

Sneha Bhalala*

(MPT Pediatrics) Assistant Professor At SPB Physiotherapy College, Surat, Gujarat, India. *Corresponding Author

ABSTRACT **BACKGROUND OF THE STUDY:** Urinary incontinence (UI) is defined as any involuntary loss of urine. It is one of the most common problems of public health in elderly women and Post pregnancy creating a great impact in the quality of life. As a first-choice conservative treatment, pelvic floor muscles Exercise or Training (PFME), first proposed by Kegel, with the goal to increase support of the inferior urinary tract, as well as to decrease chances of urinary incontinence

OBJECTIVE OF THE STUDY: The objective of the present study was to review and discuss the effect of pelvic floor muscle (PFM) Exercise on urinary incontinence in women

METHODOLOGY: We had search articles and abstract which were published from 1995 to 2017. Randomized controlled trials and non-randomized controlled trials, systemic review and comparative studies were included in this review of in relation to urinary incontinence, and/or adherence to a PFME program in antenatal, post-natal, elder women and all type of urinary incontinent women.

RESULT: From 27 relevant research reports in the period of 1995 to 2017 indicated that Pelvic floor muscle exercise significantly reduced the development of urinary continence.

CONCLUSION: Physical exercise, specifically pelvic floor muscle Exercise programmes, has positive effects on urinary incontinence. This type of training has been shown to be an effective program for treating urinary incontinence in women. Further recommendation is to develop standardized Pelvic floor exercise programs.

KEYWORDS : Urinary Incontinence, Pelvic Floor Muscle Exercise, Elder And Pregnant Women

INTRODUCTION

URINARY INCONTINENCE

It is also known as involuntary urination, is any leakage of urine¹. Pregnancy, childbirth, and menopause are major risk factors². It has been identified as an important issue in geriatric health care.³ Factors commonly found to affect the prevalence of urinary incontinence are: age, gender, race and residing in a nursing home.

TYPES OF URINARY INCONTINENCE

FUNCTIONAL INCONTINENCE:

the patient is unable to reach the toilet in time, for such reasons as poor mobility or unfamiliar surroundings.

STRESS INCONTINENCE:

involuntary leakage of urine on effort or exertion, or on sneezing or coughing. This is due to an incompetent sphincter. Stress incontinence may be associated with genitourinary prolapse.

URGE INCONTINENCE:

involuntary urine leakage accompanied by, or immediately preceded by, urgency of micturition. In urge incontinence there is detrusor instability or hyperreflexia leading to involuntary detrusor contraction.

MIXED INCONTINENCE:

involuntary leakage of urine associated with both urgency and exertion, effort, sneezing or coughing.

OVERACTIVE BLADDER SYNDROME:

urgency that occurs with or without urge incontinence and usually with frequency and nocturia. The usual cause of this problem is detrusor overactivity.

OVERFLOW INCONTINENCE:

usually due to chronic bladder outflow obstruction. It can lead to obstructive nephropathy due to back pressure. Overflow incontinence may also be due to a neurogenic bladder.

TRUE INCONTINENCE:

may be due to a fistulous track between the vagina and the ureter, or bladder, or urethra. There is continuous leakage of urine.³

Nocturnal enuresis is episodic UI while asleep. It is normal in young children.

Transient incontinence is a temporary incontinence most often seen in pregnant women when it subsequently resolves after the birth of the

child.⁴

Giggle incontinence: is an involuntary response to laughter. It usually affects children.

Double incontinence: There is also a related condition for defecation known as fecal incontinence. Due to involvement of the same muscle group (levator ani) in bladder and bowel continence, patients with urinary incontinence are more likely to have fecal incontinence in addition.⁵

Coital incontinence (CI) is urinary leakage that occurs during either penetration or orgasm and can occur with a sexual partner or with masturbation. It has been reported to occur in 10% to 24% of sexually active women with pelvic floor disorders.⁶

CAUSES OF URINARY INCONTINENCE

Causes of stress incontinence

- Pregnancy, Childbirth (labor), Menopause - when estrogen levels drop the muscles may get weaker, A hysterectomy - surgical removal of the uterus (womb), Some other surgical procedures, Age, Obesity

Causes of urge incontinence

- Cystitis - inflammation of the lining of the bladder, CNS (central nervous system) problems - examples are multiple sclerosis, stroke, and Parkinson's disease, An enlarged prostate - the bladder may drop, and the urethra could become irritated

Causes of overflow incontinence

- This happens when there is an obstruction or blockage to the bladder. The following may cause an obstruction:
- An enlarged prostate gland, A tumor pressing against the bladder, Urinary stones, Constipation, Urinary incontinence surgery which went too far

Causes of total incontinence

- An anatomical defect the person has had from birth, A spinal cord injury which messes up the nerve signals between the brain and the bladder, A fistula - a tube (channel) develops between the bladder and a nearby area, most typically the vagina

Other causes of urinary incontinence:

- Some medications - especially some diuretics, antihypertensive drugs, sleeping tablets, sedatives, and muscle relaxants, Alcohol, Urinary tract infection⁷

MANAGEMENT/INTERVENTIONS**THE KNACK MANEUVER:**

The Knack maneuver is a voluntary contraction performed in response to a specific situation. Teach a voluntary contraction of the pelvic floor muscles with appropriate timing, for example, just prior to a cough or sneeze. It is a useful strategy in patients with stress urinary incontinence.⁸

MEDICATIONS

A number of medications exist to treat incontinence including: fesoterodine, tolterodine and oxybutynin.⁹ Medications are not recommended for those with stress incontinence and are only recommended in those who have urge incontinence who do not improve with bladder training.¹⁰

SURGERY

Common surgical techniques for stress incontinence include slings, tension-free vaginal tape, and bladder suspension among others.¹¹ Urodynamic testing seems to confirm that surgical restoration of vault prolapse can cure motor urge incontinence.

PHYSIOTHERAPY TREATMENT**PELVIC FLOOR MUSCLE TRAINING**

Patient specific training is necessary to ensure a proper contraction of the pelvic floor muscle group (both the fast and slow-twitch muscle fibers). Also, training must include instruction in volitional contractions before and during an activity that may cause incontinence (coughing, sneezing, and lifting).⁹ Patients are typically recommended to perform the exercises four to five times daily.^{12,13}

A *vaginal cone* (or vaginal weight) is a medical device specifically designed and shaped to exercise pelvic floor muscles in order to strengthen them and restore proper bladder functions in women with urinary stress incontinence.¹⁴ Small vaginal cones of increasing weight may be used to help with exercise.^{14,15}

Biofeedback uses measuring devices to help the patient become aware of his or her body's functioning. By using electronic devices or diaries to track when the bladder and urethral muscles contract, the patient can gain control over these muscles. Biofeedback can be used with pelvic muscle exercises and electrical stimulation to relieve stress and urge incontinence.

In time voiding, the patient fills in a chart of voiding and leaking. From the patterns that appear in the chart, the patient can plan to empty his or her bladder before he or she would otherwise leak.¹

Bladder Training attempts to break the cycle by teaching patients to void on a schedule, rather than in response to urgency. The information gathered from the bladder diary is used to guide decision making for bladder re-training, including a voiding schedule if necessary to increase the capacity of the bladder for people with frequency issues. It is also important to teach^{16,17}

KEGEL'S EXERCISES

Kegel's exercises are pelvic floor exercises, called after Dr. Arnold Kegel who developed them to strengthen the pelvic floor muscles. Dr. Kegel originally proposed his exercises as an alternative to needless and ineffective surgery.¹⁸

PFME and electrical stimulation: Electrical stimulation (ES) is another intervention used by physiotherapists to reduce UI. The physiological objectives of ES are to produce muscle hypertrophy, to normalize the reflex activity of the lower urinary tract, and to increase circulation to muscles and the capillary system. However, ES is a priority for women with difficulty in contracting the PFM initially.^{19,20} ES of the pudendal nerve improves urethral closure by activating the PFM.²¹ It may also increase conscious awareness of the action of these muscles to yield an improved ability to perform a voluntary muscle contraction.²²

BEHAVIORAL THERAPY

The focus of behavioral therapy is on

- lifestyle changes such as fluid or diet management, weight control, and bowel regulation.
- Education about bladder irritants, like caffeine, is an important consideration.¹²
- Education and explanation about normal lower urinary tract

function is also included.

- Patients should understand the role of the bladder and the pelvic floor muscles.¹³

DEVICES

- Absorbent products (include shields, undergarments, protective underwear, briefs, diapers, adult diapers and underpants)
- Indwelling catheters (also known as Foleys)
- Intermittent catheters.¹

Several studies have been demonstrated that pelvic floor muscle training is effective to treat urinary incontinence in women.

OBJECTIVE OF THE STUDY

The objective of the present study was to review and discuss the effect of pelvic floor muscle (PFM) Exercise on urinary incontinence in women

METHODOLOGY**SEARCH DURATION:**

Article published from 1995-2017 were included in this review.

SEARCH DATABASE:

Studies were identified from following database.

Google scholar, Cochrane Library, Pubmed, Wikipedia, Physiopedia

STUDY DESIGN:

Randomized controlled trials and non-randomized controlled trials, systemic review and comparative studies were included in this review of in relation to urinary incontinence, and/or adherence to a PFME program in antenatal, post-natal, elder women and all type of urinary incontinent women.

INCLUSION CRITERIA:

- Articles published in English language
- Articles between 1995 to 2017
- Articles which includes, PFME program in antenatal, post-natal, elder women and all type of urinary incontinence in women

EXCLUSION CRITERIA:

- Articles published in languages other than English
- Case reports
- Comments and letters or report information

RESULT

We selected 27 relevant research reports in the period of 1995 to 2017 of which few are full-text articles on treating urinary incontinence in women few are abstracts and 5 review articles. Almost studies included in the review achieved positive results but few articles shown that it is more effective while using with other Physiotherapy treatment and one article they have recommend for further investigation especially in elder women. They indicated that Pelvic floor muscle exercise significantly reduced the development of urinary continence

DISCUSSION

According to the International Continence Society (ICS), urinary incontinence (UI) is defined as any involuntary loss of urine. It is one of the most common problems of public health in elderly women and Post pregnancy creating a great impact in the quality of life of the institutionalized and Community population. An efficient treatment for urinary incontinence requires studying women as a whole, taking in consideration not only the pathology, but also the social and emotional aspects involved. As a first-choice conservative treatment, pelvic floor muscles Exercise or Training (PFME), as first proposed by Kegel, with the goal to increase support of the inferior urinary tract, as well as promote the urethral closing by involuntary contraction of the periurethral muscles are highly recommended

Literature demonstrates that PFME when performed regularly can improve pelvic floor muscle function. Due to this factor, it is believed that improved functionality can be directly associated with a decrease in the number of urinary leakage events, and consequently improve quality of life for these women.

In our study of reviewing literatures from 1995 to 2017 has reveal the Efficacy of pelvic floor muscle exercises in women with stress, urge, and mixed urinary incontinence as well as in Prenatal and postnatal it

is proven effective. Few of articles in this literature review regarding PFME in urinary symptoms within elderly women is inadequate. As preliminary evidence exist that suggest that this type of treatment require further investigations.²³

Meta-Analysis studies prove the effectiveness of PFME in urinary symptoms of incontinent women. In few studies it has been shown that PFME is more effective while using it with other Physiotherapy treatments such as biofeedback, time voiding cycle, behavioural therapy compare to alone PFME. Taking in consideration the available studies, the evidence favorable towards the usage of PFME in treating urinary symptoms in elderly women is weak.

In the recent study it has been shown that, there was significant effect of the abdominal muscle exercise on the function of the pelvic floor muscles in mild stress urinary incontinence. As the pelvic floor contraction enhances closure of the urethra. With this closure pressure in the urethra is elevated and leakage is avoided. Studies also shown that pelvic floor exercises are superior for treating SUI compared with electrical stimulation, biofeedback, and vaginal cones. Pelvic floor exercise has a long term benefit for patients after vaginal and caesarean birth. The relevant literature reports that urinary incontinence is common during pregnancy and increases with increasing gestation until term^{24, 25} after delivery, the symptoms promptly decrease, indicating that the pregnant uterus may play a role.²⁵

Various studies shown that supervised antenatal and postnatal pelvic floor muscle training is protective against UI particularly in high risk groups. These studies evaluated the benefits of unsupervised PFME only due to limited scope of providing long term supervised PFME and such a study could be the focus of further study.

The main functional component of the pelvic floor is the levator ani muscle. When this muscle contracts, it compresses the urethra, thus helping to maintain continence.²⁶ There is a significant reduction in prevalence of stress urinary incontinence and increase in pelvic floor muscle strength was maintained one year after delivery in a group of women following an eight-week intensive exercise course between the 8th and 16th week after giving birth, compared with a matched control group.

Although, complete cessation is not always achieved, many women consider themselves cured.⁵⁴ in one study; both groups achieved a decrease in the amount of leaked urine. It is clear that longer follow-up is needed to reveal whether patients are satisfied with this result or seek a more invasive cure for incontinence, there is the additional problem that many find too burdensome the daily exercises necessary to increase muscle strength and control

Further recommendation for Physiotherapists from this review is correct assessment of PFM strength is crucial when prescribing an exercise program according to patient needs, when determining the correct exercise load, and when demonstrating the effectiveness of the exercise. Regular PFM reassessment is suggested so that new exercise programs can be established however, there have been few studies with two-dimensional ultrasonography that have assessed changes in PFM strength after exercise training.

CONCLUSION

Physical exercise, specifically pelvic floor muscle Exercise programmes, has positive effects on urinary incontinence. This type of training has been shown to be an effective program for treating urinary incontinence in women. Further recommendation is to develop standardized Pelvic floor exercise programs.

REFERENCES

1. www.wikipedia.org
2. Pamela k. levangie , Cynthia c. norkin; joint structure and function (ed.5) 2012
3. Urinary incontinence in women: management; NICE Clinical Guideline (September 2013)
4. Sangsawang, Bussara; Sangsawang, Nucharee (2013). "Stress urinary incontinence in pregnant women: a review of prevalence, pathophysiology, and treatment". *International Urogynecology Journal*. 24 (6): 901–912. ISSN 0937-3462. doi:10.1007/s00192-013-2061-7
5. Shamlivan, T; Wyman, J; Bliss, DZ; Kane, RL; Wilt, TJ (December 2007). "Prevention of urinary and fecal incontinence in adults.". Evidence report/technology assessment (161): 1–379. PMID 18457475
6. Karlovsky, Matthew E. MD, Female Urinary Incontinence During Sexual Intercourse (Coital Incontinence): A Review, The Female Patient (retrieved 22 August 2010)
7. Urinary Incontinence: Causes, Treatments, and Symptoms By Christian Nordqvist . 24 August 2016 .
8. Miller JM, Sampelle C, Ashton-Miller J, Son Hong G-R, De Lancey JOL. Clarification

- and confirmation of the Knack maneuver: the effect of volitional pelvic floor muscle contraction to preempt expected stress incontinence. *Int Urogynecol J* 2008;19:773-782
9. Shamlivan T, Wyman JF, Ramakrishnan R, Sainfort F, Kane RL (June 2012). "Systematic Review: Benefits and Harms of Pharmacologic Treatment for Urinary Incontinence in Women". *Annals of Internal Medicine*. 156: 861–74, W301–10. PMID 22711079. doi:10.7326/0003-4819-156-12-201206190-00436.
10. Qaseem, A; Dallas, P; Forciea, MA; Starkey, M; Denberg, TD; Shekelle, P; for the Clinical Guidelines Committee of the American College of Physicians (Sep 16, 2014). "Nonsurgical Management of Urinary Incontinence in Women: A Clinical Practice Guideline From the American College of Physicians.". *Annals of Internal Medicine*. 161 (6): 429–440. PMID 25222388. doi:10.7326/m13-2410.
11. Ghosh, Amit K. (2008). *Mayo Clinic internal medicine concise textbook*. Rochester, MN: Mayo Clinic Scientific Press. p. 339. ISBN 9781420067514.
12. Laycock J. Pelvic muscle exercises: physiotherapy for the pelvic floor. *Urologic Nursing* 1994;14:136-40.
13. Alewijnse D, Metsmakers JFM, Mesters I, van den Borne. Effectiveness of pelvic floor muscle exercise therapy supplemented with a health education program to promote long-term adherence among women with urinary incontinence. *Neurology and Urodynamics* 2003;22:284-295
14. Herbison, GP; Dean, N (8 July 2013). "Weighted vaginal cones for urinary incontinence.". *The Cochrane database of systematic reviews* (7): CD002114. PMID 23836411. doi:10.1002/14651858.CD002114.pub2
15. Burgio KL. Current perspectives on management of urgency using bladder and behavioral training. *J Am Academy Nurse Pract* 2004;16:4-7.
16. Payne CK. Behavioral therapy for overactive bladder. *Urology* 2000;55:3-6.
17. MacLennan AH, Taylor AW, Wilson DH, et al. The prevalence of pelvic floor muscle disorders and their relationship to gender, age, parity and mode of delivery. *BJOG* 2000;107:1460-709. 10. 11. 4.
18. Laycock J: Clinical guidelines for the physiotherapy management of females aged 16–65 years with stress urinary incontinence. London: Chartered Society of Physiotherapy, 2001
19. Bernards ATM, Berghmans LCM, van Heeswijk-Faase IC, et al. : KNGF Guideline for physical therapy in patients with stress urinary incontinence. de Fysiotherapeut Royal Dutch Society for Physical Therapy, 2011, 121: 1–43.
20. Sand PK, Richardson DA, Staskin DR, et al. : Pelvic floor electrical stimulation in the treatment of genuine stress incontinence: a multicenter, placebo-controlled trial. *Am J Obstet Gynecol*, 1995, 173: 72–79 [PubMed]
21. Yamanishi T, Yasuda K, Sakakibara R, et al. : Pelvic floor electrical stimulation in the treatment of stress incontinence: an investigational study and a placebo controlled double-blind trial. *J Urol*, 1997, 158: 2127–2131 [PubMed]
22. L.C.M. Berghmans, C.M.A. Frederiks, R.A. de Bie, E.H.J. Weil, L.W.H. Smeets, E.S.C. van Waalwijk van Doorn, and R.A. Janknegt (1995). Efficacy of Biofeedback, When Included With Pelvic Floor Muscle Exercise Treatment, for Genuine Stress Incontinence, *Neurourology and Urodynamics* 1537-52 (1996)
23. Cardozo L, Cutner A (1997) Lower urinary tract symptoms in pregnancy. *Br J Urol* 8(supply 19):14–23
24. Viktrup L, Lose G, Rolf M, Barfoet K (1993) The frequency of urological symptoms during pregnancy and delivery in primipara. *Int Urogynecol J Pelvic Floor Disfunc* 4:27–30
25. DeLancey, J.O.L. Structural aspects of the extrinsic continence mechanism. *Obstet Gynecol*. 1988; 72: 292–301
26. Knight, S.J. and Laycock, J. The role of biofeedback in pelvic floor re-education. *Physiotherapy*. 1994; 80: 145–148