



PHYSIOTHERAPY MANAGEMENT IN PATIENT WITH URINARY INCONTINENCE : A CASE STUDY

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Abstract

Introduction: Urinary incontinence (UI) is the problem of accidental or abnormal loss (leakage) of urine. The physiotherapy management of ES (Electrical Stimulation), Kegel Exercises, and Abdominal Muscle Exercise in increasing the strength of pelvic floor muscle and abdominal muscle strength in patients with urinary incontinence.

Case Presentation: A female 25 year old comes to the doctor with complaints of difficulty urinating postpartum for 6 months, the doctor diagnoses the patient with urinary incontinence then referred to physiotherapy for further treatment

Management and Outcome: Giving of electrical stimulation, kegel exercise, and abdominal muscle exercise effective to increase the strength of the pelvic floor muscle and abdominal muscle as well as decrease severity of urinary incontinence in patient urinary incontinence

Discussion: After physiotherapy exercise interventions were given, the results obtained were an increase in the strength of the pelvic floor muscle from Pre-Test with a strength of the pelvic floor value of 2, an increase in strength of the pelvic floor to 3 at T8, an increase in the abdominal muscle strength at Pre-Test the result is 3 and becomes 4 at T8, and there is a decrease in severity of urinary incontinence at Pre-Test the result is 8 and becomes 6 at T8. Giving of electrical stimulation, kegel exercise, and abdominal muscle exercise effective to increase the strength of the pelvic floor muscle and abdominal muscle as well as decrease severity of urinary incontinence in patient urinary incontinence.

Conclusion: After given by physiotherapy modalities and exercise in urinary incontinence it show a good progression. The physiotherapi's treatment showed that there was an increase pelvic floor muscle strenght and abdominal muscle as well as decrease severity of urinary incontinence

Keyword: Urinary incontinence (UI), pelvic floor muscle, kegel exercise, electrical stimulation, abdominal muscle exercise.



Introduction

Urinary incontinence is the problem of accidental or abnormal loss (leakage) of urine⁽¹⁾. There are three main types of urinary incontinence, namely: stress incontinence urine is the accidental discharge of urine when coughing, sneezing, and straining, urge incontinence urine is the accidental discharge of urine with a sudden desire to urinate, mixed incontinence urine is a combination of stress incontinence and urge incontinence⁽²⁾. Urinary incontinence is more common in women compared to men, the condition is often found in women during pregnancy to the postpartum period, it has been reported that this condition occurs as much as 18.6% to 75% during the period of pregnancy, and 6% to 31% during the postpartum period⁽³⁾. Population studies from various countries have reported that the prevalence of urinary incontinence ranges from 5% - 70% with most studies reporting the prevalence of urinary incontinence in the range of 25%-45%⁽⁴⁾. The main causes of urinary incontinence are related to dysfunction of the bladder and pelvic floor muscle. The risk of urinary incontinence increases with age, but can also occur postpartum⁽⁵⁾. Urinary incontinence also has coordination problems between activation of the bladder destrutor and clousur of the urethra. Activation of the pelvic floor and abdominal muscle in a coordinated important for urinary continance. There is evidence that specific abdominal muscle manoeuvres influence urethral closure in continent women, and this is probably mediated by concurrent activation of pelvic floor muscle during the abdominal activation⁽⁶⁾.

Electrical stimulation is the most common method for urinary incontinence, the resulting current flow causes contractions in the pelvic floor muscle and inhibits the activity of destrutor muscles⁽⁵⁾. Kegel exercises are the pelvic or gymnastics train which aims to strengthen the pelvic muscles, especially the pubococcygeal muscles so that a woman can strengthen the urinary tract muscles. Kegel exercises can also cure the inability to hold urine (urinary incontinence)⁽⁷⁾. Training of abdominal muscle important for urinary incontinence. Coordination between tranversus abdominis and pelvic floor muscle located adjacent to the urethre is associated with increased mid-urethra pressure with abdominal withdrawal maneuvers⁽⁶⁾.

Case Presentation

A Housewife 25 year old Ny. N was treated by a doctor at Hospital in Semarang in May 2021 with complaints of not being able to hold urinated after giving birth to her first child for 6 months. Complaints increase when the patient is coughing and sneezing. Postpartum wounds make patients lazy to urinate into the bathroom and tend to resist urination. Afterwards the patient struggles to resist urination and often wets. The patient urinates approximately once an hour every day, sometimes the urine has come out before the patient reaches the bathroom. By the doctor performed a pelvic floor muscle strength examination using Manual Muscle Testing. The patient is then diagnosed with urinary incontinence by a doctor and referred to physiotherapy. Currently patients use catheters. By physiotherapist conducted Cough Stress Test with results (+), measuring functional ability and activity environment using Katz Index with result B (self-contained with five activities), Sahrman Core Abdominal Core Stability to measure abdominal muscle strength and measurement of severity of incontinence using Sandvic Severity Index. Vital signs examination is performed before physiotherapy intervention is given, resulting in blood pressure of 120/80 mmHg, pulse rate of 80x/min, and body temperature of 36.6 °C.

Management and Outcome

Intervention given to the patient must be in accordance with some of the problems felt by the patient such as pelvic floor muscle weakness and abdominal muscle weakness. Physiotherapy intervention given in the form of ES (Electrical Stimulation) which aims for bladder relaxation and contraction of pelvic floor muscle, the second is Kegel Exercise aims to strengthening of pelvic floor muscle, the third is Abdominal Muscle Exercise aims to strengthen the abdominal muscles. The catheter is removed when exercise begins.

Tabel 1. Physiotherapy’s Treatment

Intervention	Dose				Information
	Frequency	Intensity	Type	Time	
ES	10 Hz (2 times a week)	200 ms	ES	15 minute	Electrical stimulation is done by installing two electrode pads on the abdomen and sacral ⁽⁸⁾ .

Kegel Exercise (pubovaginalis)	2 times a week	8 reps 3 set	Hold and relax	Hold 10 s Relax 10 s	the patient contracts anterior fibers of pelvic floor muscle (pubovaginalis) to rest 2 minutes before starting the next exercise (9).
Kegel Exercise (puborectalis)	2 times a week	8 reps 3 set	Hold and relax	Hold 10 s Relax 10 s	the patient contracts posterior fibers of pelvic floor muscle (puborectalis) to rest 2 minutes before starting the next exercise
Kegel exercise (pubovaginalis + puborectalis)	2 kali seminggu	8 repetisi 3 set	Hold and relax	Hold 10 s Relax 10 s	the patient contracts anterior and posterior fibers of pelvic floor muscle (pubovaginalis and puborectalis) to rest 2 minutes before starting the next exercise
Training of transverse abdominis	2 times a week	10 sets		30 s	patient position Bird dog on top of bed ⁽¹⁰⁾ .
Training of	2 times a			10 minutes	Patient position

diaphragm	week				supine lying on top of bed, patient exercises abdominal inspiration
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The following are the result of the Pre-Test and the final result of the Treatment 8 (final) after 8 times therapy.

Table 2. Pre-Treatment measurement of Pelvic Floor Muscle Strength (PFM) Using Manual Muscle Testing(MMT)

Strength of PFM	Pre-T	Interpretation
	2	incomplete contraction of the muscles is felt, which persist for two second or contraction-relaxation movement can finish two times

Measurement of PFM strength using MMT get result level 2 (incomplete contraction of the muscles is felt, which persist for two second or contraction-relaxation movement can finish two times). The MMT interpretation is as follows :

Level 0: no sense of muscle contraction is felt

Level 1: the fibrillation of the muscle is felt

Level 2: incomplete contraction of the muscles is felt, which persist for two second or contraction-relaxation movement can finish two times

Level 3: complete contraction of muscles without resistance is felt, persisting for three seconds or contraction-relaxation movement can finish three times

Level 4: complete contraction of muscles with slight resistance is felt, persisting for four seconds or contraction-relaxation movement can finish four times

Level 5 : complete contraction of muscles with strong resistance is felt, persisting for five or more seconds or contraction-relaxation movement can complete five times

Table 3. Results Evaluation of Pelvic Floor Muscle Strength (PFM) Using Modified Oxford Grading Scheme

Strength of PFM	T8	Interpretation
	3	complete contraction of muscles without resistance is felt, persisting for three seconds or contraction-relaxation movement can finish three times

The evaluation of PFM stength using MMT after eight times therapy indicates that there is a change in the increase pelvic floor muscle strength. In Pre-T pelvic floor muscle strength is 2 and when T8 pelvic floor muscle strength is 3 (complete contraction of muscles without resistance is felt, persisting for three seconds or contraction-relaxation movement can finish three times

Tabel 4. Pre-Treatment Measurement Abdominal Muscle (AM) Strength Using Sarhmann Core Stability

Strength AM	Pre -T	Interpretation
	3	From hip flexed position, slowly lower 1 leg until heel is 12 cm above surface. Slide the heel out to fully extend the knee. Return to starting flexed position

Pre-T Abdominal Muscle Strength measurement using Sarhmann Core Stability get result level 3. The Sarhmann Core Stability interpretation is as follows:

Level 0: Unable to achieve level 1 position

Level 1: Begin in supine, hook-lying position while abdominal hollowing. Slowly raise 1 leg to 100 deg of hip flexion with comfortable knee flexion. Bring opposite leg to same position.

Level 2: From hip flexed position, slowly lower 1 leg until heel contacts surface. Slide heel out to fully extend the knee. Return to starting flexed position.

Level 3: From hip flexed position, slowly lower 1 leg until heel is 12 cm above surface. Slide heel out to fully extend the knee. Return to starting flexed position.

Level 4: From hip flexed position, slowly lower both legs until heel contacts surface. Slide heel out to fully extend knees. Return to starting flexed position.

Level 5: From hip flexed position, slowly lower both legs until heels are 12 cm above surface. Slide heel out to fully extend knees. Return to starting flexed position.

Tabel 5. Results Evaluation of Abdominal Muscle (AM) Strength Using Sarhmann Core Stability

Strength AM	T8	Interpretation
	4	From hip flexed position, slowly lower both legs until heel contacts surface. Slide the heel out to fully extend the knees. Return to starting flexed position

The evaluation of abdominal muscle strength level using Sarhmann Core Stability indicates that there is a change in the increase abdominal muscle strength. At Pre-T the abdominal muscle strength level is 3 and when T8 abdominal muscle strength level is 4 (From hip flexed position, slowly lower both legs until heel contacts surface. Slide the heel out to fully extend the knees. Return to starting flexed position).

Table 6. Pre-Test Measurement Severity of Urinary Incontinence with Sandvic Severity Index

Severity UI	Pre-T	Interpretation
	8	severe incontinence

Pre-Test Severity of Urinary incontinence measurement with Sandvic Severity Index get score 8 (severe incontinence). Sandvic Severity Index interpretation is as follows:

Score 0: Continent

Score 1 or 2: Mild incontinence

Score 3 or 6 : Moderate incontinence

Score 8 or 9 : Severe incontinence

Score 12 : Very severe incontinence

Tabel 7. Results Evaluation of The Severity of Urinary Incontinence (UI) with Sandvic Severity Index

Severity UI	T1	Interpretation
	6	moderate incontinence

The evaluation of the severity of urine incontinence measured using the Sandvic Severity Index showed that there was a decrease in the severity of urine incontinence. At T1 the severity of urinary incontinence is 8 (severe incontinence) and when T8 the severity of urinary incontinence is 6 (moderate incontinence).

Discussion

Giving of electrical stimulation and kegel exercises is proven to increase the strength of pelvic floor muscle. Urinary incontinence is believed that the presence of structural damage from neuromuscular and connective tissue that support bladder and urethra, pervaginam delivery is one of the main factors causing urinary incontinence, the first childbirth is also a strong factor triggering urinary incontinence⁽¹¹⁾. The second, third, and fourth sacral nerves control bladder function, where they grow from the third sacral nerve root and are distributed in the bladder destrutor and pelvic floor levator muscles. The third sacral nerve root contains the sensory plexus of the pelvic floor and the motor plexus of the detrusor (parasympathetic), as well as the motor plexus of the speleter and other muscles. Effective electrical stimulation of the third sacred nerve can provide a curative effect through the regulation of the urination reflex mediated by the afferent nerve, promoting the restoration of bladder sensations and establishing a normal urination reflex at the same time⁽¹²⁾.

Kegel exercise can provide stimuli that can increase the activation of neuromuscular and muscular. Smooth muscles in the bladder contain actin and myosin filaments that have chemical properties and interact with each other. This interaction process is activated by ion-calsium and adhenotriphospat ions which are then broken down into adhenodiphospat to provide energy for contraction of the bladder destrutor muscles and can indirectly increase the smooth muscle tone of the bladder⁽¹³⁾.

The relationship between the pelvic floor muscle and the abdominal muscles and diaphragm is the pelvic floor muscle contract and relax during inhalation and exhalation in pace with diaphragms, activity of the pelvic floor muscle increase with the increase of intra-abdominal pressure during forced exhalation or cough. The role of the pelvic floor is essential for the synergy of diaphragm and abdominal muscle in maintenance of intra-abdominal pressure. Therefore, training of abdominal muscle important for urinary incontinence⁽¹⁴⁾.

Conclusion

After physiotherapy intervention in the form of electrical stimulation, kegel exercise and strengthening abdominal muscle in the case of urinary incontinence given during 8 therapy sessions obtained the results that there is an increase in the strength of the pelvic floor muscle, abdominal muscle strength and severity of urinary incontinence.

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