**CONSERVATIVE STUDY BETWEEN KEGEL AND AEROBICS EXERCISE V/S KEGEL AND PILATES EXERCISES IN POSTPARTUM STRESS INCONTINENCE**

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# ABSTRACT

**BACKGROUND:** Stress urinary incontinence in the post-partum is a significant health problem in women with serious physical, psychological, and social consequences. The prevalence of stress urinary incontinence varies at 10–39%. In India, 12% women are affected by it, while 14.5% suffer from this disorder across Asia. While 5% cases have been reported in women below the age of 30, it increases to about 30% in women in the age group of 30 to 60 years. 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. The pilates method has beneficial effects on pregnant women, since it allows increasing the thoracic cavity through exercises as well as strengthening the abdominal muscles and improving urinary incontinence. Aerobic exercises, muscular strengthening and flexibility exercises has usually the indication for treatment and prevention processes of stress urinary incontinence.

**AIMS AND OBJECTIVES:** To compare the effect of kegel exercise and aerobic exercise v/s kegel exercise and pilates exercises in postpartum stress urinary incontinence.

**METHODOLOGY:** Thirty female patients having postpartum stress incontinence were randomly selected according to inclusion and exclusion criteria and divided into two groups – Group A and Group B. Modified Oxford Grading Scale and The Questionnaire for Urinary Incontinence Diagnosis were used as outcome measures. Group A was treated with aerobic exercise and Group B reated with pilates exercises. Both the groups were received kegel exercise along with respective technique. The data was obtained from both the groups at beginning of the study as pre-test and at the end of twelve weeks as post-test. Mean, standard deviation, paired and unpaired “t” test was used for data analysis.

**RESULT:** The mean age of group A was 42.87 years and Group B was 43.73 years. The group A treated with kegel exercise and aerobic exercise had higher significance when compared to group B treated with kegel exercise and pilates exercises. The mean improvement in Modified Oxford Grading Scale scores was 1.33 in group A and 1.07 in group B. The mean improvement in The Questionnaire for Urinary Incontinence Diagnosis scores was 7.20 in group A and 5.33 in group B. It was resulted that group A received kegel exercise and aerobic exercise had a superior effect over group B received kegel exercise and pilates exercises.

**CONCLUSION:** It was concluded that kegel exercise along with both aerobic exercise and pilates exercises to be an effective in postpartum stress urinary incontinence but Kegel exercise along with aerobic exercise was more effective and can be used as a treatment of postpartum stress urinary incontinence.

**KEY WORDS:** Stress urinary incontinence, Kegel exercise, Aerobic exercise, Pilates

## INTRODUCTION

Stress urinary incontinence in the post partum is a significant health problem in women with serious physical, psychological, and social consequences.1

Stress urinary incontinence is involuntary loss of urine with sneezing, coughing and effort and is a frequent and bothersome symptom that is common in the elderly population. Millions of women are affected with stress urinary incontinence.2

The prevalence of stress urinary incontinence varies at 10–39%. It is reported that about half of women with urinary incontinence describe symptoms of stress incontinence. About a third of women have urinary incontinence and up to a tenth have fecal incontinence after child birth. Incontinence of urine affects 200 million people worldwide. Up to 30% of women who have had children are affected by some degree of prolapse also. In India, 12% women are affected by it, while 14.5% suffer from this disorder across Asia. While 5% cases have been reported in women below the age of 30, it increases to about 30% in women in the age group of 30 to 60 years.3

The pelvic floor is a complex integrated collection of innervated ligaments, muscles and extracellular matrix found in both males and females. Its primary role is to provide support to the pelvic organs and to protect the bladder, urethra, reproductive organs, and the rectum.4 Three orifices weaken the pelvic floor in females: the vagina, the urethra and the anus. Therefore, the musculature and ligamentous structures in this area must be strong and supportive to prevent pelvic floor disorders6. The strength of these muscles maintain the pelvic floor structure and directly support the urethral, vaginal and anal sphincters. The deep muscles of the pelvic floor are commonly known as the levator ani muscles Stress Urinary Incontinence is called as a silent epidemic which is not a life threatening condition, but a worldwide problem at the same time. It affects the quality of life of at least one third of women globally in many ways and may limit women‘s social and personal relationships. Stress Urinary Incontinence starts gradually over time and increases, often to the point of causing women to stop doing many of their normal activities. Obviously, in women suffering from stress urinary incontinence, leakages are the most important factor affecting the quality of life adversely.8

Stress urinary incontinance causes wetness, odor, discomfort, and skin irritation; it can also damage self-esteem as a result of feelings of shame, embarrassment and stigmatization. Also, women with Stress urinary incontinance usually suffer of affected sexual relationships because of the fear of urine leakage during sexual activity.9 others are embarrassed to speak with a health care provider about their condition or fear that treatment will require surgery.10.11

As pregnancy progresses the fetus starts to descend, which increases the amount of pressure placed on other organs in the pelvic region. It is common for pregnant women to report increased urinary urgency as a result of the bladder having less room to expand and accumulate urine12. Pregnancy can also potentially push the bladder forward causing an increase in the angle between the bladder neck and the urethra which may lead to urinary incontinence.13.

This difference in hiatal dimensions between vaginal and C-section deliveries may be caused by the increased occurrence of levator ani avulsions during vaginal delivery15. Studies have shown a correlation between the number of avulsions to the increased hiatal dimensions post-vaginal delivery.16 Women with these avulsions are at risk for a reduction of pelvic floor muscle strength which may be a leading cause of pelvic floor disorder. Instrument-assisted deliveries may further increase the chances of some dysfunctions. The use of forceps during delivery can increase the rate of levator ani muscle damage as much as 35-64%. The greater the levator ani muscle trauma, the more likely of pelvic floor dysfunction. Other risk factors leading to pelvic floor impairments during delivery include delayed childbearing, large head circumference, prolonged second stage of labor, pushing during the second stage of labor and increased age of the mother during pregnancy.17

Arnold Kegel first described pelvic floor exercises (Kegel exercises) as a treatment method in 1948.30 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.31

Pilates method is one of the techniques extensively used by physical therapists, since it provides physical conditioning as well as body control and awareness. The pilates method has beneficial effects on pregnant women, since it allows increasing the thoracic cavity through exercises as well as strengthening the abdominal muscles and improving urinary incontinence.32

Evidence reveals that stress urinary incontinence exerts a negative impact on multiple components of health related quality of life, including working life, emotional and social life, finances, sexual life, and self-esteem. Little research, however, has investigated the way in which women manage the distressing symptoms associated with stress urinary incontinence and how self-management strategies vary, depending on work and lifestyle commitments. It is therefore very important to offer adequate treatment to cure the problem among women suffering from stress urinary incontinence for both physical and psychological impact and substantially quality of life disturbance. Hence, in this study an attempt was made to find out the effectiveness of kegel exercise, aerobic exercise and pilates exercises in postpartum stress incontinence.

**METHODOLOGY:** It is a comparative study in which30 female patients diagnosed with postpartum stress incontinence wasrandomly allocated according to inclusion and exclusion criteria and divided into two groups.

Group A: Kegel exercise and aerobic exercise Group B: Kegel exercise and Pilates exercise

12 Weeks. 45 minutes sessions at least 5 times each week in Manipal Hospital, Jaipur in department of physiotherapy.

**INCLUSION CRITERIA:**

1. Post partum stress urinary incontinence
2. Age 30 – 50 years
3. Non-smoker

1. Non obese women

**EXCLUSION CRITERIA:**

1. History of gynecological abnormalities
2. Current acute urinary tract infection
3. Intake of diuretics or other drugs
4. Neurological illness
5. Psychological illness
6. Any associated chronic diseases and/or conditions

**OUTCOME MEASURES:** Modified Oxford Grading Scale (MOGS)71**,** The Questionnaire for Urinary Incontinence Diagnosis (QUID)72

## PROCEDURE: After collecting written consent form from 30 female patients diagnosed with postpartum stress incontinence were randomly selected according to inclusion and exclusion criteria and divided into two groups – Group A and Group B.

Group A was treated with aerobic exercise and Group B treated with pilates exercises. Both the groups were received kegel exercise along with respective technique.

Pre and post-test data of outcome measures were collected and analysed.

**BOTH GROUPS – KEGEL EXERCISES**

Steps of practicing Kegel exercises were:

1. Identification of the muscles.
2. Contracting the muscles correctly.
3. Fast and slow contractions.

Position of the patient: Supine with both knees bent and feet flat on the floor. Method: First, identify and feel the pelvic floor muscles. Squeeze and elevate the muscles around the vagina.

### The slow contractions of Kegel exercises:

It helps 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 of Kegel exercises:

It helps 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.

These were:

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.

**GROUP A – AEROBIC EXERCISES**74**:**

1. **Warm-up:** 5 minutes
	1. Gentle stretching
	2. Gentle walk with Shaking hands and legs and clenching and unclenching the hands.
	3. Arm swinging and circling
2. **Strength and conditioning exercises:** 30 minutes

### Squat :

Position of the patient: Standing with feet apart

Method: Inhale and contract and lift pelvic floor muscles while sitting down and exhale on standing. Repeat 10 times.

* 1. **Cat and camel exercise:**

Position of the patient: Quadripod position

Method: First release pelvic floor muscle by rotating pelvic. Move lower back down with inspiration. Hold for few seconds and move lower back upward direction with expiration. Repeat 10 times.

* 1. **Walking:** Walk slow to moderate speed and progress to brisk walk for 10 minutes.
	2. **Jumping:** Jumping with pelvic floor muscle contraction. Repeat 20 times.
	3. **Skipping:** Skipping for 5 minutes.
1. **Cool down:** 5 Minutes
	1. Punching thigh: Lift your thigh to a comfortable height and gently punch it. Repeat with opposite leg.
	2. Tense and Relax: Inhale, clench hands, gently contract the muscles of body and stand on your toes if possible then Exhale and letting everything relax.
	3. Recreational activities

**GROUP B – PILATES EXERCISES**75**:**

### Pelvic Clock (Supine / Crook-lying):

Position of the patient: Supine leg flexed, core engaged and neutral pelvis or crook lying.

Method: Move pelvis like a clock to facilitate spinal flexion, extension, lateral flexion and rotation. Imagine clock face on pelvis facing towards the celling. Elevate the pelvis so that it 6’clock is higher, than lower pelvis so that 12 o’clock is higher. Repeat 10 times.

1. **Bridging (Supine / Crook-lying):**

Position of the patient: Supine or Crook-lying

Method: Move pelvis for posterior pelvic tilt, than elevate the pelvis. Repeat 10 times.

1. **Chest lift (Supine / Crook-lying):**

Position of the patient: Supine or Crook-lying

Method: Hands interlaced behind the head, followed by segmental flexion with cervical and thoracic spine.

1. **The Hundred (Supine):**

Position of the patient: Supine with both hips and knees on 90 - 90 degrees flexion. Chin tucked and core engaged.

Method: Breathe in and out for 10 breaths. As you breathe in and out, gentle pumping the arms up and down by your sides. Repeat 10 times.

### Roll up (Supine):

Position of the patient: Supine or Crook-lying

Method: Move pelvis like a clock to facilitate spinal flexion, extension, lateral flexion and rotation.

**DATA ANALYSIS**

Mean standard deviation, paired 't' test and unpaired 't' test would be performed for analysis of pre and post data evaluation within and between groups.

## RESULT AND DATA INTERPRETATION

## The present study titled as conservative study between kegel and aerobics exercise v/s kegel and pilates exercises in postpartum stress incontinence was done to compare two groups for the significant difference. The data was obtained from both the groups, analysed and results interpreted.

1. **DEMOGRAPHIC PRESENTATION OF DATA IN GROUPS:**

 **TABLE: 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **GROUPS** | **GENDER** | **NUMBER** | **AGE IN YEARS** |
| **MEAN** | **SD** |
| GROUP A | F | 15 | 42.87 | 3.76 |
| GROUP B | F | 15 | 43.73 | 4.04 |
| TOTAL | F | 30 | 43.30 | 3.86 |

**INTERPRETATION:**Table 1 show that Group A had a mean age of 42.87 years and Group B had a mean age of 43.73 years. The average age of female patients in both groups was 43.30 years.

1. ANALYSIS OF PRE-TEST VALUES OF MODIFIE OXFORD GRADING SCALE (MOGS) BETWEEN GROUPS:

**TABLE: 2**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **N** | **SD** | **SEM** | **Mean Diff** | **SD****Diff** | **T** | **P** |
| Group A | 3.07 | 15 | 0.70 | 0.18 | 0.34 | 0.18 | 1.143 | 0.2628NS |
| Group B | 2.73 | 15 | 0.88 | 0.23 |

NSNon-Significant difference (P<0.05)

**INTERPRETATION:**The above table shows the mean of pre-test values were 3.07 and 2.73 in group A and B, respectively. The mean difference between groups was 0.34. The ‘t’ value1.143 and ‘P’ value 0.2628. When compared to table value, the above ‘P’ value is greater than P<0.05, which is not significant.

1. ANALYSIS OF PRE-TEST VALUES OF THE QUESTIONNAIRE FOR URINARY INCONTINENCE DIAGNOSIS (QUID) BETWEEN GROUPS**:**

**TABLE: 3**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **N** | **SD** | **SEM** | **Mean Diff** | **SD****Diff** | **T** | **P** |
| Group A | 10.80 | 15 | 2.27 | 0.59 | 0.33 | 0.24 | 0.4234 | 0.6752NS |
| Group B | 11.13 | 15 | 2.03 | 0.52 |

NSNon-Significant difference (P<0.05)

**INTERPRETATION:**The above table shows the mean of pre-test values were 10.80 and 11.13 in group A and B, respectively. The mean difference between groups was 0.33. The ‘t’ value 0.4234 and ‘P’ value 0.6752. When compared to table value, the above ‘P’ value is greater than P<0.05, which is not significant.

1. ANALYSIS OF POST-TEST VALUES OF MODIFIED OXFORD GRADING SCALE (MOGS) BETWEEN GROUPS:

 **TABLE: 4**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **N** | **SD** | **SEM** | **Mean Diff** | **SD****Diff** | **T** | **P** |
| Group A | 4.40 | 15 | 0.63 | 0.16 | 0.60 | 0.14 | 2.324 | 0.0276s |
| Group B | 3.80 | 15 | 0.77 | 0.20 |

S= Significant Difference

 **ANALYSIS OF PRE-TEST AND POST-TEST VALUES OF THE QUESTIONNAIRE FOR URINARY INCONTINENCE DIAGNOSIS (QUID) WITHIN GROUP B:**

 **TABLE**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **N** | **SD** | **SEM** | **Mean Diff** | **R** | **T** | **P** |
| Pre-test | 11.13 | 15 | 2.03 | 0.52 | 5.33 | 0.6065 | 8.677 | 0.0083S |
| Post-test | 5.80 | 15 | 2.98 | 0.77 |

S= Significant Difference

**INTERPRETATION:**The above table shows the mean of pre-test and post-test values were 11.13 and 5.80, respectively. The mean difference was 5.33. The ‘t’ value 8.677 and ‘P’ value 0.0083. When compared to table value, the above ‘P’ value is less than P<0.05, which shows significant effect.

**MEAN IMPROVEMENT IN MODIFIED OXFORD GRADING SCALE (MOGS) AND QUESTIONNAIRE FOR URINARY INCONTINENCE DIAGNOSIS (QUID) SCORES BETWEEN GROUPS:**

**TABLE**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Group** | **N** | **Mean** |  | **Group** | **N** | **Mean** |
| **MOGS** | AB | 1515 | 1.331.07 | **QUID** | AB | 1515 | 7.205.33 |

**INTERPRETATION:**The table 10 shows the mean improvement in Modified Oxford Grading Scale (MOGS) score was 1.33 in Group A and 1.07 in Group B. Mean improvement in Questionnaire for Urinary Incontinence Diagnosis (QUID) score was 7.20 in group A and 5.33 in group B.

It was resulted that Group A treated with kegel exercise and aerobic exercise were effective and showed improvement in postpartum stress urinary incontinence. Group B treated with kegel exercise and pilates exercises also showed improvement in postpartum stress incontinence.

When both groups were compared, group A treated with kegel exercise and aerobic exercise had superior effect over group B treated with kegel exercise and pilates exercises on improvement in postpartum stress incontinence.

## DISCUSSION

This study aimed to find out the cause of postpartum stress urinary incontinence and compare the effect of kegel exercise and aerobic exercise v/s kegel exercise and pilates exercises in postpartum stress urinary incontinence.

The sample consisted of 30 women aged between 30 to 50 years diagnosed with postpartum stress incontinence randomly assigned as per inclusion and exclusion criteria to either in group A ie. experimental (n = 15) or group B ie. control (n = 15) group. Both groups attended 12 weeks study, 45 minutes sessions at least 5 times each week. Participants in the group A received kegel exercise and aerobic exercise and Group B received kegel exercise and pilates exercises.

The data was obtained from both the groups at beginning of the study as pre-test and at the end of twelve weeks as post-test. Outcome measures used for pre and post test data collection were Modified Oxford Grading Scale (MOGS) and Questionnaire for Urinary Incontinence Diagnosis (QUID). Collected data were assessed and results interpreted.

Present study showed the mean age of subjects in group A was 42.87 and in the group B was 43.73. The average age of female patients in both groups was 43.30 years.

The mean of pre-test values of Modified Oxford Grading Scale were 3.07 and 2.73 in group A and B, respectively. The mean of pre-test values of and Questionnaire for Urinary Incontinence Diagnosis were 10.80 and 11.13 in group A and B, respectively. The pre-test values of both the outcome measures were non-significant between both the groups.

The mean of post-test values of Modified Oxford Grading Scale were 4.40 and 3.80 in group A and B, respectively. The mean of post-test values of and Questionnaire for Urinary Incontinence Diagnosis were 3.60 and 5.80 in group A and B, respectively. The post-test values of both the outcome measures showed significant effect of treatment between both the groups.

The result of the study showed that Group A treated with kegel exercise and aerobic exercise and group B treated with kegel exercise and pilates exercises showed improvement in postpartum stress incontinence within groups but when both groups were compared, group A treated with kegel exercise and aerobic exercise had superior effect on improvement in postpartum stress urinary incontinence. Some previous studies found similar results to the current one that stated that pelvic floor muscle exercises increased pelvic floor muscles strength and significantly reduced the frequency and amount of urine leakage. Finnbogadottir et al. (2016)78 agree with this finding who reported that about one quarter of women receiving pelvic floor muscle strengthening training were cured and that majority of them reported improvement in their symptoms. The current result is similar to a study carried out by Marzieh et al. (2015)79 who found that more than half of women who received Kegel's exercise training pronounced their stress urinary incontinence as not a problem‖ after treatment compared with minority of controls. Moreover, Gilmour (2017)80 reported that women who performed Kegel's training had at least a fifty percent decreased urine loss compared to controls. Benvenuti (1987)81 stated that pelvic floor muscle training significantly increased pelvic floor muscle strength, improved quality of life, and reduced the frequency of urinary incontinence episodes.

## CONCLUSION

The present study concluded that kegel exercise along with both aerobic exercise and pilates exercises to be an effective in postpartum stress urinary incontinence. Hence, Kegel exercise, aerobic exercise and pilates exercises can be used as a treatment of postpartum stress urinary incontinence.

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