

## ORIGINAL ARTICLE

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## EFFICACY OF PELVIC FLOOR THERAPY IN TREATING URINARY INCONTINENCE AMONG FEMALE COPD PATIENTS

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## ABSTRACT

**Background:** Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality worldwide. The major manifestation of COPD includes dyspnea, decreased oxygenation and reduced exercise tolerance. The other manifestations such as urinary incontinence are less noted and treated inadequately. The prevalence of urinary incontinence in Indian COPD population has not been well documented. The treatment of urinary incontinence includes pelvic floor exercises (Kegel's exercises), biofeedback, and acupuncture etc.

**Methods:** Forty female moderate COPD patients diagnosed according to American Thoracic Criteria with a complaint of urinary incontinence were selected for the study. Pelvic floor therapy exercises were given daily 5 sets per day (1 set =1-3 counts) for seven days. Baseline evaluation was done using International Consultation on Incontinence Short Form (ICIQ-SF) on the day of referral for physiotherapy and the post study measurements were taken on 7th day of hospital stay. Wilcoxon Signed Rank calculator was used to assess the data collected.

**Results:** The z value of ICIQ-SF questionnaire was 5.5109 ( $p \leq 0.05$ ) based on Wilcoxon Sign rank test and it was significant when we compared the pre and post test mean difference. The pre test mean score of ICIQ-SF was 14.175 and post test mean score was 4.4. Based on the findings, the results showed significant improvement in patient symptoms and reduced stress incontinence post pelvic floor therapy exercises.

**Conclusion:** The study emphasizes the importance of pelvic floor therapy in treating stress urinary incontinence among COPD patients and it should also be included in a comprehensive pulmonary rehabilitation program.

**Keywords:** COPD, Kegel Exercises, ICIQ-SF, Wilcoxon Sign Rank test, dyspnea, urinary incontinence

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## INTRODUCTION

Chronic obstructive pulmonary disease is a leading cause of morbidity and mortality worldwide<sup>1</sup>. It is characterized by a progressive airflow limitation with cigarette smoking being the chief etiologic factor. The economic burden of COPD has been increasing more in developing countries like India due to environmental factors and poor living conditions.

The major manifestation of COPD includes dyspnea, decreased oxygenation and reduced exercise tolerance. The other manifestations such as urinary incontinence are less noted and treated inadequately [1]. Urinary incontinence is defined as the involuntary loss of urine during physical exertion such as coughing, laughing etc. The prevalence of urinary incontinence is known to be higher in women than men and increases with age in world population [2]. The prevalence of urinary continence in Indian COPD population has not been documented due to lack of studies. The treatment of urinary continence includes pelvic floor exercises (Kegel's exercises), biofeedback, and acupuncture etc [3,4].

This study investigated the effects of pelvic floor therapy (Kegel's exercises) in women COPD patients admitted in pulmonology ward of Sri Ramakrishna Hospital referred for physiotherapy. There were no previous studies on the effects of pelvic floor therapy to treat urinary incontinence in Indian COPD patients.

## METHODS

Quasi experimental study design method was employed. Forty female moderate COPD patients diagnosed according to American Thoracic Criteria with urinary incontinence were recruited based on the inclusion criteria such as female patients of age group 45 years to 65 years with mild and moderate COPD and complaint of stress urinary incontinence [5,6] Patients with following criteria were excluded such as poor comprehension, very severe COPD patients. The International Consultation on Incontinence Short Form (ICIQ-SF) was used to assess incontinence and to collect demographic details. Informed consent was obtained to participate in the study. Each participant was given a questionnaire before and after the exercises.

### Study Protocol:

Pelvic floor therapy was used to treat incontinence among these patients. Breathing exercises emphasizing diaphragmatic breathing before and after pelvic floor therapy was incorporated for relaxation and endurance. Pelvic floor muscle training was provided individually to the patients by a team of 4 physiotherapists. For all the patients, the treatment started with an explanation of the function of the pelvis and the pelvic floor and about pelvic floor dimension and cause of urinary incontinence in COPD. There is no standardized protocol for teaching pelvic floor exercises [7]. The participants were positioned in supine lying and were asked to tighten to stop her from passing wind or to hold on from passing urine. The patient could feel the tightening of pelvic floor muscles and this should

be repeated for 5 sets per day (1 set =1-3 counts) for 15 minutes each session for seven days. The frequency of the exercise session was 3 times (Morning, Evening Night (before going to bed), per day and it was continued for seven days.

Baseline evaluation was done using International Consultation on Incontinence Short Form (ICIQ-SF) on the day of referral for physiotherapy and the post study measurements were taken on 7<sup>th</sup> day of hospital stay. The International Consultation on Incontinence Short Form (ICIQ-SF) consists of an ordinal data that measures the severity of stress incontinence in the form of questionnaire. It contains 6 scale of items out of which 5 items has scores ranging from 0 to 27.

### Statistical analysis:

Wilcoxon Signed Rank calculator was used to assess the data collected from forty COPD patients. The analysis were done using SPSS 17. An independent physiotherapist not involved in treatment to collect the data on baseline and on 7<sup>th</sup> day. The mean ICIQ-SF score of baseline was 14.175 and it was shown in graph 3.

## RESULTS

### Patient Characteristics

In this study the prevalence of stress urinary incontinence was more in patients with the age group of 45-55. Most of the patients expressed sense of relief from the stress urinary incontinence because of the effective pelvic floor exercise regime. Home advises were given and the handouts on pelvic floor exercise were distributed at the time of discharge from the hospital.

### Reliability and validity

Kelleher (1997) et al tested the ICIQ-SF questionnaire on 293 women patients with stress urinary incontinence and found that the questionnaire was reliable and easy to use [8,9]. They concluded that the questionnaire may be used in different clinical settings.

Based on the Wilcoxon Signed rank test, the results were optimistic emphasizing the importance of pelvic floor therapy in stress incontinence in COPD patients. The distribution of the Wilcoxon W statistic tends to form a normal distribution due to difference in the scores from pre test to post test. The values are tabulated below. The z value is 5.5109 and the p value is 0 and the result is significant at  $p \leq 0.05$

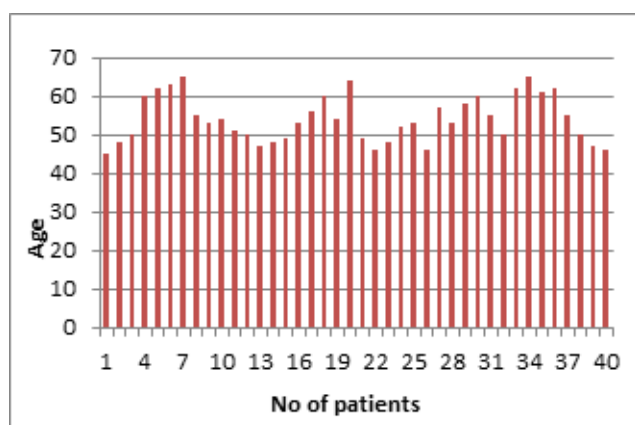
**Table 1:** Baseline Characteristics-Patients data

Characteristic	Value
No of Patients	40
Age (years) Mean (SD)	54(6)

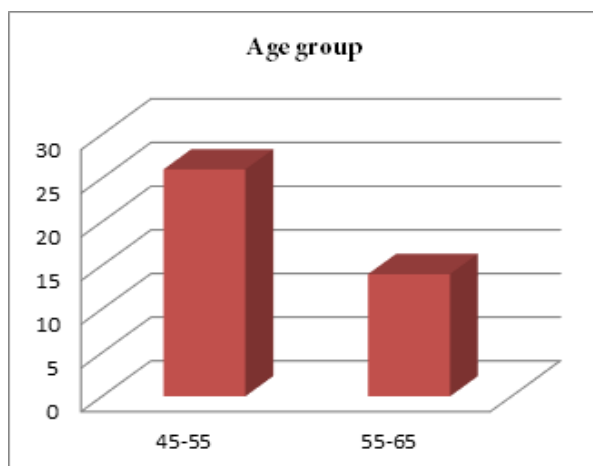
**Table 2:** Wilcoxon Sign Rank test values

Characteristic	Value
W value	0
Mean difference	2.17
Sum of Positive Ranks	820
Sum of Negative Ranks	0
Z value	5.5109 p ≤ 0.05 p value is 0
Mean(W)	410
Standard Deviation(W)	74.4

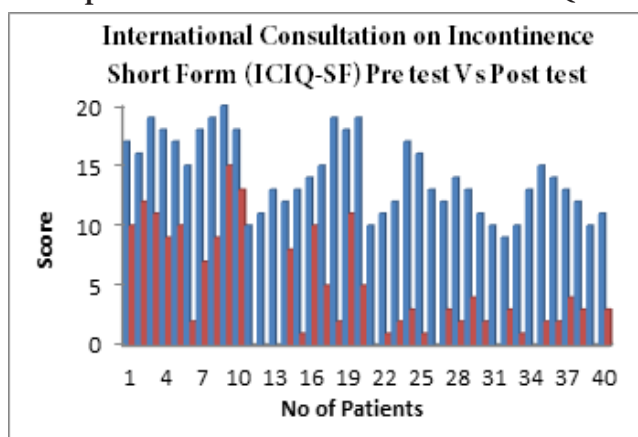
**Graph 1:** No of patients and their ages



**Graph 2:** Age group of the patient



**Graph 3:** Pre test and Post test scores of ICIQ-SF



## DISCUSSION

This study is the first report on the effects of pelvic floor therapy for stress urinary incontinence in women COPD patients. Stress urinary incontinence is a troublesome complication of coughing in women COPD patients now days. Button M et al 2005 stated that the degree of urinary continence was more in chronic cough associated with COPD and cystic fibrosis [10]. The reason for the stress incontinence may be due to increased abdominal pressure because of coughing which causes leakage of urine. It causes impact on social and psychological life of COPD patients. Routine physical therapy management of COPD includes chest physiotherapy, endurance training and a formal pulmonary rehabilitation program. In addition to this pelvic floor exercises should also be included in a routine physical therapy program. Pelvic floor exercises improve the timing of contraction, the strength of the pelvic floor muscles and the stiffness of the pelvic floor muscles.

According to Di Benedetto, Coidessa A, Floris A 2008, the rationale of teaching pelvic floor exercises was that a strong pelvic floor muscle contraction clamp the urethra and it also increases the urethral pressure to prevent leakage during an increase in intra-abdominal pressure [11]. In stress incontinence the pelvic floor muscle exercises inhibit the involuntarily detrusor muscle activity.

Based on the findings in the study, it was evident that the patients were benefited by pelvic floor exercises regime and there was a significant difference in pre and post study scores in ICIQ-SF. The mean pre test and post test score was 14.175 and 4.4 respectively and it was depicted in graph 3. The mean difference showed significant improvements in symptom reduction and the stress incontinence was reduced in 95 % of the patients. Based on our findings the improvements were better in age group 40-50 and the reports of Hay-Smith EJ et al 2006 also supported our findings [12]. They found in their review article that the treatment effect of pelvic floor muscles were significant in 40-50 age group patients. When we compared the results of this study with the other published data, we found that there were no published articles. But there are lots of studies reporting the effectiveness of pelvic floor therapy in stress incontinence in women population due to gynecological disorders.

Nygaard et al 1996 investigated the effects of pelvic floor exercises in treating 71 women patients with urge, stress and mixed urinary incontinence [13]. Their study had been conducted on women patients without any COPD disease. They found that the effectiveness of these exercises were significant in majority of the studied population and concluded that it was inexpensive and easy to use. Our results were also in line with the findings reported by the above article and our participants are also showed significant improvements in terms of well being. The recent study of Kashanina M et al 2011 also proved the effectiveness of pelvic floor therapy in 91 women stress incontinence patients [14]. They postulated that 15 minutes sessions of pelvic floor exercises repeated twice daily for 12 weeks showed

marked improvement in stress incontinence. Our protocols followed these principles of training but no follow-up was made. There were no published studies till date about the effectiveness of pelvic floor therapy in treating stress incontinence in women COPD patients. In accordance with the previous research findings about the effectiveness of the pelvic floor exercise, our study also proved the efficacy of pelvic floor exercises in treating stress incontinence in COPD patients

Several limitations should be taken into account while interpreting the results. In this study the strength of the pelvic floor muscles was not measured before and after the exercise program and there was no control group and long term follow up is also required Information on stress incontinence was acquired from a self report ICIQ-SF questionnaire and other methods of urinary loss were not measured. The ICIQ-SF has good reliability and validity data on measuring the properties of urinary incontinence [15]. The attribute for the poor response of the patients for this clinical problem may be due to lack of education about complications of the disease.

As the disease burden increases due to progression of the symptoms in COPD, proper education and detailed assessment of the urinary incontinence symptoms should be addressed in detail. Collaborative and comprehensive management of this symptom is very essential in treating COPD patients at present.

## CONCLUSION

The study emphasizes the importance of pelvic floor therapy in treating stress urinary incontinence among COPD patients and it also should be included in a comprehensive pulmonary rehabilitation program

### Ethical Committee approval:

This study has been approved by the Institutional review board of College of Physiotherapy SRIPMS Tamilnadu India

### Conflict of Interest:

The author(s) have no conflicts of interest relevant to this article.

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