



EFFECTS OF ACU-TENS, INTERFERENTIAL THERAPY AND EXERCISES ON THE QUALITY OF LIFE IN WOMEN WITH MIXED URINARY INCONTINENCE –AN EXPERIMENTAL STUDY

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ABSTRACT

Objective-Mixed urinary incontinence has a serious impact on the quality of life of patients. The conservative management options are usually advocated as an initial intervention since it carries minimal risk than pharmacological and surgical managements. The effects of Acu-TENS, Interferential therapy and exercises on quality of life in women with mixed urinary incontinence are used on in limited studies hence, this study was designed.

Method-This is a single group prospective experimental study done in the pre-test post-test format at Sri Ramakrishna Hospital, Coimbatore. Informed consent was obtained from all 15 participants before the treatment. To assess the Quality of life Kings Health Questionnaire is used. All the subjects were treated with Acu-TENS, Interferential therapy and exercises. After the 6 weeks of treatment session Quality of life is measured and compared with the statistical analysis.

Result- The mean values, standard deviation and calculated 't' value for the King's Health Questionnaire (KHQ) domains are calculated. The mean value of pretest is (539) is greater than posttest value (292.41).

Conclusion-Data showed the combination therapy using Acu-TENS, Interferential therapy and exercises significantly improved the quality of life of women with mixed urinary incontinence.

1.INTRODUCTION

Urinary incontinence is a common problem with widespread human and social implication causing discomfort, shame and loss of self- confidence. It not only affects the quality of life but also has significant cost complications. Urinary incontinence (UI) commonly classified as the stress urinary incontinence (SUI), if there is any involuntary loss of urine when coughing or sneezing; urge urinary incontinence (UUI), if there is an abrupt and sudden urge to urinate that cannot be postponed and mixed urinary incontinence (MUI) if it is associated with both situation mentioned above.

The International Urogynecological Association (IUA) and International Continence Society (ICS) defined mixed urinary incontinence as “the complaints of involuntary loss of urine associated with urgency and also with the effort or physical exertion or on sneezing and coughing”.

Mixed urinary incontinence has been described urodynamically as “representing both urodynamic stress incontinence and detrusor over activity with or without incontinence”.

Many people have symptoms of both stress incontinence and urge incontinence because; mixed urinary incontinence is the combination of both stress urinary incontinence and urge urinary incontinence. Also mixed urinary incontinence share the causes of both stress urinary incontinence and urge urinary incontinence.

Stress urinary incontinence is commonly seen in pregnancy, after vaginal birth, sneezing, coughing or other factors leads to weakness of muscles that support and control the bladder or increase pressure on the bladder causing urine to leak.

Urge incontinence is caused by involuntary action of the bladder muscles. These may occur because of damage to nerves of the bladder, the nervous system or muscle themselves. Such damage may be caused by certain surgeries or diseases such as multiple sclerosis, parkinson’s disease, diabetes, stroke or injury.

The study of prevalence of urinary incontinence (2013) in Indian women shows that among the total women having incontinence, highest number were found in stress urinary incontinence (60.8%) followed by mixed urinary incontinence (26.8 %) and urge incontinence (12.4 %).

It was seen that prevalence was low in women up to 30 years of age. In women above 30 years of age, the prevalence ranged from 27.8 % to 42.8 % with maximum prevalence in the age group between 40 to 55 years of age.

The prevalence of all type of urinary incontinence was significantly higher in postmenopausal women and women who had hysterectomy. The prevalence of incontinence is maximum among group with the vaginal delivery (26.84 %) followed by women with BMI > 25 (20%), caesarian delivery (10.12%) [This is possible explanation of damage of bladder, either neurologically, muscularly or mechanically during dissection]. More women with mixed urinary incontinence used locally applied estrogen than in stress urinary incontinent women. The women with mixed urinary incontinence more often suffered from chronic constipation than stress urinary incontinence. The frequency of cases with history of radiation because of gynecological cancers was higher in women with mixed urinary incontinence, but the actual numbers were small.

Epidemiological studies show that women with mixed urinary incontinence symptom typically have worse incontinence than do women with stress urinary incontinence and urge urinary incontinence. Treatment for mixed urinary incontinence will require a combination approaches used to relieve both stress urinary incontinence and urge urinary incontinence. The condition often poorly response when treated using either pharmacological or surgical approach.

The practice of the conservative management of mixed urinary incontinence is wide spread and should be encouraged. All modalities appear to be more effective than no therapy. Unlike surgical treatment of urinary incontinence, which carries a significant risk of complication and poor long term outcomes, conservative management is associated with minimal adverse outcome. It includes different modalities and different exercises. Acupuncture, electrical stimulation, Interferential therapy, Acu- TENS, vaginal cones, pelvic floor exercise, abdominal exercises, breathing exercises, bladder training etc. For a significant number of patients, conservative managements are satisfactory as it obviates the need for medical or surgical interventions.

Mixed urinary incontinence has a serious impact on the quality of life of patients. It can also cause anxiety and depression; it influences patient's social interactions and sexual function. The conservative management options are usually advocated as an initial intervention since it carries minimal risk than pharmacological and surgical managements. There are limited studies available on the effects of combination using Acu-TENS, Interferential therapy and exercises for the management of mixed urinary incontinence. Hence, this study was designed.

2. Methods

This study was conducted on out patients in the Department of Physiotherapy, Sri Ramakrishna Hospital, Informed consent was obtained from all patients and all were considered for the study after prior referral from the physician in charge. This is a single group prospective experimental study done in the pre-test post-test format. • People at age group between 35-50 years who had vaginal or caesarean delivery suffering from mixed urinary incontinence are included in this study. Women who have severe pelvic organ prolapse and other organ diseases are excluded also women who were not willing to use modalities and who were unable to complete the questionnaire in English are eliminated.

Initially, seventeen women with mixed urinary incontinence were selected for this study. Informed consent was obtained from all participants. Baseline severity of the symptoms was taken before start of the study in Figure (1.1). Before starting the intervention two of them were withdrawn from this study due to their personal reasons. Remaining 15 participants completed the treatment. Quality of life is measured by King's Health Quality of life Questionnaire (KHQ) before the treatment also participants are arranged with the demographic data Table (1.1). All the subjects were treated with Acu-TENS (Transcutaneous Electrical Nerve stimulation), Interferential therapy and exercises (pelvic floor, transverse abdominus and diaphragmatic breathing exercises.)

Interferential therapy was given with Vectrostim model (Technomed Electronic Private Ltd). Output intensity 0-90mA, frequency channel I 4000 Hz- 4250 Hz, channel II 4000 Hz constant, base 0-100 Hz, Spectrum 0 -150Hz. Patient was positioned in semi-fowlers position. Interferential therapy was given using quadripolar method. Two electrodes were placed on the lower abdomen just above the outer half of the inguinal ligament and another two on the inner aspect of thigh near to the origin of adductor muscle. The parameters used were, intensity up to the tolerable limit of subjects, carrier frequency of 2000Hz, vector 900, rhythmic sweep frequency of 10-100 Hz.

Interferential therapy (IFT) was given for 15 minutes, three times in a week for 6 weeks. Acu-TENS was given with Vectrostim model (Technomed Electronic private Ltd). Subjects were positioned in supine lying and Acu-TENS were given on acupoints CV4, CV6, ST28, ST36, SP36, and KI 3. Then the subjects were re-positioned to prone lying and Acu-TENS were applied on BL23, BL32, BL33, and BL35. The parameters used were, intensity up to the subjective feel tickling sensation, frequency of 10Hz and pulse duration of 200µs.

The Acu-TENS was given for 30 minutes (3 minutes for each 10 acupoints) once in a week for 6 week. All subjects were taught about the anatomy of the pelvic floor and lower urinary tract, physiology and continence mechanism and all were advised to do relaxed breathing, transverse abdominus and pelvic floor exercise at home. This exercise program was accompanied by instruction of the Knack and Quick-flick maneuver. Subjects were asked to maintain the bladder diary and exercise chart. All were taught to contract the pelvic floor correctly and asked to perform 10 repetition of 2-5 seconds contraction, three times a day at home. The rest period was about 10 seconds between each contraction. The subjects were encouraged to use their preferred position initially and then progressed in all functional position. All were advised to perform equally intensive contractions. 3 or 4 fast contractions were then added.

Transverse abdominus exercise also performed in all functional position with relaxed breathing. Subjects were advised

to do 10 repetitions of 5 seconds hold in all positions.

Diaphragmatic breathing exercise was performed in crook lying, sitting, and standing for 10-15 repetitions, once a day. The treatment was given for 6 weeks. After the total intervention participants are assessed and evaluated using same outcome measures. Statistical analysis was done using “Paired t-test” to find out the significant difference on the quality of life in women with mixed urinary incontinence.

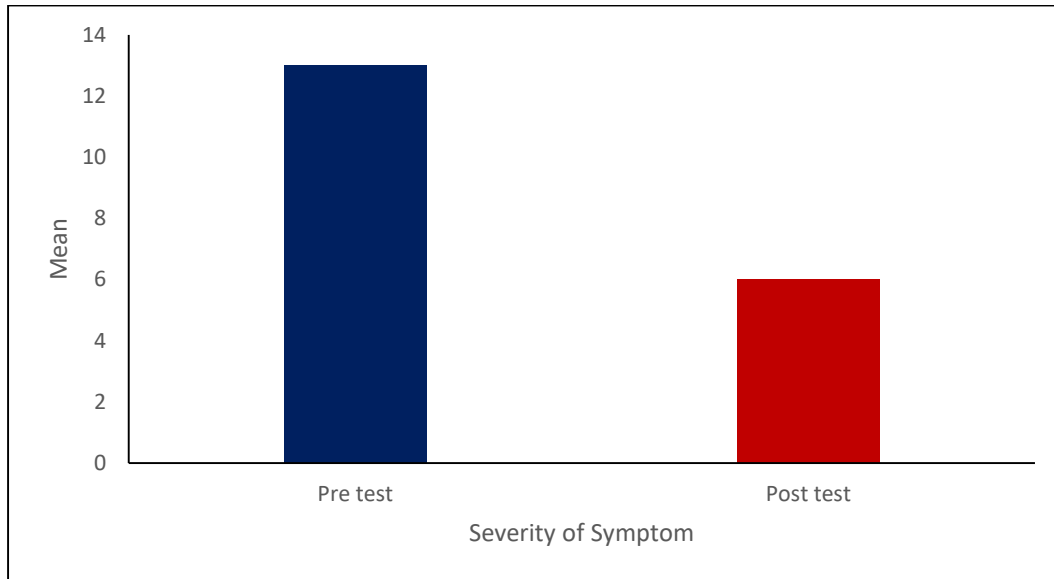


Fig. 1.1: Pre test and Post test mean of symptom severity domain of King’s Health Questionnaire (KHQ)



1.1 Demographic Data

Variables	Minimum	Maximum	Mean, Standard deviation
Age	35	50	39.9±3.5
Weight (kg)	70	97	84.9±7.4
Height (cm)	153	174	162.3±7.9
Body Mass Index (BMI)	30.7	33.8	32.2±0.8



3. Result & Data

The pretest and posttest values was obtained before and after six week of intervention respectively. Significant difference between pretest and posttest value is find out by using Paired “t” test. The mean values, standard deviation and calculated ‘t’ value for the King’s Health Questionnaire (KHQ) domains are shown in table.1.2

1.2: Mean, Standard deviation and ‘t’ value for King’s Health Questionnaire (KHQ) domains

King’s Health Questionnaire Domains (KHQ domains)	Mean, Standard Deviation		‘t’ value
	Pre Test	Post Test	
General Health Perception	66.66 ± 22.49	33.33 ± 22.49	10.57
Incontinence Impact	62.16 ± 17.21	26.64 ± 18.66	15.99
Role Limitation	64.4 ± 18.75	34.41 ± 20.37	16.87
Physical Limitation	62.88 ± 24	32.92 ± 25.12	4.46
Social limitation	35.96 ± 24.14	28.86 ± 18.07	6.10
Personal Relationship	58.85 ± 28.05	28.86 ± 25.56	5.59
Emotions	65.12 ± 25.14	39.96 ± 26.46	16.36
Sleep/Energy	54.4 ± 20.37	28.85 ± 21.31	12.32
Measures of severity	55.52 ± 23.08	35.52 ± 24.87	6.48
Symptom Severity	13 ± 6.25	9.06 ± 5.80	7.82

The first part of the King’s Health Questionnaire dealt with the perception of general health and the impact of the incontinence. The second part of the King Health Questionnaire explored the limitations (role, physical and social), personal relationship, emotions and sleep/ (role, physical and social), personal relationship, emotions and sleep/energy. Third part dealt with the perception of symptom severity. Higher the score indicates poor quality of life. Lower the score indicates the good quality of life.

At the baseline, women with mixed urinary incontinence scored higher in general health perception, incontinence impact, role limitation, physical limitation. The mean and standard deviation for these scores are 66.66±22.49, 62.16±17.21, 64.4±18.75, 62.88±24, 65.12±25.14 respectively.

This indicates that women with mixed urinary incontinence are affected moderate to poorly in the above said domains.

Personal relationship, sleep/energy, measures of severity domains showed mean and standard deviation of 58.85±28.05, 54.4±20.37, 55.52±23.08 respectively. This indicates that women with mixed urinary incontinence are affected moderately in personal relationship, sleep/energy and measures of severity aspect of quality of life.

Social limitation and symptom severity scored the mean and standard deviation of 35.96±24.14, 13±6.25 respectively. This indicates the women are slightly bothered about social limitation and symptom severity since this study was conducted on women who have mixed urinary incontinence for 3 months duration.

After six weeks of treatment using Acu-TENS, Interferential therapy and exercises, women showed greater improvement in all the domains of King's Health Questionnaire. None of the women had adverse effect. The mean and standard deviation of General Health Perception, Incontinence Impact, Role Limitation, Physical Limitation, Social limitation, Personal Relationship, Emotions, Sleep/Energy, Measures of severity, Symptom Severity are 33.3 ± 22.49 , 26.64 ± 18.66 , 34.41 ± 20.37 , 32.92 ± 25.12 , 28.86 ± 18.07 , 28.86 ± 25.56 , 39.96 ± 26.46 , 28.85 ± 21.31 , 35.52 ± 24.87 , 9.06 ± 5.80 respectively. This indicates that women improved more obviously after 6 weeks of treatment in their quality of life.

The calculated 't' value for General Health Perception, Incontinence Impact, Role Limitation, Physical Limitation, Social limitation, Personal Relationship, Emotions, Sleep/Energy, Measures of severity, Symptom Severity are 10.57, 15.99, 16.87, 4.46, 6.10, 5.59, 16.36, 12.32, 6.48, 7.82 respectively at 0.05 level of significance. The calculated 't' value are greater than the table value of 2.145 at 0.05 level of significance. This clearly shows that the combination therapy using Acu-TENS, Interferential therapy and exercises significantly improved the quality of life of women with mixed urinary incontinence.

4. DISCUSSION

Urinary incontinence impact several dimensions of women's life due to either the physiological limitations imposed by the disease or the psychological confrontation resulting from social and family isolation, with consequences on quality of life. It is extremely important to assess the impact and perception of quality of life in women with urinary incontinence. Several studies concluded that women with urinary incontinence often report a decrease in their quality of life (Correia et al., 2009; Lasserre et al., 2009; Bsak et al., 2013).

The King's Health Quality of Life Questionnaire (KHQ) is considered a complete questionnaire that assess both the impact of incontinence in different aspects of quality of life and the lower urinary tract symptoms perceived by the patients.

In our present study, we utilized the combination of Acu-TENS, IFT, and Exercises. Each treatment has its own role in improving the quality of life in women with mixed urinary incontinence.

Transcutaneous electrical nerve stimulation at acupoints combines the advantage of electrical stimulation and acupuncture therapy. In this study Acu-TENS is used to stimulate the specific acupoints related to stomach, spleen, kidney, bladder and conception vessel meridians. Acupoint stimulation affects the nervous system as a whole and causes the release of neuro-chemical messenger molecules, thus results in biochemical changes that influence body's homeostatic mechanism, thus promoting physical and emotional wellbeing (David Bowsher; 1987).

Acu-TENS also brings increased blood flow to the bladder, strengthens the urinary system, controls urethral sphincter, controls the unwanted urinary incontinence symptoms through the inhibition of sensory afferent nerve of bladder, increase bladder capacity and suppresses the detrusor muscle over activity.

Electro-stimulation of the pelvic floor is widely used in the management of female urinary incontinence. The feeling of contraction of the pelvic floor is useful reminder to the pattern of the sensation that should be achieved. IFT has an advantage of more deep stimulation and less discomfort is felt by the subject while stimulating the pelvic floor muscles. Slow and fast twitch muscles are activated using the rhythmic sweep frequency.

Several reports confirmed the effect of pelvic floor exercise on female urinary incontinence. Hatin et al., (1993) found that 71% of patients were cured or improved following pelvic floor exercise. Pelvic floor muscle exercise is thought to help with deferment process by utilizing the perineo-detrusor inhibitory reflex (Mahony et al 1977)

Spasford (2001, 2004) claimed that deep abdominal muscle contraction will make the pelvic floor muscle co-contracted and co-ordination of pelvic floor muscle contraction with deep abdominal muscle contraction is more effective than specific strength training of the pelvic floor muscle to enhance continence. Jones et al (2006) found that both continent women and women with stress urinary incontinence demonstrated co-contraction of the pelvic floor muscle during deep abdominal contractions.

The pelvic floor works in co-ordination with breathing. Holding the breath may increase intraabdominal pressure and thus cause descent stretching and weakness of the pelvic floor muscles.

The result obtained in the present study shows that women with mixed urinary incontinence perceived their overall quality of life as moderate to poor before the treatment. But, after 6 weeks of treatment using combination therapy of Acu-TENS, IFT and exercises, women achieved significantly superior results. The result supported an overall improvement in quality of life. However, small sample size and limited treatment duration are the limitation of the study.

Hence it clear that combined use of Acu-TENS, Interferential therapy and exercises significantly improved the quality of life in women with mixed urinary incontinence.

5.CONCLUSION

Based on this study, it is recommended that Acu-TENS, Interferential therapy and exercises can be used as an effective conservative management to improve quality of life in women with mixed urinary incontinence.

RECOMMENDATIONS

- This study can be done on large sample size.
- Further studies can be done with longer duration.
- In future, studies can be modified with other treatment techniques and parameters.
- Other acupressure points can be included for treating mixed urinary incontinence.
- Further research should be emphasized to find out the effects of other parameters used in Interferential therapy and Acu-TENS.

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