

Impact of pelvic floor muscle training on the quality of life in women with urinary incontinence

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SUMMARY

Objective: To evaluate the impact of pelvic floor muscle (PFM) training on the quality of life (QOL) in women with stress urinary incontinence (SUI). **Methods:** Prospective clinical trial with 36 women with a diagnosis of SUI confirmed by urodynamic study. Women with neuromuscular diseases, using hormone replacement therapy, and with prolapse stage III and IV were not included. The exercise protocol for the PFM consisted of slow contractions (tonic fibers), followed by rapid contractions (phasic fibers) practiced in the supine, sitting, and standing positions, three times a week for a period of three months. We evaluated the impact of PFM on QOL using the King's Health Questionnaire (KHQ), a voiding diary, and digital palpation to assess the function of the PFM during the initial evaluation and after three months of treatment. The result was described as means and standard deviations. We used the Wilcoxon test for comparison of the KHQ scores for paired samples, and the significance level was set at 0.05. **Results:** There was a significant decrease in the mean scores of the domains assessed by the KHQ regarding the perception of health, impact of the incontinence, limitations of daily activities, physical limitations, social limitations, personal relationships, emotions, sleep/disposition, and measures of severity. In agreement with these results, significant decrease in nocturnal urinary frequency and urinary incontinence, as well as significant increase in muscle strength and endurance were observed. **Conclusion:** PFM training resulted in significant improvement in the QOL of women with SUI.

Keywords: Physical therapy modalities; quality of life; stress urinary incontinence; pelvic floor.

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Study conducted at the
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Submitted on: 08/25/2011
Approved on: 12/18/2011

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Conflict of interest: None.

INTRODUCTION

Stress urinary incontinence (SUI) is defined by the International Continence Society (ICS) as the complaint of involuntary loss of urine during exertion, exercise, when sneezing or coughing¹. The risk factors are related to the number of pregnancies, parity, high body mass index (BMI), chronic constipation, postmenopausal status, and chronic cough²⁻⁷. The prevalence of symptoms is 80% in women between 25 and 60 years of age⁸.

Although urinary incontinence (UI) does not represent a direct risk for the affected individuals, there is a consensus on the fact that UI can negatively affect quality of life (QOL) in many aspects, such as the psychological, physical, social, personal, and sexual⁹.

In general, women with UI report physical limitations (playing sports, carrying objects), and changes in social, occupational and domestic activities, which negatively influence the emotional and sexual aspects of life. Moreover, it can cause social and hygienic discomfort, due to the fear of loss of urine, the smell of urine, the need for wearing sanitary pads, and more frequent changes of clothing^{10,11}. Family members and caregivers also experience a negative impact on their QOL, especially regarding the psychological aspects¹².

The assessment of QOL has been shown to be a predictor of treatment-seeking for UI¹³. Among the treatments, the conservative option must be mentioned, which aims to increase the support of the lower urinary tract through increased strength of the pelvic floor muscles (PFMs) and promote urethral closure by involuntary contraction of periurethral muscles. The ICS considers the perineal exercises as the gold standard in SUI, and its efficacy has been demonstrated by randomized controlled trials^{1,14-17}.

Several questionnaires have been developed and tested to measure the impact of UI on the QOL. Among the dimensions studied, the impact on daily life, personal relationships, the psychological and emotional aspects, and the social and physical limitations are important factors measured by these instruments¹⁸.

Recent publications have shown improvement in the QOL of women undergoing conservative treatment, who were evaluated through the King's Health Questionnaire (KHQ)^{19,20}. Therefore, assessment of QOL in women who undergo interventions for the treatment of UI becomes mandatory, as the UI has an impact not only on the QOL of individuals who have it, but also affects the QOL of family members and caregivers. One of the goals of physiotherapy is to investigate and intervene in the impact of incontinence on quality of life of affected women. This study aimed to evaluate the impact of pelvic floor muscle training (PFMT) on the QOL of women with SUI.

METHODS

This is a prospective clinical trial of the before-and-after type, carried out from April 2009 to May 2010. It was conducted at the Outpatient Clinic of Urogynecology and Vaginal Surgery, of the Universidade Federal de São Paulo (UNIFESP/EPM). The Ethics Committee in Research of UNIFESP approved the study – protocol #1966/09. All participants signed an informed consent, drafted in accordance with the National Health Council Resolution number 196/96.

The inclusion criterion for the participant women was a history of SUI without sphincter deficiency during the urodynamic study. Exclusion criteria were neuromuscular diseases, prolapse grade III and IV according to the classification of ICS¹, and use of hormone replacement therapy. At the initial approach, we collected socio-demographic (age) and clinical (body mass index, duration of urinary loss) data as well as obstetric history (parity, vaginal delivery).

Before and after the treatment, the KHQ on quality of life, which has been validated in Brazil, was applied²¹. This is a questionnaire with 30 questions distributed in nine domains: the patients report perception of health, impact of incontinence, task performance limitations, physical limitations, social limitations, personal relationships, emotions, sleep/disposition, and measures of severity. Numerical values are assigned to all answers, added, and evaluated by domain. The KHQ is scored in each of its domains and, therefore, there is no overall score. Scores range from zero to 100, and the higher the score, the worse the quality of life related to that domain. The questionnaire was originally standardized to be self-administered, but it was applied during an interview, and questions were read by the examiner as written.

PFM function was measured by palpation with two fingers. The muscle function was assessed by recording the following variables: power (P), classified by the Oxford scale; and muscular endurance (E), given by the maintenance of muscle contraction in seconds. This evaluation was adapted from the PERFECT method described by Laycock et al.²², widely used in the literature.

Prior to assessment, the patient received instructions regarding the location and function of the PFMs and how to contract them properly: as strongly as possible and eliminating the contraction of the gluteal, abdominal, and adductor muscles as much as possible. The evaluation procedures were explained in detail.

For physical therapy evaluation, patients were instructed to empty the bladder and then were placed in lithotomy position. The resting time was three times greater than the contraction time, and subsequently patients were asked to maintain the contraction for as long as possible.

Urinary loss was measured by the simplified voiding diary, in which the patient wrote down, for a period of seven days, the diurnal and nocturnal urinary frequency and number of urinary leakage events.

The training protocol for the pelvic floor muscles used was described previously by Bo et al.²³. However, in this study, the patients performed the exercises individually. All patients underwent training sessions with a physical therapist specialized in urogynecology. The protocol consisted of exercises to strengthen the pelvic floor muscles, in which women were encouraged to perform three sets of 10 slow contractions (tonic fibers), maintaining each contraction for 6-8 seconds, followed by a resting period equal to the time of contraction maintenance; then, 3-4 fast contractions (phasic fibers), in the supine, sitting and standing positions, for at least three times a week. The treatment was performed for a period of three months.

Data were expressed as means and standard deviations. The scores of the domains of QOL assessment were compared using the Wilcoxon test for paired samples, with a significance level of 0.05.

RESULTS

Initially, 40 women were included in the study. Of these, two patients could not come to the clinic due to work schedule conflicts, and two had to care for sick relatives. A total of 36 women completed the pelvic floor muscle training during the period of April 2009 to May 2010. The mean age of patients was 55.2 (\pm 9.1) years, duration of symptoms was 7.0 (\pm 6.6) years, and body mass index was 28.9 (\pm 5.2) (kg/m^2).

Regarding the obstetric history, three women were nulliparous, 24 had between one and three pregnancies, nine had four or more pregnancies, with an average of 3.1 (\pm 2.1) pregnancies. As for the type of delivery, 22 women had one to three vaginal deliveries, and seven women had four or more vaginal deliveries, with an average of 2.5 (\pm 2.2) deliveries.

There was a significant decrease in mean scores in all domains assessed by the KHQ (Table 1). In accordance with the results of the QOL assessment, decreased urinary loss and nocturnal urinary frequency were observed by patients, both symptoms assessed by the daily voiding diary (Table 2). A significant increase in muscle strength and endurance was also observed (Table 3).

Table 1 – Comparison of scores of quality of life, according to the domains of Kings Health Questionnaire (KHQ), before and after treatment

KHQ domains	Before	After	Sig. (p)
Perception of health	40.9 (\pm 22.4)	29.8 (\pm 22.2)	0.011
Impact of incontinence	52.7 (\pm 35.0)	18.5 (\pm 18.5)	< 0.001
Limitation of daily activities	42.1 (\pm 27.4)	14.8 (\pm 19.0)	< 0.001
Physical limitations	41.6 (\pm 30.7)	20.3 (\pm 26.1)	< 0.001
Social limitations	20.8 (\pm 24.4)	4.9 (\pm 9.6)	< 0.001
Personal relationships	11.1 (\pm 21.3)	7.9 (\pm 18.7)	0.024
Emotions	31.4 (\pm 30.6)	13.2 (\pm 23.1)	< 0.001
Sleep/disposition	26.3 (\pm 30.7)	10.6 (\pm 16.0)	0.003
Measures of severity	43.2 (\pm 28.0)	20.3 (\pm 19.4)	< 0.001

Table 2 – Comparison of urinary symptoms, before and after treatment

Urinary diary (7 days)	Before	After	Sig. (p)
Daytime urinary frequency	6.8 (\pm 1.9)	6.7 (\pm 1.8)	1.000
Nighttime urinary frequency	1.7 (\pm 1.4)	1.2 (\pm 1.2)	0.012
Urinary incontinence	1.3 (\pm 1.3)	0.5 (\pm 0.7)	0.001

Table 3 – Comparison of pelvic floor muscle (PFM) function before and after treatment

PFM function	Before	After	Sig. (p)
<i>Oxford</i>	2.0 (\pm 0.9)	3.5 (\pm 1.0)	0.000
<i>Endurance</i>	3.0 (\pm 1.7)	6.6 (\pm 2.4)	0.000

DISCUSSION

The effects of the PFMT have been widely described in literature in more than 50 randomized clinical trials. It is considered the gold standard for the treatment of SUI, with level of evidence A²⁴. Additionally, this treatment also results in the improvement of patient's perception of the disease, and in the decrease in the impact on their QOL. When measured with precision and reliability, the assessment about the severity and impact of the disease is an important parameter for the assessment and treatment of affected patients. Although subjective, these data are significantly relevant, as they indirectly reflect the quality of care provided.

In this study, the measurement of pelvic floor muscle function was performed by palpation with two fingers, a validated and widely used technique in the literature^{22,25,26}. Prior to treatment, a mean score at the Oxford scale of 2.0 (\pm 0.9), which is considered weak muscle function, was observed. Moen et al.²⁷ suggest that, for the pelvic floor muscle function to be adequate, the value assessed by the Oxford scale must be \geq 3. In this study, after three months of treatment, a mean of 3.5 (\pm 1.0) was observed, which is considered effective. Muscular endurance progressed positively from 3.0 (\pm 1.7) to 6.6 (\pm 2.4) seconds. The improvement can be attributed to the quality of the instituted protocol, which recommended a maintenance time of 6 to 8 seconds²⁷.

The improved pelvic floor muscle function and QOL were associated with improvement in urinary incontinence. In this study, a decrease in urinary loss events from 1.3 (\pm 1.3) to 0.5 (\pm 0.7) was observed. In a recent publication, the voiding diary was considered an important tool for the objective measurement of urinary loss, with good correlation with the patients' reports on their symptoms²⁸.

Similarly to this study, Rett et al.²⁹ recruited 26 women with SUI, with a mean age of 42 years (\pm 5.5), and used PFMT associated with biofeedback. After the treatment, improvement was observed in eight of the nine domains assessed by the KHQ. Only the domain regarding personal relationships was not different after the treatment. However, the authors suggest that this domain may be related to aspects of family and sex life, and among the women studied, many of them may not have reported to the family about the problem of urinary loss, or were not sexually active²⁹.

In another recent study by Fozzati et al.²⁵, 26 women with a mean age of 50 years were selected and treated using the global postural reeducation (GPR) technique. After the treatment, the authors observed an improvement in the areas of general health perception, incontinence impact, and SUI symptoms ($p < 0.05$). Three and six months after the end of treatment, these results

persisted. For the authors, the benefits of improved QOL in the short- and mid-term may be related to modifications in the body schema, and improvement in body self-knowledge, which reduces structural overload; these factors can result in pelvic floor protection²⁵.

Literature demonstrates that PFMT, when performed regularly, can improve pelvic floor muscle function²⁴. Due to this factor, it is believed that the improved functionality can be directly associated with a decrease in the number of urinary leakage events, and consequently improve QOL for these women.

It is worth emphasizing the importance of using a properly translated questionnaire that has been adapted to Brazilian Portuguese, with high reliability and validity, which may be included in any Brazilian study on urinary incontinence and in clinical practice²¹.

One of the limitations of this study was the lack of detail in the frequency of exercises through the use of a daily record. Additionally, it lacked a comparison between the data from the present study and a control group. Finally, suggestions for further studies including the reevaluation of patients after a period of time to verify the maintenance of the results should be considered for researchers in this field.

CONCLUSION

Based on the results of the study, pelvic floor muscle training resulted in significant improvement in the QOL of women with SUI.

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