

Physical therapy intervention in women with urinary incontinence associated with pelvic organ prolapse

Intervenção fisioterapêutica em mulheres com incontinência urinária associada ao prolapso de órgão pélvico

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Abstract

Background: Urinary incontinence (UI) is a prevalent condition that affects women of all ages. Pelvic organ prolapse in conjunction with UI is a common occurrence. **Objective:** To assess the effect of pelvic prolapse on the outcome of physical therapy treatment for women with UI. **Methods:** The study included 48 women aged between 35 and 78 years who underwent anamnesis and measurement of pelvic floor strength (bi-digital test and perineometry). The physical therapy intervention consisted of transvaginal electrical stimulation and pelvic floor exercise for up to 15 weekly sessions. **Results:** The majority of the women had normal delivery and 2.6±1.5 children (range=0-7). Pelvic prolapse was observed in 72.4% of the women who had normal delivery, in 100% of those who had cesarean section, and in 77.8% of those who had both normal and cesarean deliveries. 48% of the women had mixed UI, 39.5% had stress UI, and 12.5% had urge UI. The duration of symptoms varied from 2 to 28 years (7.9±5.3). In the participants with and without prolapse, a significant difference was observed in the pre- and post-treatment comparisons for the pelvic floor muscles. The pre- and post-treatment perineometry showed a significant increase only in the women with prolapse (p=0.048). 87.5% of the participants became continent. **Conclusions:** The physical therapy treatment was effective in treating and/or curing the symptoms of UI, whether or not associated with pelvic prolapse, regardless of the clinical type of incontinence. Clinical Trial Registration (Brazilian Clinical Trial Registry): RBR-3p5s66.

Keywords: urinary incontinence; prolapsed; physical therapy.

Resumo

Contextualização: A incontinência urinária (IU) é um sintoma comum que afeta mulheres de todas as idades. A ocorrência de prolapso de órgão pélvico concomitante à IU é muito comum. **Objetivo:** Avaliar o efeito da presença de prolapso pélvico no resultado de tratamento fisioterapêutico de mulheres com IU. **Métodos:** Participaram do estudo 48 mulheres com idades entre 35 e 78 anos, as quais foram submetidas a anamnese e avaliação da força de contração do assoalho pélvico (teste bidigital e perineometria). A intervenção fisioterapêutica consistiu em eletroestimulação transvaginal e cinesioterapia (até 15 sessões semanais). **Resultados:** A maioria das mulheres realizou parto normal (29/46) e teve 2,6±1,5 filhos (de 0 a 7). Apresentaram prolapso pélvico 72,4% das mulheres que realizaram parto normal, 100% das que realizaram cesárea e 77,8% das que realizaram parto normal e cesárea. 48% das mulheres tinham IU mista; 39,5%, IU de esforço e 12,5%; IU de urgência. O tempo de duração dos sintomas variou de dois a 28 anos (7,9±5,3). Detectou-se diferença estatística significativa nas comparações pré e pós- tratamento para os músculos do assoalho pélvico, tanto para o grupo de pacientes sem prolapso como para o grupo com. A perineometria pré e pós apresentou diferença estatística significativa apenas nas pacientes com prolapso (p=0,048). 87,5% das participantes ficaram continentas. **Conclusões:** O tratamento fisioterapêutico realizado foi eficaz para tratar e/ou curar os sintomas de IU associada ou não ao prolapso pélvico, independente do tipo clínico da incontinência. Registro de Ensaios Clínicos (Registro Brasileiro de Ensaios Clínicos): RBR-3p5s66.

Palavras-chave: incontinência urinária; prolapso; fisioterapia.

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Introduction

The International Continence Society establishes that Urinary Incontinence (UI) is the involuntary loss of urine, which constitutes social and hygienic discomfort and which can be demonstrated objectively¹. UI is a common condition that affects women of all ages and can seriously interfere in the physical, psychological, and social well-being of the affected individuals^{1,2}. Its prevalence is greater in females due to anatomical factors and increasing age (8-34% in older adults), often being wrongly interpreted as a natural part of the aging process³.

It is classified as: (1) stress UI (SUI), the most prevalent form (55%) characterized by loss during physical strain without contraction of the detrusor muscle; (2) urge UI (UII) that occurs when the patient feels a sudden and strong desire to void, but is not able to control the mechanism of urination; and (3) mixed UI (MUI), which is the combination of SUI and UII^{4,5}.

A very common concomitant of UI is pelvic organ prolapse⁶, estimated to affect 41 to 65% of women⁷. Genital prolapse originates from the imbalance of the forces responsible for maintaining normal positioning of the pelvic organs⁸ and those who usually prevent them extruding from the pelvis. Prolapse is more common in multiparous women and older women due to estrogen deficiency and aging, leading to relaxation of the pelvic floor structures and subsequent inability to maintain the normal positioning of the pelvic organ⁶.

Urinary function can be reproduced and assessed with a urodynamic study, a test that is considered to be the gold standard but also expensive. The degree of pelvic floor muscle strength generally has a positive relationship with the level of continence and can be measured by perineometry and bi-digital palpation, which are used routinely due to the simplicity of application, low cost, good technical reliability, and good acceptability by women^{6,7}.

The conservative treatment of UI is justified if the symptoms are mild¹ because it can cure or improve many symptoms, making surgery unnecessary in these cases^{1,9}. The choice for conservative treatment is also favored by the fact that surgical treatment is not effective in all cases, and relapse of symptoms can occur within five years of surgery¹⁰.

Among the modes of conservative treatment are drug and physical therapy treatment. The resources used in physical therapy include exercises for the pelvic floor muscles (PFM) and endovaginal electrostimulation¹. Exercise is the preferred therapy^{9,11} because it offers a less invasive option with low risk of complications⁹.

According to Amaro, Gameiro e Padovani¹², the use of perineal electrical stimulation is essential to promote the

recovery of an absent or deficient voluntary command, helping the patients to become aware of the action of the perineal muscles¹². It is recommended primarily for women with muscle function lower than or equal to three in the Oxford or Ortiz scales (0-5) until active contraction is achieved^{13,14}.

It is known that parity influences the development and/or the severity of UI¹⁵. However, the role of prolapse in UI is still unclear and it is not known whether it influences the outcomes of physical therapy treatment for UI. Therefore, the aim of the present study was to assess the effect of the presence of genital prolapse on the physical therapy treatment of UI in women. The specific objectives were to measure PFM function in women with UI, with and without genital prolapse; to compare PFM function values of women with prolapse to those of women without prolapse before and after a program of physical therapy treatment; to establish the number of sessions of physical therapy treatment needed to improve urinary loss among women with UI, with and without genital prolapse; to find out which of the three types of UI is the most prevalent in women with and without genital prolapse; and to compare PFM function in the women grouped according to type of UI.

Methods

This was a quasi-experimental before-and-after study that was part of a larger study entitled "The influence of physiotherapy intervention on quality of life in patients with urinary incontinence". It was conducted between June 2006 and November 2008 at the Physical Therapy Sector of Hospital São Lucas of Pontifícia Universidade Católica do Rio Grande do Sul (HSL-PUCRS), Porto Alegre, RS, Brazil. This study was approved by the Research Ethics Committee of PUCRS (number 06/03194). Ethical principles were respected pursuant to CNS-MS Resolution 196/96¹⁶. All participants signed an informed consent form.

The study included 48 women (35 to 78 years old) from greater Porto Alegre and the interior of the state of Rio Grande do Sul. All of the women referred to the Physical Therapy Sector by the outpatient urogynecology clinic of HSL with medical diagnosis of clinical UI were included, regardless of type (stress, urge or mixed).

Participants were excluded if, during the study period, they performed any type of additional physical therapy treatment or began any type of structured physical activity in addition to those foreseen in this protocol. Other exclusion criteria were pathologies that could promote further disabilities, such as: severe lung diseases, neurological diseases, oncological diseases, severe heart disease or corrective surgery for UI.

The participants were evaluated before and after physical therapy treatment through anamnesis and measures of PFM function (perineometry and bi-digital test). The evaluation had average duration of 30 minutes, including 10 minutes to assess muscle function. Only the perineometry and the bi-digital test were repeated at the end of treatment.

In the anamnesis, data were collected on UI type, duration of symptoms, age, parity, type of delivery, number of deliveries and children, presence of constipation, and prolapse. The information obtained from the patients was checked against the data on their medical records.

The objective evaluation of PFM function was made using a digital perineometer (Kroman - T.I.U. - 40 KG, São Paulo, SP), with a pressure sensor that ranges from 0 to 1.64 cmH₂O (lowest normal value according to manufacturer: 0.49 cmH₂O). The sensor was inserted into the vaginal canal, while the participant remained in supine position with semiflexed knees. The participants were requested to perform three consecutive maximum contractions, and the highest value was used as a reference. The original unit of measurement supplied by the equipment (Sauers) was converted into its equivalent in cmH₂O.

The subjective evaluation of PFM function was performed with the bi-digital test, through transvaginal digital palpation, with the participant in supine position with semiflexed knees. The function of the PFM (levator ani muscle and bulbospongiosus muscle) was assessed against the fingers of the examiner according to the Ortiz Scale (0-5), which classifies function as: grade zero – no objective perineal function even with palpation; grade one – absent, recognized only with palpation; grade two – weak, recognized with palpation; grade three – objective function present and without resistance to palpation; grade four – objective function present and opposing resistance to palpation maintained for less than five seconds; grade five – objective function present and opposing resistance to palpation maintained for more than five seconds¹⁴.

After being evaluated, women were subjected to physical therapy treatment with exercise (15 minutes) and perineal electrical stimulation (10 minutes), in a single session per week, for a maximum of 15 weeks. As soon as the patients reported continence or at the end of 15 sessions, they were re-evaluated by the same examiner.

The exercise consisted of pelvic floor activation with the aid of ball and elastic band. The exercises were: pelvic bridge in dorsal decubitus, abduction and adduction of the hip with the patient in the dorsal decubitus position and, then, sitting. All exercises involved isotonic and isometric contractions maintained for 6 seconds, with a series of ten repetitions for each type of exercise, therefore, two sets of each exercise were performed.

The electrotherapy was performed with a device (Dualpex 961 URO QUARK, Piracicaba, SP) connected to an electrode introduced into the vagina with intensity adjusted according to the participant's tolerance, peaking at a maximum current of 60 mA, for 10 minutes. The parameters of the electric current varied according to the type of UI: for UUI, heterodyne frequency of 2 K/10 Hz; for SUI, Kots current of 2 K/50 Hz, sustaining time=6 s, resting time=2 x sustaining time and rise of 100 µs; and for MUI, alternating frequencies of 10 Hz and 50 Hz, e.g. 10 Hz one week and 50 Hz the following week^{17,18}.

Data were entered into the database twice to eliminate typing errors. The statistical analysis was performed using SPSS, version 13.0. Statistical significance for all analyses was set at $p < 0.05$. The data were tested for normality (Shapiro-Wilk test).

The presence of prolapse was compared with the number of normal deliveries using Fisher's Exact test and with the medical diagnosis of UI using Pearson's chi-square test. Women were divided into two groups (with and without prolapse) and compared in terms of total number of sessions (Mann-Whitney), PFM function measured by perineometer (Wilcoxon test) and by the bi-digital test (Wilcoxon test). The results obtained with the perineometer (pre- and post-treatment) were compared across the categories of medical diagnosis (SUI, UUI, and MUI) using the ANOVA test, whereas the bi-digital test results were compared using the Kruskal-Wallis test.

Results : : : .

The characteristics of the sample are shown in Table 1. Among the 48 participants evaluated, most were middle aged (53.8 ± 10.9 years), married women with incomplete elementary education and non-residents of the city of Porto Alegre. The number of children for the total group ranged from 0 to 7 (2.6 ± 1.5).

The duration of UI symptoms varied from two to 28 years (7.9 ± 5.3), with 75% of participants having duration of UI ≤ 10 years and 25% having duration of UI > 10 years (Table 1). There were two nulliparous and 46 multiparous (95.8%) women, the majority of which had normal deliveries (29/46). Pelvic prolapse was found in 72.4% of the women who had normal delivery, 100% of those who had cesarean section, and 77.8% of those who had normal and cesarean deliveries.

In the comparison between the presence of prolapse and the number of normal deliveries, no significant association was detected ($p < 0.05$; Fisher's Exact Test). Among the participants who had one or two deliveries, 73.9% had prolapse, and among

the participants with three or more deliveries, 73.3% had prolapse. In the comparison between prolapse and the number of caesarean deliveries, no significant association was detected.

In our study, 23 women had a clinical diagnosis of MUI (48%); 19 women had SUI (39.5%), and six women had UUI (12.5%). No significant association was detected between the presence of prolapse and the medical diagnosis of UI. However, the results showed prolapse in 84.2% of the participants with SUI, 69.6% of the participants with MUI, and 66.7% of the participants with UUI.

When comparing the type of delivery with the clinical diagnosis of UI, a significant association was found with SUI ($p=0.05$) and a tendency of association between not having caesarean section and UUI and MUI. According to the percentage distribution observed, 83.3% of the participants who had a caesarean section had SUI. Among the participants not submitted to caesarean section, 5.0% had MUI and 10% UUI. Among those who had normal delivery, 58.6% had a diagnosis of MUI.

Table 1 shows the percentages of patients who had episiotomy (68.4%), constipation (37.5%), and obesity (39%), and who undertook physical activity (39%). The total number of sessions ranged from eight to 15 (13.5 ± 2.2), and no significant statistical difference was detected ($p=0.311$; Table 1) between the group with prolapse ($n=36$) and without prolapse ($n=12$).

With regard to the result of the treatment, of the total of 48 women, 42 (87.5%) were continent, 6.3% reported improvement, and 6.3% were dissatisfied. Only one patient had grade 3 posterior prolapse and was satisfied (continent) after 15 sessions.

In the pre- and post-treatment comparison of PFM function measured by the perineometer (Table 2), no significant difference was found in the participants without prolapse ($p=0.136$). However, in the participants with prolapse, there was a significant increase in muscle function post-treatment ($p=0.048$).

After physical therapy treatment, the results showed significantly higher values for PFM function compared to pre-treatment in both groups (Table 2). It must be pointed out that, in the comparisons of the group with prolapse, the differences were greater than in the group without prolapse. No significant difference was detected between the means of the three categories of medical diagnosis (SUI, UUI, and MUI) obtained by perineometer and the bi-digital test pre- and post-treatment.

Discussion

Patients with UI still delay seeking help for their condition¹⁹. In the present study, the symptoms lasted nearly eight

Table 1. Sample characteristics.

Variables	
Age (years)	53.8±10.9
Duration of UI (years)	7.9±5.3
Parity*	
Nulliparous	2 (4.2%)
Multiparous	46 (95.8%)
Type of delivery*	
Vaginal	29 (63%)
Caesarean section	6 (13%)
Vaginal and caesarean	9 (19.6%)
Number of children*	2.6±1.5 (0-7)
Episiotomy*	26 (68.4%)
Constipation*	18 (37.5%)
Physical activity*	16 (38.1%)
Number of sessions [§]	
Total**	13.5±2.2 (8-15)
Without prolapse [§]	14±1.5
With prolapse [§]	13.2±2.3
Treatment results	
Satisfied	42 (87.5%)
Improved	3 (6.3%)
Did not improve	3 (6.3%)

UI = urinary incontinence; * data presented as sample size and percentage – n(%); ** data presented as mean±standard deviation (minimum-maximum); [§] the number of sessions was similar in the sample for women with and without prolapse.

Table 2. Comparison of pelvic floor muscle strength in women with and without pelvic organ prolapse measured with perineometer and bi-digital test before (pre; mean±standard deviation) and after (post; mean±standard deviation) a physical therapy intervention.

Group	Pre (n=48)	Post (n=48)	p*
Perineometer (cmH ₂ O)			
With prolapse	0.76±0.42	0.82±0.44	0.048
Without prolapse	0.64±0.53	0.69±0.49	0.136
Bi-digital test LAM			
With prolapse	3.91±0.95	4.52±0.79	0.009
Without prolapse	3.33±1.61	4.17±1.11	0.031
Bi-digital test BM			
With prolapse	3.70±1.02	4.52±0.59	0.001
Without prolapse	3.08±1.56	3.92±1.16	0.015

* Wilcoxon test; LAM = levator ani muscle; BM = bulbospongiosus muscle.

years before the participants sought help or heard about treatment. Perhaps this delay is due to the fact that the most prevalent type of UI was mild and moderate and women with this degree of incontinence often do not seek help¹ and/or the fact that many women are unaware that UI can be treated, considering it a natural result of delivery and the aging process^{20,21}. UI can arise during pregnancy but is usually related to pelvic floor neuromuscular damage during vaginal delivery, mainly in first-time mothers^{5,15}.

In the present study, the results confirmed that multiparous women who had vaginal delivery are more likely to have decreased PFM function leading to female UI^{5,14,22} despite good contraction function, as reported by Isherwood and Rane⁵. According to these authors, the most common type of UI is SUI. In our study sample, MUI had a prevalence of 48%. However, when we compared the type of UI with the presence of pelvic prolapse, 84.2% of participants had SUI, which agrees with the findings of Marinkovic and Stanton⁶ who found a strong association between mild or moderate prolapse and SUI. In another study conducted with 330 patients with various degrees of cystocele (grade 1 to 4), there were also cases of mild or moderate prolapse associated with SUI²³.

Vaginal delivery was considered prognostic of all three types of incontinence²⁴. In this study, there was a predominance of MUI among the participants who had normal delivery, while those who have been submitted to cesarean section had significant association with the diagnosis of SUI.

Menta and Schirmer¹⁵ recommend encouraging normal delivery with selective use of episiotomy. However, perineal protection is not always guaranteed by the surgical incision because of the difficult recovery of the muscles incised. In the present study, 68.4% of the participants had episiotomy and still developed UI, confirming the findings of Menta and Schirmer¹⁵.

Constipation is a common complaint that can stimulate receptors in the bladder and subsequently reduce its contractility, leading to incomplete voiding⁶. The results obtained by Sobhgol and Charandabee²⁴ indicate that the risk for all types of UI increased with constipation²⁴. In the present study, more than one third of the participants (37.5%) reported constipation.

Dannecker et al.⁹ found a significant and long-lasting therapeutic effect after PFM training, in contrast to the findings of other authors, who reported cure rates in the long run of only 17% for UI surgery⁴. Dannecker et al.⁹ achieved a high level of self-reported improvement (94%) and improved satisfaction of the patients with the therapeutic outcome. After three years, 71% of 390 women still reported a lasting improvement of the symptoms of UI⁹. As with any type of muscle training, however, gains must be maintained with regular exercise such as the weekly training used in the present study.

Amaro, Gameiro, and Padovani²² evaluated PFM strength with the perineometer and found a significant increase after the treatment used. In our study, this increase was only significant in the group with prolapse. Dannecker et al.⁹ measured PFM function using vaginal digital palpation and the Oxford Grading Scale and found a considerable increase in muscle function after exercise training, which was shown to be effective even in women with severe UI. Vaginal digital

palpation is the method most used to assess the function of the perineal muscles²⁵.

According to Bø, Talseth and Holme²⁶, exercises are more effective than electrical stimulation, vaginal cones or no treatment in women with SUI. In contrast, Castro et al.²⁷ claim that these three different modes of therapy are equally effective for UUI and SUI. In the present study, the combination of exercise and electrical stimulation was shown to be effective as most of the participants reported being continent at the end of the treatment. This high resolution rate was also reported by Ghroubi et al.²³ in a study with 47 patients with UI associated with grade 1 or 2 prolapse who received training in perineal muscle awareness (palpation and biofeedback) and electrical stimulation. The authors demonstrated that conservative treatment can be effective in these patients through the improvement of clinical symptoms and urodynamic parameters²³.

The participants in the present study needed an average of 13 treatment sessions to achieve continence. These results are similar to those of Lorenzo Gómez et al.²⁸, who conducted a treatment program with perineal reeducation through Kegel exercises and vaginal electrical stimulation with twice-weekly sessions for a maximum period of ten weeks. The authors observed that 71.42% of the patients had improved by the fourth week, and 80% of them had improved by the tenth week of the program. Just as Lorenzo Gómez et al.²⁸ showed improvement of UI symptoms with less than half the number of treatment sessions used in the present study, Pena Outeiriño et al.²⁹ found improvement in women (n=72) with low PMF tone or inability to understand the mechanics of perineal contraction after six 20-minute sessions of electrical stimulation with biphasic currents. However, the rate of improvement reported by the authors (66%) was lower than that of the present study (87.5%). Arruda and Girão³⁰ also found similar results in 29 women with bladder instability who received vaginal electrical stimulation in twice-weekly sessions of 20 minutes for a period of three consecutive months and, after treatment, 75.85% were cured or showed improvement³⁰.

Based on the present study results, we can conclude that women with UI, regardless of the presence of prolapse or the type of incontinence, do not differ significantly in terms of muscle function and response to treatment. All participants responded positively to the treatment after a similar number of sessions, showing increased PFM function despite the frequency of only one session a week due to the distance to the treatment facility and socioeconomic factors. Therefore, electrotherapy combined with exercise is effective in treating and/or curing the symptoms of UI, whether or not associated with pelvic prolapse and regardless of the type of clinical incontinence.

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