Analysis of the resources for rehabilitation of pelvic floor muscles in women with prolapse and urinary incontinence

Análise dos recursos para reabilitação da musculatura do assoalho pélvico em mulheres com prolapso e incontinência urinária

Análisis de los recursos para rehabilitación de la musculatura del suelo pélvico en mujeres con prolapso e incontinencia urinaria

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ABSTRACT | This review aimed to assess the capabilities and effectiveness of pelvic floor rehabilitation in the treatment of genital prolapse and urinary incontinence. The research was conducted in MEDLINE/PubMed, LILACS/SciELO and Cochrane Library. There were found 886 articles, of which were used 34 relevant clinical trials that answered the questions constructed by the authors. The studies analyzed showed that pelvic floor training can be used in prolapse treatment, but further randomized studies are necessary to support this evidence. For urinary incontinence pelvic floor, rehabilitation is effective and should be the treatment of first choice.

Keywords | rehabilitation; pelvic floor; women; prolapse; urinary incontinence.

RESUMO | Esta revisão teve como objetivo analisar os recursos e sua eficácia na reabilitação do assoalho pélvico no tratamento dos prolapsos genitais e incontinência urinária. As buscas foram realizadas nas bases de dados MEDLINE/PubMed, LILACS/SciELO e Biblioteca Cochrane. Foram encontrados 886 artigos, dos quais foram utilizados 34 estudos clínicos relevantes que respondiam às perguntas construídas pelos autores. Os estudos analisados mostraram que o treinamento do assoalho pélvico pode ser usado no tratamento dos prolapsos, porém são necessários mais estudos randomizados para sustentar essa evidência. Para a incontinência urinária a reabilitação do assoalho pélvico é eficiente e deve ser o tratamento de primeira escolha.

Descritores | reabilitação; diafragma da pelve; mulheres; prolapso; incontinência urinária.

RESUMEN | Esta revisión tiene como objetivo analizar los recursos y su eficacia en la rehabilitación del suelo pélvico en el tratamiento de los prolapsos genitales y la incontinencia urinaria. Las búsquedas fueron realizadas en las bases de datos Medline/Pubmed, LILACS/SciELO y Cochrane. Fueron encontrados 886 artículos, de los cuales fueron utilizados 34 estudios clínicos relevantes y que respondían las preguntas construidas por los autores. Los estudios analizados mostraron que el entrenamiento del suelo pélvico puede ser usado en el tratamiento de los prolapsos, sin embargo, son necesarios más estudios randomizados para sustentar esta evidencia. Para la incontinencia urinaria la rehabilitación del suelo pélvico es eficiente y debe ser el tratamiento de primera opción.

Palabras clave | rehabilitación; suelo pélvico; mujeres; prolapso; incontinencia urinaria.

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INTRODUCTION

Urinary incontinence (UI) and pelvic organ prolapse (POP) are pelvic floor (PF) disorders that may occur alone or in association, and are caused by dysfunctions in ligaments, fascia and pelvic floor muscles (PFM)[1].

UI is a very prevalent symptom in the general population. Studies show increasing rates during the young adult age and prevalence from 30 to 50% in patients older than 60 years old[2]. The POP is also relatively common, and it may affect about 40% of the women, especially those with more advanced age, as well as multiparous and white women[3]. The demand for health services specialized in PF dysfunctions should grow significantly in the next decades, since the relative proportion of elderly increases and, consequently, also does the incidence of these dysfunctions[4].

PF dysfunctions are not conditions that threaten life, but they cause important morbidity. They can intensively affect the quality of life (QOL) of patients, leading to physical, social, occupational and sexual limitations[5].

Pelvic floor muscle exercises (PFME) were established by Arnold Kegel, in 1948[6]. Since the pathogenesis of the dysfunctions begins with the loss of PF muscle support, training these muscles has proven to be effective[7]. Individual instruction and making sure that the patient is properly contracting the muscles are essential before the beginning of the treatment, since around 30% of the women are not able to contract the PFM at the first evaluation[8].

With the progress in research concerning the physiology of the lower urinary tract and with the improvement of diagnostic techniques, physical therapy has achieved an important role in the rehabilitation of patients. Its objectives include increasing the resistance of PFM, preventing the evolution of POP, reducing the frequency or severity of urinary symptoms and preventing or slowing down the need for surgery[9]. The approach is minimally invasive and practically has no adverse effects. Success depends on the motivation and effort both from the patient and the involved multidisciplinary team[10].

This review article aimed to analyze the resources and their efficacy in the rehabilitation of the PV in the treatment of POP and UI, which can assist doctors in the indication of rehabilitation and physical therapists to guide the treatment.

METHODOLOGY

Each item in this article was built according to seven clinically relevant questions created by the authors: is PF training efficient in the treatment of POP? Does physical therapy, which is used as an adjuvant method, help the treatment of the prolapse? Is PF training in UI more efficient when conducted individually or in groups? Is PF training in UI more efficient when supervised or unsupervised? Which training parameters should be used in PF rehabilitation? How are the PFM rehabilitation and the Paula Method results performed? Which other resources are used by physical therapy to rehabilitate the PFM?

The searches were conducted in MEDLINE/PubMed, LILACS/SciELO and the Cochrane Library, with the following descriptors, in Portuguese and English: rehabilitation, pelvic diaphragm, prolapsed and urinary incontinence, from 1997 to 2012. The search resulted in 886 articles, out of which were used 34 relevant clinical studies that answered to the questions made by the authors. Recent articles and those with higher level of evidence were prioritized, since they expose applications that are more coherent with the current practice.

In order to facilitate clinical applicability, the results are followed by a level of evidence (LE) graded from 1 to 5 and a degree of recommendation (DR) ranging from A to D, as described in Table 1. This classification was previously used by the Brazilian Committee of Endometriosis studies[11].

RESULTS AND DISCUSSION

The list of all the articles used, level of evidence and degree of recommendation are presented in Table 2.

Is the pelvic floor training efficient in the treatment of POP?

Slieker-ten-Hove et al.[7] analyzed the relationship between the muscular function of PF and POP and observed there are no significant differences in muscle strength and resistance during voluntary muscle contraction between the stages of POP. However, with cough, the involuntary contraction that results in the stabilization of the PF was significantly weaker in women with stage I and II POP than in women without POP. This study shows that women with POP present

Table 1. Level of evidence and degree of recommendation

Level of evidence	Degree of recommendation	Treatment	Diagnosis
1	A (strong)	Systematic review with meta-analysis Randomized study with large sample	Systematic review with meta-analysis Validation cohort with adequate pattern
2	B (moderate)	Randomized study with small sample	Exploratory cohort with adequate pattern
3	B (moderate)	Prospective study	Non-consecutive selection of cases Cohort with pattern not applied uniformly
4	C (weak)	Retrospective study	Case-control Cohort with inadequate pattern
5	D (very weak)	Case reports Experts' opinion	Case reports Experts' opinion

Source: Petta et al.[11]

Table 2. List of articles, level of evidence and degree of recommendation

Author	Year	Conclusion	Level of evidence	Degree of recommendation
Hove et al.[7]	2010	Women with POP presented with less resistant PF and less motor control	4	C
Bø, Talseth e Holme[8]	1999	PFME was more efficient in the treatment of stress UI than the electrical stimulation and vaginal cones	1	A
Felicíssimo et al.[10]	2010	There were no differences between both groups (supervise dor not) in the treatment for stress UI	1	A
Braekken et al.[12]	2010	PFME group obtained reduction of POP symptoms when compared to the control group	1	A
Braekken et al.[13]	2010	After supervised PFME, there were functional and morphological changes of the PF, such as the increased muscle volume	1	A
Stupp et al.[14]	2011	PFME group presented decreased POP symptoms, increased PF strength and resistance, better than control	2	B
Hagen e Stark[15]	2011	PFME has a positive effect on the symptoms and severity of the prolapse	1	A
Frawley et al.[16]	2010	There was no difference in the group that performed PFME before and after surgery in relation to vesical and prolapse symptoms	1	A
Lakeman et al.[17]	2012	They concluded that PFME before POP surgery can reduce the PV symptoms and improve QOL after the POP surgery	1	A
Jarvis et al.[18]	2005	They concluded that the evidence to indicate physical therapy before and after gynecological surgery is limited	1	A
Janssen, Lagro-Janssen e Felling[20]	2001	In the individual form of PFME, the length of each session and the time of treatment are smaller; in the group treatment, the motivation is reinforced among participants	3	B
Oliveira Camargo et al.[21]	2009	They concluded that after 12 weeks of rehabilitation, both groups (individual and in group) obtained significant reduction of UI and improvement of QOL, without significant differences	1	A
Zanetti et al.[22]	2007	The supervised PFME group presented statistically better results in the volume of urinary loss and in QOL than the control group	1	A
Hay-Smith e Dumoulin[23]	2010	The effect of the treatment seems to be greater in women with stress UI who participate in a supervised PFME program	1	A
Price, Dawood e Jackson[24]	2010	PFME should be included as a first line conservative treatment for stress, urge and mixed UI	1	A
Tsai e Liu[25]	2009	The supervised PFME group obtained improved stress UI when compared to the unsupervised group	3	B
Liebergall-Wischnitzer et al.[26]	2009	PFME and Paula Method for the treatment of stress UI are efficient and suggest superiority in terms of healing	1	A
Resende et al.[27]	2011	There was no difference in the electrical activity of the PFM during the contraction of the circular muscle, isolated or associated with the PFM contraction	4	C
Herderschee et al.[29]	2011	The biofeedback associated with PFME provided more benefits than isolated PFME in women with UI	1	A
Balcom et al.[30]	1997	The electrical stimulation reestablishes neuromuscular connections and improves the muscle fiber function	3	B
Herbison, Plevnik e Mantle[31]	2002	Vaginal cones are better than no active treatment for UI and may be as effective as PFME and electrical stimulation	1	A
Santos et al.[32]	2009	Vaginal cones and electrical stimulation are effective for stress UI	1	A
Castro et al.[34]	2008	There was significant improvement of UI in the groups that underwent PFME, electrical stimulation and vaginal cones in relation to the control group	1	A

POP: pelvic organ prolapse; PF: pelvic floor; PFME: pelvic floor muscle exercise; QOL: quality of life; PFM: pelvic floor muscles.

with less resistant PA muscles and less motor control[7] (NE 4 GR C).

Braekken et al.[12] investigated the efficacy of PFME to revert POP and its symptoms. Women with stage I, II and III prolapsed were divided into experimental and control groups. Both groups were enlightened as to changes of lifestyle and learned to perform the PF contraction. The experimental group also performed PFME composed of individual physical therapy sessions and exercises at home. Compared to control, the PFME group obtained bladder (3.0 mm) and rectum (5.5 mm) elevation and reduction of weight symptoms and vaginal vault. The conclusion was that PFME can be used as a treatment for POP[12] (LE 1; DR A).

In another study, functional and morphologic changes in PFME were assessed with ultrasound. The conclusion was that the supervised PFME increased muscle volume, reduced the hiatus in the levator ani muscle and elevated the resting position of the rectum and bladder[13] (LE 1; DR 1).

A pilot randomized study investigated the efficacy of PFME for the treatment of stage II POP. After 14 weeks, the intervention group showed significant improvement in relation to control group and also the decrease of symptoms. Besides, it presented with increased strength and muscular resistance and better electromyography parameters than the control group[14] (LE 2; DR B).

A Cochrane review published in 2011 concluded that there is currently evidence that the PFME has a positive effect on the symptoms and the severity of the prolapse. The performance of six months of treatment supervised by a physical therapist showed benefits in anatomical terms and improvement of symptoms. However, scientific evidence is still required in relation to the efficacy and the cost-benefit of PFME for the symptomatic prolapsed in the medium and long term[15] (LE 1; DR A).

Does physical therapy, which is used as an adjuvant method, help the treatment of the prolapse?

The idea to indicate adjuvant physical therapy is based on the fact that surgeries for prolapse or UI do not heal the pelvic muscle dysfunction that may have caused the disorder. Besides, conservative treatment could reduce residual symptoms or the ones that would appear after surgery.

Frawley et al.[16] performed a randomized study comparing patients who did PFME before and after surgery to correct prolapse or hysterectomy and women who only underwent surgery. No differences were found between groups as to bladder and prolapse symptoms assessed by questionnaires of QOL[16] (EL 1; DR A).

Lakeman et al.[17], in a review study, assessed if PFME in the pre-surgical period of POP improves the symptoms after surgery, also preventing recurrence. They concluded that PFME can reduce PF symptoms and improve QOL after surgery for POP, even though evidence is insufficient for its frequent indication in clinical practice[17] (LE 1; DR A). Jarvis et al.[18] also concluded that the performance of physical therapy before and after gynecological surgery is limited, and there is the need to conduct more randomized studies[18] (LE 1; DR A).

Is the pelvic floor training in urinary incontinence more efficient when conducted individually or in groups?

The individual exercise aims to a rehabilitation that specifically depends on the muscular condition of each patient. For the individual rehabilitation, the perfect method of evaluation has proven to be reliable and replicable. This method assesses strength and resistance, allowing a more specific conduct[19]. With the individual training, the length of each session and the time of treatment are smaller. However, in the group treatment there is the reinforcement of motivation among the participants[20] (LE 3; DR B).

Oliveira Camargo et al.[21] compared these two treatment techniques in women with stress UI and observed that, after 12 weeks, both groups obtained significant reductions of UI and improved QOL, without significant differences[21] (LE 1; DR A).

Is the pelvic floor training in urinary incontinence more efficient when supervised or unsupervised?

Zanetti et al.[22] assessed the effect of PF exercise in women with stress UI in two groups, with and without supervision, for three consecutive months. They observed that the supervised group presented statistically better results in the volume of urinary loss and in QOL than the control group. In the subjective evaluation, only 23.8% of the patients in

the control group were satisfied with the treatment, while in the supervised group, 66.8% of them were satisfied[22] (LE 1; DR A). However, another study observed that after the treatment with PFME there were no differences between the two groups, and the conclusion was that the supervised PFME is not efficient to treat for stress UI if the patient in the control group is trained correctly to perform PF contraction. According to the authors, this detailed instruction before the randomization made a difference in the final result between the two groups[10] (LE 1; DR A).

According to a Cochrane review, the effect of the treatment seems to be greater on women with stress UI who participate in a supervised PFME program for at least three months[23] (LE 1; DR A) and PFME should be included as a first line conservative treatment for stress, urge and mixed UI[23,24] (LE 1; DR A).

Tsai e Liu[25] analyzed if professional follow-up and digital palpation as part of the PFME (experimental group), with 99 women, is more efficient for stress UI than PFME performed by means of instructions in a book (control group). The conclusion was that the experimental group obtained significant decrease in the pad test ($p<0.001$) in comparison to the control group ($p=0.514$), and that the PFME performed correctly is more efficient even for patients with mild symptoms of stress UI[25] (LE 3; DR B).

Which training parameters should be used in the pelvic floor rehabilitation?

There is no consensus in data from literature about the number of repetitions, time of contractions or frequency and length of PF treatment with PFME[21] (LE 1; DR A). The number of contractions reported in the studies ranges from 8 to 12, 3 times a day, to 20 contractions, 4 times a day, and the length of contraction ranges from 4 to 40 seconds[23] (LE 1; DR A). This happens because of the anatomic and functional differences of each women[22], besides the fact that 30% of women are unable to properly contract the PF muscles[6]. That is why it is important that an expert professional be present to conduct the PFME[22] (LE 3; DR B). The postures and the length of the treatment with PFME also range and include sitting down, kneeling, standing up, and may last from one week to six months. The three-month length was the most frequently used[24] (LE 1; DR A).

How are the pelvic floor muscle rehabilitation and the Paula Method results performed?

Another conservative treatment, considered as alternative, called the Paula Method (because of its creator, Paula Garbourg), is based on the theory that all sphincters of the body work together and may affect each other. According to this theory, if there is weakness in the levator ani, resulting in stress UI, this muscle dysfunction can be improved by circular muscle training, such as the eyes, nose and mouth[26,27] (LE 1; DR A / LE 4; DR C).

Liebergall-Wischnitzer et al.[26] performed circular exercises (Paula Method) or PFME to treat women with stress UI. It was observed that both methods are efficient and suggest the superiority of the Paula Method in relation to healing rates[26] (LE 1; DR A).

On the other hand, some authors recommend that the contraction of the circular muscle is a way to help the patients who cannot isolate or contract the PFM, and not a way to strengthen them specifically[28]. Resende et al.[27] observed there was no differences in the electrical activity of PFM during the contraction of the circular muscles, isolated or associated with the PFM contraction[27] (LE 4; DR C). More studies comparing PFME and the Paula Method are required, with similar quantities of exercises, repetitions and periods of treatment.

Which other resources are used by physical therapy to rehabilitate the pelvic floor muscles?

The biofeedback uses a device to show the biological signals during the voluntary contraction of PFM, and presents this information back to the women in auditory and/or visual form, thus enabling the awareness and the proper contraction of PFM. A systematic review concluded that the biofeedback associated with PFME provided greater benefits than the isolated PFME in women with UI[29] (LE 1; DR A).

The electrotherapy to reeducate the PFM is a result of the passive contraction of levator ani muscles[24] (LE 1; DR A). The electrical stimulation is believed to increase the intraurethral pressure by means of a direct action of the efferent nerves to the periurethral muscles, to increase the blood flow to the PFM, to reestablish the neuromuscular connections and to improve the muscle fiber function[30] (LE 3; DR B).

Vaginal cones also represent a way to identify and train the PFM. A systematic review reported there is

limited evidence proving that vaginal cones are better than no active treatment for UI, and that they may be as effective as PFME and electrical stimulation. This review concluded that the cones should be offered as a treatment option, since the women who will not accept its use will know there are other available treatments[31] (LE 1; DR A).

Santos et al.[32] performed a clinical randomized study to compare the effects of electrical stimulation and vaginal cones in women with stress UI, and the conclusion was that both treatments were effective[32] (LE 1; DR A).

Bø, Talseth e Holme[33] performed a randomized study comparing PFME, electrical stimulation and vaginal cones in women with stress UI. The control group was composed of women who had not undergone any treatment. The conclusion was that PFME was more efficient to treat for stress UI[33] (LE 1; DR A). However, in another study with the same objectives, there was significant improvement of UI in the groups that used PFME, electrical stimulation and vaginal cones in comparison to the control group[34] (LE 1; DR A). This difference in results can be due to the way both studies performed the intervention. In the study by Castro et al.[34], a physical therapist supervised the treatment at home while in the study by Bø, Talseth and Holme[33], participants were treated at home. These data reinforce the importance of having a specialized professional for the treatment of PFM dysfunctions[33,34] (LE 1; DR A/LE 1; DR A).

CONCLUSION

Even though there are other methods of treatment, the PFME should still be the first conservative treatment choice for women with UI and POP, since it is a safe, efficient and low-cost method. PFME should be offered with specialized supervision and last at least for three months. Biofeedback, electrical stimulation and vaginal cones should be offered to the patients who cannot properly contract the PFM.

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