

EFFECTIVENESS OF PELVIC FLOOR EXERCISES IN THE PERIOPERATIVE PERIOD OF RADICAL PROSTATECTOMY: A LITERATURE REVIEW

Efetividade do exercício pélvico no perioperatório de prostatectomia radical: revisão de literatura

Efectividad del ejercicio para el suelo pélvico en el perioperatorio de prostatectomía radical: revisión de literatura

Review Article

ABSTRACT

Objective: To review the literature on the effectiveness of pelvic floor exercises in the perioperative period of radical prostatectomy. **Methods:** By using the health descriptors (DeCS) (prostatectomy) AND (physiotherapy) AND (pelvic floor) AND (urinary incontinence), articles were selected in English, Spanish and Portuguese, regardless of the year of publication. After searching in the BVS database, 26 studies were found: 17 in MEDLINE, 5 in IBECs, 2 in LILACS, and 2 in CENTRAL. Of this total, 17 were excluded because they did not meet the study inclusion criteria, culminating in a total of 9 articles, which were analyzed in this study. **Results:** Pelvic floor muscle strengthening exercises in the prostatectomy perioperative period have important results in terms of minimizing urinary incontinence, considering the strong impact of the problem on the patients' quality of life. **Conclusion:** Scientific evidence points out, despite the heterogeneity of techniques and samples, that the perioperative exercises show promising results in reducing postoperative urinary incontinence, mainly speeding recovery and healing or reducing the symptoms.

Descriptors: Prostatectomy; Physical Therapy Specialty; Pelvic Floor; Urinary Incontinence.

RESUMO

Objetivo: Realizar uma revisão na literatura sobre a efetividade dos exercícios pélvicos no perioperatório de prostatectomia radical. **Métodos:** A partir dos descritores em saúde (DeCS) – (prostatectomia) AND (fisioterapia) AND (assoalho pélvico) AND (incontinência urinária) –, foram selecionados artigos nas línguas inglesa, espanhola e portuguesa, independentemente do ano de publicação. Após a busca na base de dados da BVS, observaram-se 26 estudos: 17 da MEDLINE, 5 da IBECs, 2 da LILACS e 2 da CENTRAL. Desse total, 17 foram excluídos por não se adequarem aos critérios de inclusão da pesquisa, culminando em um total de 9 artigos, os quais foram analisados no presente estudo. **Resultados:** Os exercícios perioperatórios de fortalecimento da musculatura pélvica para prostatectomia apresentam resultados importantes quanto à minimização da incontinência urinária, tendo em vista o forte impacto do problema sobre a qualidade de vida dos pacientes. **Conclusão:** As evidências científicas apontam que, apesar da heterogeneidade das técnicas e amostras, os exercícios perioperatórios apresentam resultados promissores quanto à minimização da incontinência urinária pós-operatório, principalmente acelerando a recuperação e cura ou diminuindo os sintomas.

Descritores: Prostatectomia; Fisioterapia; Diafragma da Pelve; Incontinência Urinária.

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RESUMEN

Objetivo: Realizar una revisión de la literatura sobre la efectividad de los ejercicios para el suelo pélvico en el peri operatorio de prostatectomía radical. **Métodos:** Basado en los descriptores de salud (DeCS) - (prostatectomía) AND (fisioterapia) AND (suelo pélvico) AND (incontinencia urinaria) – fueron elegidos artículos en el idioma inglés, español y portugués independiente del año de publicación. Tras la búsqueda en la base de datos de la BVS se observaron 26 estudios: 17 de MEDLINE, 5 de la IBECS, 2 de LILACS y 2 de la CENTRAL. Del total, 17 fueron excluidos porque no correspondían a los criterios de inclusión de la investigación, finalizando un total de 9 artículos los cuales fueron analizados en este estudio. **Resultados:** Los ejercicios del perioperatorio para fortalecer la musculatura pélvica para la prostatectomía presentaron resultados importantes para la minimización de la incontinencia urinaria considerando el fuerte impacto del problema sobre la calidad de vida de los pacientes. **Conclusión:** Las evidencias científicas muestran que a pesar de la heterogeneidad de las técnicas y muestras, los ejercicios en el perioperatorio presentan resultados positivos para la minimización de la incontinencia urinaria en el posoperatorio acelerando la recuperación y la cura o disminuyendo los síntomas.

Descriptores: Prostatectomía; Fisioterapia; Diafragma Pélvico; Incontinencia Urinaria.

INTRODUCTION

Radical prostatectomy (RP) is one of the main types of treatment used for resection of prostate tumors, described as an effective procedure in the primary treatment of localized prostate cancer (PC)^(1,2). It is particularly indicated for patients with the disease in stages A and B – T1 and T2. When the tumor reaches periprostatic tissues, that is, in stage C – T3 and T4, the surgery does not remove the cancer completely and patients are best treated with radical radiotherapy⁽³⁾.

Although it presents high cure rates, the surgery is often accompanied by complications, mainly urinary incontinence (UI) and erectile dysfunction (ED)⁽⁴⁾. Currently, surgical techniques have a reduced incidence of complications. The most used are transurethral resection (TUR) and open or laparoscopic RP – the latter is the one with the shortest hospital stay and the lowest postoperative morbidity and costs⁽⁵⁾.

In RP, the prostatic urethra is removed and urinary control is maintained through the bladder neck and the external urinary sphincter. The anatomic lesions caused by the procedure tend to make urethrovesical junction less favorable to the maintenance of urinary continence, generating greater pressure on the external urethral

sphincter⁽⁶⁾ and leading to the occurrence of UI. This is defined as any involuntary loss of urine and is characterized by the negative impact on the emotional, social and economic spheres of the individual and their friends, family and caregivers⁽⁷⁾.

RP is among the main surgical procedures known to cause UI^(8,9) – the incidence of UI after RP ranges from 0.5% to 87% in the first six months and 5% to 44% in the first year after surgery⁽¹⁰⁻¹²⁾.

Both urinary and erectile function are related to the function of the pelvic floor muscles (PFM), which must contract to maintain urinary continence and relax to allow bowel and bladder emptying in addition to maintaining the anatomical position of the pelvic organs⁽¹³⁾.

Pelvic floor training is a specific method of contraction through exercises focused on the prevention and treatment of all types of abdominal, pelvic, and lumbar spine disorders^(14,15).

Pelvic physical therapy has emerged as a potential treatment for post-prostatectomy urinary sequelae, providing improved quality of life and health⁽¹⁶⁾. However, the effectiveness of such treatment on post-prostatectomy UI is not well elucidated yet, and this clarification is the main objective of the present study.

METHODS

This is a literature review of controlled clinical trials that carried out physical therapy techniques for muscle strengthening in the perioperative period in patients having radical prostatectomy.

The search for studies was carried out in the Virtual Health Library (*Biblioteca Virtual em Saúde – BVS*) database using the following health sciences descriptors (*Descritores em Ciências da Saúde – DeCS*): (radical prostatectomy) AND (physical therapy modalities) AND (instance: “regional”).

The study eligibility criteria were scientific articles published in English, Spanish and Portuguese languages, regardless of the year of publication of the manuscript due to the scarce literature on the theme.

Duplicate articles and those that did not mention physical therapy as primary treatment used in the studies were excluded.

The selection of studies was performed by analyzing the title, abstract and full text, respectively.

RESULTS

The search strategy used in the Virtual Health Library database yielded a total of 26 studies: 17 from the

Chart I - Summary of the studies included in the review.

Author/year	Number of participants	Intervention procedures	Main results
Centemero et al., 2010 ⁽¹⁷⁾	118 - Group A: Pelvic floor muscle exercises in the pre- and postoperative periods and at home (n= 59). - Group B: Pelvic floor strengthening exercises in the postoperative period and at home (n=59).	Group A: Four weeks before surgery. (twice a week for 30 minutes in the outpatient center and the participant's home). Group B: 48 hours after catheter removal. Exercises performed: Pelvic floor contraction.	Group A: Reached 44.1% (26 of 59) of continent patients in the group. Group B: Reached 20.3% (12 of 59) of continent patients in the group.
Geraerts et al., 2013 ⁽¹⁸⁾	180 - Intervention group: Received a PFMT program (from preoperative to postoperative period) controlled by the therapist and provided with electromyographic biofeedback (n= 91). - Control group: Received the same treatment as the intervention group, but only after catheter removal (postoperative) (n=89).	Experimental group: Started the training 3 weeks before surgery. Patients received one session of 30 min of PFMT per week. In addition, they followed a program of 60 contractions per day at home and received instructions on pelvic floor muscle contraction while coughing, sitting or getting up from a chair. Control group: Received a PFMT program after catheter removal (postoperative).	The incidence of continence did not present significant difference between the intervention group and the control group.
Hirschhorn et al., 2014 ⁽¹⁹⁾	139 - Private hospital group (n= 107) and public hospital group (n=32): both received sessions of pelvic floor muscle training during 9 months before and 9 months after surgery.	Intervention: All the volunteers received pelvic floor training and information on its importance for the treatment through printed reading material, DVD and internet provided by a physiotherapist and/or nurse.	There was a corresponding significant increase in provision of preoperative PFMT by private sector providers. Respondents receiving preoperative PFMT had significantly better self-report urinary incontinence at 3 months after radical prostatectomy than those who did not receive preoperative PFMT.
Patel et al., 2013 ⁽²⁰⁾	284 - Control group: Did not receive any physiotherapist-guided intervention (n= 132). - Intervention group: Patients performed Kegel exercises supervised or guided by a physiotherapist (n=152).	Control group: Patients were provided with verbal instructions on PFMT by the surgeon preoperatively. Intervention group: Patients performed Kegel exercises (10 contractions for 10 seconds) while sitting, standing and lying during four weeks preoperatively and were asked to repeat them at home.	At six weeks postoperatively, the intervention group presented a significant improvement in post-prostatectomy UI.
Marchiori et al., 2010 ⁽²¹⁾	332 - Group A: Postoperative pelvic floor exercises performed at the research setting (n=166). - Group B: Postoperative Kegel exercises for pelvic floor strengthening performed at home (n=166).	Group A: 30 days after catheter removal, patients were scheduled to perform Kegel exercises at home and at the research setting (three sets of 30 contractions daily, holding the contraction alternatively 1-2 seconds and 6-7 seconds. BFB and electrical stimulation lasting 30 minutes). Group B: Performed Kegel exercises at home during all the research period.	The median time of continence recovery in group A was 44±2 days, while in group B it was 76±4 days. Patients in Group A reached continence earlier than those in Group B.

Tienforti et al., 2012 ⁽²²⁾	<p>- Intervention group: Received sessions of BFB training and Kegel exercises (n=16).</p> <p>- Control group: Oral instructions on Kegel exercises to be performed at home (n=16).</p>	<p>Intervention group: Received one session of supervised BFB training, oral and written instructions on Kegel exercises and a structured program of postoperative exercises.</p> <p>Control group: Received, after catheter removal, only oral and written instructions on Kegel exercises to be performed at home only.</p>	<p>The two groups were homogeneous for all pre- and intraoperative features examined. However, the intervention group presented a significant improvement in continence at one, three and six months compared to the control group.</p>
Rajkowska-Labon et al., 2014 ⁽²³⁾	<p>- Group I (n=49) was subdivided into two subgroups (IA and IB).</p> <p>IA (n=23): Received PFM training with BFB and exercises to be performed at home.</p> <p>IB (n=26): Received PFM training without BFB and exercises to be performed at home.</p> <p>-Group II (n=32): Did not receive any intervention.</p>	<p>Group I: IA: rehabilitation program consisting of three parts: a) pelvic floor muscle training with BFB once weekly for 20-30 minutes; (b) PFMT according to spinal segmental stabilization, performed in the lying, sitting and standing positions; (c) exercises for the patient to perform on his own at home (3 times daily for 15-20 minutes).</p> <p>IB: another rehabilitation program: (a) PFMT without BFB according to the principles of segmental spinal stabilization (twice weekly for 30 minutes); (b) home-based exercises identical to that for subgroup IA.</p> <p>Group II: Did not receive any intervention and information was collected by phone.</p>	<p>Continence outcomes were obtained in Group IA x Group IB, and the difference was statistically significant (33/49 versus 4/32; 89% versus 11%).</p>
Dijkstra-Eshuis et al., 2013 ⁽²⁴⁾	<p>- Intervention group: Received session of PFMT with BFB.</p> <p>- Control group: Written instructions on PFMT.</p>	<p>Intervention group: During four weeks before surgery, the group performed behavioral training and BFB for 30 minutes.</p> <p>Control group: At 7-10 days after surgery, patients received written instructions on PFMT.</p>	<p>The intervention group presented a higher rate of continence at one year of follow-up; however, there was no significant difference in relation to the control group.</p>
Laurienzo et al., 2013 ⁽²⁵⁾	<p>49</p> <p>- Control group (n=15): Did not receive any physical therapy intervention.</p> <p>- Kegel exercises group (n=17): Patients performed Kegel exercises.</p> <p>- Electrical stimulation group (ES) (n=17): Received sessions of electrical stimulation associated with Kegel exercises.</p>	<p>Control group: Did not receive any therapy intervention preoperatively. Patients in this group were examined only once, before surgery, when the evaluation was performed and when they received information about the anatomy of the prostate region (as in the other groups).</p> <p>Kegel exercises group: Performed Kegel exercises only.</p> <p>Electrical stimulation group: Patients received 10 sessions of electrical stimulation. The parameters used included those for muscle strengthening. The group also performed 5 types of exercises to contract the pelvic floor muscles preoperatively.</p>	<p>There were no statistically significant differences between groups with respect to urine loss in patients undergoing radical retropubic prostatectomy.</p>

PFMT = pelvic floor muscle training; *UI: urinary incontinence; BFB = biofeedback; PFM = pelvic floor muscles

Medical Literature Analysis and Retrieval System Online (MEDLINE), 5 from the Central Register of Controlled Trials, 2 from the Spanish Bibliographic Index of the Health Sciences (*Índice Bibliográfico Espanhol em Ciências da Saúde – IBECS*) and 2 from the Latin American and Caribbean Health Sciences Literature (*Literatura Latino-Americana e do Caribe em Ciências da Saúde – LILACS*). Of this total, 17 studies were excluded based on the aforementioned criteria, resulting in 9 articles⁽¹⁷⁻²⁵⁾.

The age of the participants in the studies ranged from 46 to 80 years, and the sample size ranged from 32 to 120 participants. Regarding the type of intervention, most studies used pelvic floor exercises with or without biofeedback. Chart 1 presents a summary of the studies included in this review.

DISCUSSION

Nine controlled trials were selected for this review, and the general analysis of the combined studies suggest that pelvic floor exercises have benefits for the control of urinary incontinence after radical prostatectomy surgery.

One study aimed to check whether the addition of pelvic floor exercises in the pre- and postoperative periods would have an impact on the incidence of urinary continence when compared to the use of exercises only in the postoperative period. The results pointed to a higher incidence of urinary continence in the group that performed the exercises in the pre- and postoperative periods; however, there was no statistically significant difference⁽¹⁷⁾.

The same study design and the same results were also reported in another study conducted with 180 patients, i.e., the addition of exercises in the preoperative period had no statistically significant impact on the incidence of continence after surgery⁽¹⁸⁾. One possible explanation for this result is that short-duration pelvic floor exercises are not as effective as those performed for a longer period.

In contrast to these results, another study conducted with 139 patients from two hospitals – one public and one private – held the PFM training nine months before surgery in a group and nine months after surgery in another group, resulting in an incidence of urinary continence significantly higher when compared to the group that performed the PFM training only in the postoperative period⁽¹⁹⁾; such finding was similar to and corroborated another study conducted with a sample of 282 patients⁽²⁰⁾.

The analysis of these four studies pointed out an inconsistency regarding the addition of these exercises in the preoperative period of radical prostatectomy; however, it should be noted that these results should be interpreted with caution due to clinical heterogeneity between studies,

especially with regard to exercise dosage in the preoperative period.

In one of the clinical trials, participants were divided into two groups (intervention and control). The intervention group performed pelvic floor exercise training in the postoperative period consisting of Kegel exercises (strengthening of pubococcygeus muscles) associated with biofeedback and electrical stimulation; the control group performed the conventional clinical treatment only. At the end of the study, it was found that the intervention group achieved urinary continence 32 days faster than the control group⁽²¹⁾.

A similar study compared a supervised Kegel exercise program associated with biofeedback and instructions on home exercises in the preoperative period of RP surgery to a control group that received instructions on home exercises in the postoperative period. The results showed a significant improvement in urinary continence in one, three and six months after surgery⁽²²⁾.

In contrast to the three aforementioned authors, another study assessed the effectiveness of behavioral training associated with biofeedback in the preoperative period compared to a control group that received information on PFM training and found no significant difference between groups⁽²³⁾.

The results of some studies corroborate each other^(24,25) as they have found no significant difference between two treatment groups (a group that performed Kegel exercises and another that received electrical stimulation) and a control group that did not receive any physical therapy intervention.

Likewise, a study conducted with 258 patients compared behavioral therapy for pelvic floor to behavioral therapy exercises associated with biofeedback and a third control group that did not receive any intervention⁽²⁶⁾ and corroborated other studies on the theme^(24,25), although the two treatment groups had reduced the episodes of urinary loss by half.

The age range in the studies used was very diverse; however, it is known that advancing age is an important risk factor because the aging process is a predictor of the maintenance of continence and can hinder physical therapy intervention⁽²⁷⁾.

Considering that UI generates stress and impaired quality of life, any intervention that can control its signs and symptoms should be urgently investigated in order to minimize doubts and controversies about its treatment choices. Another important aspect refers to the fact that pelvic floor exercises are non-invasive procedures that can be used as strategies for prevention and treatment of UI after RP.

CONCLUSION

Scientific evidence shows that, despite the heterogeneity of techniques and samples, perioperative exercises have promising results regarding the minimization of postoperative urinary incontinence, particularly accelerating the recovery and healing or reducing the symptoms.

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