Actas Urol Esp. 2014;38(6):378–384

Actas Urológicas Españolas

www.elsevier.es/actasuro

ORIGINAL ARTICLE

Pre-operative training induces changes in the histomorphometry and muscle function of the pelvic floor in patients with indication of radical prostatectomy☆

Á. Ocampo-Trujillo[a,b], J. Carbonell-González[a], A. Martínez-Blanco[a,c], A. Díaz-Hung[a], C.A. Muñoz[d], R. Ramírez-Vélez[e,*]

[a] *Servicio de Urología, Hospital Universitario del Valle, Santiago de Cali, Colombia*
[b] *Programa de fortalecimiento de piso pélvico, Centro Médico Imbanaco, Santiago de Cali, Colombia*
[c] *Instituto de Investigaciones, Centro Médico Imbanaco, Santiago de Cali, Colombia*
[d] *Facultad de Salud, Programa de Medicina, Universidad del Valle, Santiago de Cali, Colombia*
[e] *Grupo GICAEDS, Universidad Santo Tomás, Facultad de Cultura Física, Deporte y Recreación, Bogotá, D.C., Colombia*

Received 7 July 2013; accepted 11 October 2013
Available online 21 March 2014

KEYWORDS
Urinary incontinence;
Pelvic floor muscle training;
Radical prostatectomy

Abstract

Objective: To evaluate the efficacy of preoperative pelvic floor muscle training (PFMT) on histomorphometry, muscle function, urinary continence and quality of life of patients undergoing radical prostatectomy (RP).

Material and methods: A prospective intervention clinical study was designed in 16 patients with indication of RP who were randomized into two groups. The Control Group received routine pre-surgical education (hygienic-dietary measures). The intervention group received a training session with supervised PFMT, three times a day, for four weeks, 30 days before the PR. Muscle function of the external urethral sphincter, contraction pressure of the levator ani, urinary continence and quality of life related to health (HRQoL) were evaluated before and after the intervention. At the end of the intervention and day of the surgery, samples of residual muscle tissue were obtained from the external sphincter muscle of the urethra for histomorphometric analysis.

Results: After the intervention, those participants who carried out PFMT showed an increase in the cross-sectional area of the muscle fibers of the external urethral sphincter ($1.313 \pm 1.075\ \mu m^2$ vs. $1.056 \pm 844\ \mu m^2$, $p = 0.03$) and higher pressure contraction of the levator ani ($F = 9.188$; $p = 0.010$). After catheter removal, 62% of patients in the experimental group

☆ Please cite this article as: Ocampo-Trujillo Á, Carbonell-González J, Martínez-Blanco A, Díaz-Hung A, Muñoz CA, Ramírez-Vélez R. El entrenamiento preoperatorio induce cambios en la histomorfometría y función de los músculos del suelo pélvico en pacientes con indicación de prostatectomía radical. Actas Urol Esp. 2014;38:378–384.

* Corresponding author.
E-mail addresses: robin640@hotmail.com, robinsonramirez@usantotomas.edu.co (R. Ramírez-Vélez).

and 37% in the control group showed no incontinence. After removal of the catheter, 75% of the experimental group did not require any pad compared to 25% in the control group (p = NS). There were no significant differences between the two groups in any of the HRQoL domains studied.
Conclusions: Pre-surgical PFMT in patients with RP indication induces changes in the histology and function of the pelvic floor muscles, without changes in urogenital function and HRQoL. These results provide new evidence regarding the benefit of PFMT in preventing RP associated complications.

PALABRAS CLAVE
Incontinencia urinaria;
Entrenamiento de músculos del suelo pélvico;
Prostatectomía radical

El entrenamiento preoperatorio induce cambios en la histomorfometría y función de los músculos del suelo pélvico en pacientes con indicación de prostatectomía radical

Resumen
Objetivo: Evaluar el efecto del entrenamiento preoperatorio del suelo pélvico (EPSP) en la histomorfometría, función muscular, continencia urinaria y calidad de vida de pacientes con indicación de prostatectomía radical (PR).
Material y métodos: Estudio prospectivo de intervención en 16 pacientes con indicación de PR aleatorizados en 2 grupos. Grupo control: educación prequirúrgica de rutina (medidas higiénico-dietéticas). Grupo de intervención: EPSP intensivo, 3 veces al día durante 4 semanas, 30 días previo a la PR. Antes y después de la intervención se evaluó la función del músculo esfínter externo de la uretra, presión de la contracción de los elevadores del ano, continencia urinaria y calidad de vida relacionada con la salud (CVRS). Al final de la fase de intervención y el día de la cirugía se tomaron muestras de tejido muscular residual del músculo esfínter externo de la uretra para análisis histomorfométrico.
Resultados: Después de la intervención los participantes que realizaron EPSP presentaron un incremento en el área transversal de las fibras musculares del músculo esfínter externo de la uretra (1,313 ±1,075 μm^2 *vs.* 1,056 ±844 μm^2, p = 0,03) y mayor presión de la contracción de los elevadores del ano (F = 9,188; p = 0,010). Posterior a la retirada del catéter el 62% de los pacientes en el grupo experimental y el 37% del grupo control no presentaron incontinencia. El 75% de pacientes del grupo experimental después del entrenamiento no requirió el uso de protectores, con respecto al 25% del grupo control (p = NS). No se encontraron cambios en la CVRS por grupos en ninguno de los dominios estudiados.
Conclusiones: El EPSP prequirúrgico en pacientes con indicación de PR induce cambios en la histología y función de los músculos del suelo pélvico, sin modificaciones en las funciones urogenitales y en la CVRS. Estos resultados proporcionan nuevas evidencias del beneficio del FMPP en la prevención de las complicaciones asociadas a la PR.

Background

Radical prostatectomy (RP) is the standard treatment option for prostate cancer.[1] Complications such as urinary incontinence (UI) and erectile dysfunction (ED) affect almost half of all patients after the surgery.[2,3]

Although both complications by themselves do not imply a negative prognosis, the impact they have on the quality of life of those who experience them has been demonstrated.[4,5]

Various interventions have been proposed for the treatment of UI after RP, such as pelvic floor muscle training (PFMT), functional training through biofeedback and electrical stimulation, among others.[6–8]

The recovery of urinary continence occurs as a spontaneous event in a considerable number of cases, and several studies have shown that continence can be achieved early with PFMT.[4–9] There is evidence from 6 studies that assessed the preoperative effect of PFMT in UI duration and severity after RP.[6,10–14] Five of these studies found positive results with preoperative PFMT.[6,9–11,13] However, the high variability in the study population, the follow-up time, the type of intervention and the continence criteria hinders the interpretation. Currently, there is no established consensus in the literature on the effectiveness of PFMT.[15,16] In Colombia, there have been few studies on PFMT after RP, and to date there are no reports that describe the changes in the histomorphometry of the external sphincter muscle of the urethra.

The aim of this study was to evaluate the effect of preoperative training of the pelvic floor on the muscle histomorphometry and function, on urinary continence and on the quality of life of patients with an indication for RP.

Materials and methods

During 2012 and the first half of 2013, a randomized prospective intervention study was conducted on 16 men older than