Actas Urol Esp. 2015;39(4):217–221

Actas Urológicas Españolas

www.elsevier.es/actasuro

ORIGINAL ARTICLE

Factors that influence the urodynamic results of botulinum toxin in the treatment of neurogenic hyperactivity☆

P. Gutiérrez-Martín[a,*], M. Vírseda-Chamorro[b], J. Salinas Casado[c], A. Gómez-Rodríguez[a], M. Esteban-Fuertes[b]

[a] *Servicio de Urología, Hospital Virgen de la Salud, Toledo, Spain*
[b] *Servicio de Urología, Hospital Nacional de Parapléjicos, Toledo, Spain*
[c] *Servicio de Urología, Hospital Clínico de san Carlos, Universidad Complutense, Madrid, Spain*

Received 29 September 2014; accepted 18 November 2014
Available online 1 April 2015

KEYWORDS
Botulinum toxin;
Urodynamics;
Detrusor hyperactivity;
Neurogenic bladder;
Spinal cord injury

Abstract

Objectives: To determine the urodynamic efficacy and factors that influence the urodynamic results of treatment of neurogenic detrusor hyperactivity with intradetrusor injection of botulinum toxin type A (BTX-A) in patients with spinal cord injury (SCI).

Material and methods: A retrospective study was conducted with a cohort of 70 patients composed of 40 men and 30 women with stable SCI (mean age, 39 ± 13.3 years) who underwent an intradetrusor injection of 300 IUs of BTX-A. A urodynamic study was conducted prior to the injection and 6 ± 4.3 months after the treatment. New urodynamic studies were subsequently performed up to an interval of 16 ± 12.2 months.

Results: The BTX-A significantly increased ($p < .05$) the cystomanometric bladder capacity, the bladder volume of the first involuntary contraction of the detrusor and the postvoid residue. We observed a decrease that tended toward statistical significance ($p < .1$) of the maximum detrusor pressure and the maximum urine flow. Neither the bladder accommodation nor the urethral resistance index (bladder outlet obstruction index) varied significantly. The increase in vesical capacity was maintained in 50% of the sample for more than 32 months. Age, sex, anticholinergic treatment and lesion age showed no influence in terms of the increase in bladder capacity. The indwelling urinary catheter (IUC) was the only statistically significant negative factor.

☆ Please cite this article as: Gutiérrez-Martín P, Vírseda-Chamorro M, Salinas Casado J, Gómez-Rodríguez A, Esteban-Fuertes M. Factores que influyen en los resultados urodinámicos de la toxina botulínica en el tratamiento de la hiperactividad neurógena. Actas Urol Esp. 2015;39:217–221.

* Corresponding author.
E-mail address: plgmartin@yahoo.co.uk (P. Gutiérrez-Martín).

Conclusions: The urodynamic effect of BTX-A is maintained for a considerable time interval. The IUC negatively influences the result of the treatment.

PALABRAS CLAVE
Toxina botulínica;
Urodinámica;
Hiperactividad del detrusor;
Vejiga neurógena;
Lesión medular

Factores que influyen en los resultados urodinámicos de la toxina botulínica en el tratamiento de la hiperactividad neurógena

Resumen

Objetivos: Determinar la eficacia urodinámica y los factores que influyen en los resultados urodinámicos del tratamiento de la hiperactividad neurógena del detrusor con inyección intradetrusoriana de toxina botulínica tipo A (TXB-A) en pacientes con lesión medular (LM).

Material y métodos: Se realizó un estudio retrospectivo en una cohorte de 70 pacientes formada por 40 varones y 30 mujeres con LM estable de 39 ± 13,3 años de edad (media ± desviación típica), sometidos a inyección intradetrusoriana de 300 UI de TXB-A. Se realizó un estudio urodinámico previo y otro a los 6 ± 4,3 meses del tratamiento. Posteriormente se realizaron nuevos estudios urodinámicos hasta un intervalo de 16 ± 12,2 meses.

Resultados: La TXB-A aumentó significativamene ($p < 0,05$) la capacidad vesical cistomanométrica, el volumen vesical de la primera contracción involuntaria del detrusor y el residuo posmiccional. Se observó una disminución con tendencia hacia la significación estadística ($p < 0,1$) de la presión máxima miccional del detrusor y el flujo miccional máximo. No varió significativamente la acomodación vesical ni el índice de resistencia uretral (BOOI). El aumento de la capacidad vesical se mantuvo en el 50% de la muestra más de 32 meses. La edad, el sexo, el tratamiento anticolinérgico y la antigüedad de la lesión no mostraron influencia respecto del aumento de la capacidad vesical. La sonda a permanencia (SVP) fue el único factor negativo estadísticamente significativo.

Conclusiones: El efecto urodinámico de la TXB-A se mantiene durante un considerable intervalo de tiempo. La SVP influye negativamente en el resultado del tratamiento.

Introduction

Spinal cord injury causes, in most cases, neurogenic lower urinary tract dysfunction (NLUTD). In patients with NLUTD, the main objective is to prevent kidney damage, so urodynamic results turn out to be much more important than the symptoms or impact of neurogenic dysfunction on the quality of life of patients.[1]

Neurogenic detrusor overactivity (NDO) is a common NLUTD in patients with spinal cord injury.[2] This dysfunction is the leading cause of urinary incontinence in these patients.[3] Furthermore, if it is associated with periurethral detrusor-sphincter dyssynergia (PDSD), it poses a risk of renal impairment due to the functional obstruction it causes.[4] Therefore, proper treatment is essential.

The initial treatment of NDO is with anticholinergic agents acting on bladder muscarinic receptors.[5] However, this treatment is not always effective. Moreover, it is associated with the occurrence of significant side effects, particularly dry mouth and constipation, resulting in abandonment in about 20% of patients.[6]

Intradetrusorian injection of botulinum toxin type A (BTX-A) has been proposed as a treatment in patients with NDO in whom anticholinergic therapy has been ineffective or poorly tolerated.[1] BTX-A has demonstrated both clinical and urodynamic efficacies in patients with NDO not responding to oral treatment with anticholinergics.[7] However, this treatment is not as effective in all patients. To date there is no study that analyzes the prognostic factors of the treatment outcome of NDO with BTX-A.

The main objective of our study is to determine which factors influence the urodynamic result of treatment with BTX-A in a series of patients with spinal cord injury and NDO. As secondary objectives we set to confirm the urodynamic efficacy of BTX-A and the duration of its therapeutic effect in patients with spinal cord injury and NDO.

Material and methods

A retrospective study of a cohort of 70 patients with SCI undergoing intradetrusorian BTX-A injection was performed for the treatment of NDO.

The criteria for the injection of botulinum toxin were urodynamic demonstration of NDO, refractory to anticholinergic treatment at high doses (oxybutynin 15 mg/day) (55 cases) or patient intolerance to anticholinergic treatment due to side effects (15 cases). In all cases, botulinum toxin injection was performed for the first time, and anticholinergic therapy was maintained in patients who were receiving it. In 33 cases, anticholinergics were associated with intermittent bladder catheterization and in 22 cases with permanent bladder catheter.

All patients signed an informed consent. Botulinum toxin being a licensed treatment as compassionate use for NDO,