Case Reports

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VESICOURETERAL REFUX IN OVERACTIVE BLADDER: MEDICAL RESOLUTION THROUGH BOTULIN TOXIN INJECTION


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Summary.- OBJECTIVE: Overactive bladder may have a neurogenic or non neurogenic origin. Sometimes, as a result of detrusor overactivity, disorders of the upper urinary tract function may appear. One of these alterations may be the appearance of associated vesicoureteral reflux. The treatment of overactive bladder may be done with anticholinergic drugs and if there is not response the use of botulin toxin type A is approved.

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Resumen.- OBJETIVO: La vejiga hiperactiva puede tener un origen neurogénico o no neurogénico. En ocasiones, como consecuencia de dicha hiperactividad del detrusor pueden producirse alteraciones en la funcionalidad del tracto urinario superior. Una de esas alteraciones puede ser la aparición de reflujo vesicoureteral asociado. El tratamiento de dicha vejiga hiperactiva puede hacerse con anticolinérgicos y en caso de no presentar respuestas, está aprobado el uso de toxina botulínica tipo A. El objetivo es demostrar el efecto de la toxina botulínica tipo A en el tratamiento de la vejiga hiperactiva y del reflujo vesicoureteral secundario a la misma.

MÉTODO: Presentamos el caso de un paciente de 10 años sin antecedentes personales de interés que al año de vida presentó infección urinaria y en cistouretrografía miccional seriada tenía reflujo vesicoureteral derecho grado 1. A los 4 años de edad presentó varios episodios de pielonefritis diagnosticándose de reflujo vesicoureteral severo bilateral no respondiendo a tratamiento con macroplastic® ni deflux®. Se realizó estudio urodinámico observando vejiga hiperactiva con disminución de la acomodación vesical.

RESULTADOS: Se realizó inyección intravesical de 200 U de toxina botulínica tipo A observando remisión del reflujo vesicoureteral y mejora en el estudio urodinámico. Al año se vuelve a inyectar toxina botulínica tipo A (300 U) y se repite un año después la inyección de 300 U, estando actualmente el paciente bien, sin alteraciones en el estudio urodinámico y sin reflujo vesicoureteral.

CONCLUSIÓN: La inyección repetida de toxina botulínica tipo A ha demostrado gran eficacia en el tratamiento de la vejiga hiperactiva en niños con mejoría del reflujo vesicoureteral secundario.

avoiding infiltrating the trigone, after confirmation of the failure of the anticholinergic treatment.

Six months after the first injection, voiding cystourethrography (VCU) reveals absence of right VUR and left VUR grade 1 (Figure 1.2); UDS did not show overactivity waves during filling phase cystomanometry with BC values comprising 64 ml/cmH\(_2\)O, CBC 341 ml, and MDP 26 cmH\(_2\)O, all of which constitutes a clear improvement with regard to basic UDS, and disappearance of UTIs. A UDS is repeated 12 months later that shows bladder overactivity waves of moderate intensity during filling phase cystomanometry, with a BC yielding 10 ml/cmH\(_2\)O, CBC 164 ml, and MDP 62 cmH\(_2\)O, so a second administration of Botulinum toxin type A was therefore delivered (300 U in 30 shots).

Six months after the second administration of Botulinum toxin, UDS does not show bladder overactivity waves during filling phase cystomanometry. One year after the aforesaid administration, UDS reveals small bladder overactivity waves during cystomanometry (BC 1.9 cmH\(_2\)O, CBC 95 ml, MDP 63 cmH\(_2\)O), and a new VCU detects a right VUR, grade 1, which implies the administration of a 3rd injection of Botulinum toxin (300U, 30 shots). A follow-up review 6 months after the 3rd administration does not report VUR during VCU or overactivity bladder waves during UDS; BC is 38.5 ml/cmH\(_2\)O; MDP 33 cmH\(_2\)O and CBC 260 ml (Figure 2.2).

**DISCUSSION**

Botulinum toxin is a powerful neurotoxin that has been used for a long time in the treatment of neurogenic or non-neurogenic OB. The experience acquired in the treatment of neurogenic OB is greater than that found in non-neurogenic OB. The administration of Botulinum toxin type A usually varies between 100 and 300 U for each treatment session.

The usual technique involves injecting the toxin intravesically in 10 to 30 shots. Most authors avoid injecting it through the bladder trigone to prevent a VUR, although there are no conclusive studies about it (2).

The effect of the toxin winds down or disappears after 7 to 12 months, so it is necessary to repeat injections...
2 or 3 times, and the effect of these last ones is as safe and successful as the effect of the first injection. Reports from UDSs and questionnaires on quality of life and micturition indicate that certain improvements have been observed after the administration of several injections of this drug in cases showing these urinary symptoms (3). In a comparative study on the use of Botulinum toxin in 2 groups of patients, one group with neurogenic OB and the other one with idiopathic OB, Popat et al report a similar improvement in both groups with regard to cystomanometric bladder capacity (CBC), as well as a decrease of maximum detrusor pressure (MDP), a lower micturition frequency and fewer urinary urgencies and incontinences episodes; he, therefore concludes that the use of Botulinum toxin type A is equally effective in both groups of patients who received the 1st injection (4).

Also, as in other published research works, Schmid et al detected an improvement in up to 88% of patients with OB, who were refractory to anticholinergic agents, after the injection of the Botulinum toxin, with disappearance of urinary urgency in 82% of cases, increment of cystomanometric bladder capacity in 56% of cases, as well as an increased bladder compliance, while the effect of the treatment lasted between 6 and 8 months (5).

Karsenty et al published a review on 18 articles that assess the adverse effects of the Botulinum toxin. Most of the works included in this review report a significant clinical improvement in up to 80% of patients that favors an increased cystomanometric bladder capacity, bladder compliance, as well as a decrease of the maximum detrusor pressure of up to 40 cm/H2O. Adverse side effects comprise urinary infection in 20% of cases and pain on the shot zone in 10% of cases. Therefore, this research works concludes that Botulinum toxin is a safe and effective treatment against OB (6).

The continuous use of Botulinum toxin in children with OB dates from the last 4-5 years, while an attempt has been made to establish a series of indications and criteria in treatments, as well as define the profile concerning safety and adverse effects after single injections or a repeated ones (7, 8). A review by Gamé et al analyzes the results and adverse effects of Botulinum toxin in children with OB. The mean age of children in the studies is around 10 years, and the number of shots delivered varies between 20 and 40, with a maximum of 300 U per session. According to the series consulted, the effects of the treatment last between 26 and 42 weeks. Between 40 to 80% of children experience an improvement of urinary incontinence, and there is also a decrease in the maximum detrusor pressure that shows 40 cm/H2O, as well as an increase in the cystomanometric bladder capacity. The occurrence of urinary infection is the adverse side effect mostly observed and represents 7-20% of cases (9).

According to the different studies of the literature and to our experience, we can currently regard Botulinum toxin type A as a safe and effective treatment for children with OB, since this treatment improves both the clinical manifestations and the urodynamic parameters to even achieve the disappearance of the VUR that the bladder hyperactivity triggered.

CONCLUSION

Intravesical injection of botulinum toxin type A can be used with a high safety profile and good results in the treatment of overactive bladder in children associated with vesicoureteral reflux. Repeated injections of this toxin have not increased the potential adverse effects of it and allowed us to treat overactive bladder and vesicoureteral reflux in a minimally invasive way.
REFERENCES AND RECOMMENDED READINGS
(*of special interest, **of outstanding interest)