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Intravesical botulinum type-A toxin (Dysport®) in the treatment of idiopathic detrusor overactivity in children

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Abstract *Objective:* Botulinum type-A toxin is increasingly used for refractory idiopathic detrusor overactivity (IDO) in children. We reviewed our experience and sought to ascertain the influence of dose and functional bladder capacity on outcome.
Patients and methods: Thirty patients, aged 6—16 years, with urodynamically proven IDO, had intravesical injections of 400—500 iu of Dysport®. Outcome was assessed clinically at least 5 months after the injection.
Results: Data were available for 27 patients. Urinary frequency was improved in 10; nocturia was improved in 7. Urgency resolved in 10 patients and urge incontinence in 12 (44%). Complications reported were UTI (7), urinary retention (1) and bladder pain (1).

The dose of Dysport® used was not significantly higher (14 iu/kg v 13 iu/kg) in patients dry at follow up than in those who remained wet ($p = 0.45$). Functional bladder capacity was not significantly different in patients dry after treatment ($p = 0.82$).
Conclusion: This retrospective study demonstrates similar response to a single treatment with intravesical Botulinum type-A toxin to previous series. We did not demonstrate a correlation between dose or functional bladder capacity and resolution of incontinence. A multi-centre study is required to further investigate this promising treatment.

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Introduction

Botulinum toxin is a purified neurotoxin derived from clostridium botulinum. The main effect of botulinum toxin is to inhibit signal transmission at the neuromuscular junction by inhibiting the release of acetylcholine [1]. In addition, botulinum toxin is now thought to have effects on the release of other sensory neurotransmitters; such as substance P and ATP, as well as reducing the axonal expression of capsaicin and purinergic receptors [2].

Commercially botulinum toxin A is available in a number of preparations of which two are in clinical use; BOTOX® (Allergen) and Dysport® (Ipsen). The units of these preparations are not interchangeable [3].

The use of botulinum toxin in children with neurogenic bladder overactivity is well established, with studies to date indicating that the intravesical injection of BOTOX leads to a clinically significant improvement without major adverse sequelae [4]. The use of botulinum toxin in children with idiopathic detrusor overactivity (IDO) has been less well studied, with only two previous reports of its use [5,6]. This is in contrast to the adult literature, where the use of botulinum toxin to treat detrusor overactivity is supported by a number of placebo controlled randomized trials [7–10]. A recent systematic review of the use of botulinum toxin for detrusor overactivity in adults concluded that intravesical injection lead to almost 4 fewer episodes of incontinence per day, and objective improvement in quality of life, at the expense of a nine fold increased risk of increased post void residual volumes when compared to placebo [11].

We retrospectively assessed the effectiveness of intravesical Dysport® (Botulinum Toxin A) in a cohort of paediatric patients with IDO. We also investigated the impact of dose and functional cystometric capacity on the efficacy of the treatment in our patients.

Methods

Thirty consecutive patients with incontinence secondary to IDO, who received botulinum toxin type-A treatment, were included in the study. Patients were offered intravesical Dysport® injection if they had urodynamically proven detrusor overactivity and had failed treatment with two or more anticholinergic medications. Detrusor overactivity was diagnosed on the basis of involuntary detrusor contractions observed during the filling phase, in accordance with the guidance of the International Children's Continence Society [12].

Dysport® was injected under a general anaesthetic using a rigid cystoscope. Injections were performed in 0.5–1 ml aliquots. The total dose of Dysport® used was between 400 and 500 IU. Injections were sited uniformly throughout the bladder, sparing the trigone (Figs. 1 and 2).

Clinical outcome was assessed five months after the first injection. Patients were seen in outpatients and questioned about symptoms of frequency, nocturia, urgency and incontinence. Children and parents were also asked about symptoms of urinary retention and urinary tract infection.

The dose of Dysport® used and the pre operative functional cystometric capacity (FCC), as a percentage of that predicted for age, in the patients who remained incontinent were then compared with those of the patients who were dry. Data were compared using a Mann–Whitney *U* test with differences considered significant when $p < 0.05$.

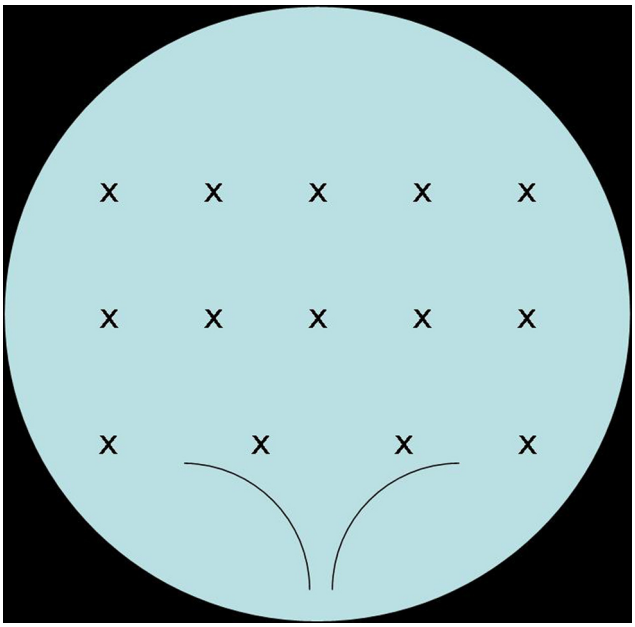

Figure 1 Schematic diagram of the bladder demonstrating sites for injection of Dysport®, indicated by crosses.

Results

Thirty eligible patients underwent treatment with Dysport®. Of these 3 patients did not attend follow up.

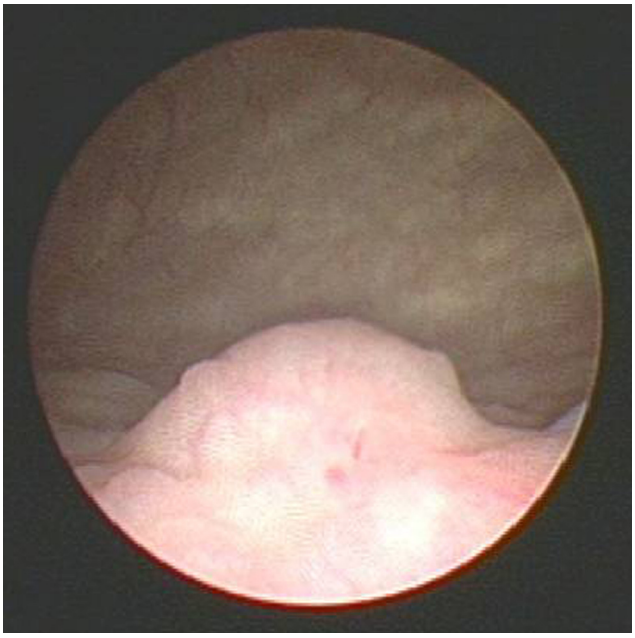

Figure 2 Intraoperative photograph showing the appearance of the bladder after the injection of Dysport®.