Journal of Pediatric Urology (2014) 10, 753—757

Journal of Pediatric urology

Single center experience with oxybutynin transdermal system (patch) for management of symptoms related to non-neuropathic overactive bladder in children: An attractive, well tolerated alternative form of administration

Joseph M. Gleason, Catherine Daniels, Katharine Williams, Abby Varghese, Martin A. Koyle, Darius J. Bägli, Joao L. Pippi Salle, Armando J. Lorenzo*

Division of Urology, The Hospital for Sick Children, Department of Surgery, The University of Toronto, 555 University Avenue, Toronto, Ontario M5G 1X8, Canada

Received 7 June 2013; accepted 17 December 2013
Available online 17 January 2014

KEYWORDS
Overactive bladder;
Incontinence;
Urgency;
Oxybutynin;
Children

Abstract *Objective:* Oxybutynin is the current gold standard drug for management of overactive bladder (OAB) in children, but can have significant side effects or be difficult to administer in multiple daily doses. Herein, we report our experience with transdermal oxybutynin patch (TOP) as an alternative in a selected patient population without neuropathic compromise.
Materials and methods: Consecutive patients assessed in a pediatric urology clinic over a 1-year period, diagnosed with OAB with minimum follow-up of 3 months, were included. TOP starting dose was 3.9 mg/day based on product design (Oxytrol). Demographics and outcomes data were retrospectively collected. Symptomatic response was defined as improvement or resolution of lower urinary tract symptoms.
Results: 35 children met inclusion criteria (mean age 8 years, range 4—16). Overall, 97% reported good symptom response. The main side effect was skin irritation at TOP site (35%), leading to discontinuation in 20%. There were no reports of other significant side effects. Mean bladder capacity increased from 104 ml to 148 ml at follow-up.

* Corresponding author. Tel.: +1 416 813 6465; fax: +1 416 813 6461.
E-mail addresses: glea0058@umn.edu (J.M. Gleason), armando.lorenzo@sickkids.ca (A.J. Lorenzo).

http://dx.doi.org/10.1016/j.jpurol.2013.12.017

Conclusions: Our data suggest that TOP is a viable alternative for children with non-neuropathic OAB who do not tolerate other formulations of oxybutynin. These findings highlight the potential benefit of transdermal drug delivery in the pediatric setting.

Introduction

Non-neuropathic lower urinary tract dysfunction in children often manifests with bothersome overactive bladder (OAB) symptoms, being a problem commonly encountered by family physicians, pediatricians, nurse practitioners and pediatric urologists. Affected patients suffer from urinary incontinence, frequency and urgency, which can be socially disruptive and debilitating at times. Multiple etiological factors have been associated with this condition, including bowel elimination dysfunction and constipation, poor fluid intake, fear of public restrooms, tendency to trigger holding maneuvers in order to postpone micturition in favor of other activities, and other pelvic floor dysfunctional learned behaviors. As a first step, these issues are addressed through behavioral rehabilitation, aggressive treatment of constipation, patient and parental education, and selective implementation of biofeedback. Once these efforts have been maximized, management of those with persistent symptoms often leads to consideration of pharmacologic options.

Oxybutynin is the time-honored, main anticholinergic medication prescribed and approved by many regulatory agencies for symptomatic OAB improvement in children, and is considered by many to be the gold standard for pharmacological therapy. Oral oxybutynin has repeatedly been shown to be safe and efficacious for symptom control and improvement in urodynamic parameters [1,2], at the expense of its side effect profile and administration schedule. Not surprisingly, worsening constipation, dry mouth, flushing, heat intolerance and the need for multiple doses spaced out during the day often outweigh the perceived benefits and lead to discontinuation of the medication, both in adults and children [2]. Advances in drug delivery mechanisms have resulted in the introduction of extended-release tablets with a more favorable pharmacokinetic profile (such as more constant drug plasma concentrations with lower maximal levels [3]), showing promise by allowing less frequent dosing, improved efficacy [4] and potentially fewer side effects [5]. Unfortunately, this option relies on the ability of the child to consistently swallow an intact tablet, as disruption interferes with the slow, sustained release of the medication in the gastrointestinal tract.

As an alternative delivery route, transdermal administration has been recently explored. This option appears particularly appealing considering that it obviates the need to swallow tablets while preserving the perceived benefits of sustained release preparations, namely less side effects, less frequent administration and sustained serum drug levels. Although promising, there is a paucity of data regarding the use of transdermal oxybutynin in neurologically intact children, supporting or disputing its role in the management of non-neuropathic OAB. Herein we report our experience with the use of the transdermal oxybutynin patch (TOP) as a treatment alternative in a selected patient population without neuropathic compromise.

Materials and methods

After approval by our institutional ethics review board, children with OAB managed at our center's pediatric urology voiding dysfunction clinic over a 1-year period (January 2011 to January 2012) were reviewed, identifying consecutive patients treated with TOP. Only patients with follow-up of at least 3 months were included. Any child with a clear neurological component to their bladder dysfunction was excluded in order to create a more homogeneous group of children with non-neuropathic (idiopathic) OAB. TOP was offered to children with a clear indication for an anticholinergic trial or continued previously initiated treatment, and to those interested in a sustained release formulation but unable to swallow tablets or capsules. The starting dose was 3.9 mg/day, dictated by product design (Oxytrol, Watson Pharma, Inc., Parsippany, NJ, USA), which was subsequently adjusted based on clinical response, as allowed by the fixed dose in the delivery system. The patch was changed twice weekly (every 3—4 days), applied to dry, intact skin on the abdomen, hip, or buttocks, and rotating sites to avoid re-application to the same location within a 1-week period.

Demographics and outcomes data were retrospectively collected, including flow rate and voiding diary information in some, previous anticholinergic therapy, and TOP tolerance. The primary outcome, symptomatic response, was assessed pragmatically and defined subjectively as greater than 50% self or parental perceived improvement, or complete resolution of lower urinary tract symptoms. These data were collected in the form of our standard clinic notes and encounters, and not on research-specific forms. Duration of therapy, medication and delivery method-specific side effects, and reason for discontinuation were secondary endpoints assessed. Statistical analyses were conducted with SPSS version 15 (IBM corp., Chicago, IL, USA).

Results

There were 444 new patients, and a total of 981 clinic visits to the nurse practitioner clinic in 2011. Of those, 35 were started on TOP and met inclusion criteria (mean age 8 years, range 4—16; 50% male; follow-up 3—6 months). In 69% (24/35) there was previous exposure to oxybutynin (six treated with Ditropan XL, the remaining with immediate-release oxybutynin), which was discontinued because of intolerable side effects (dry mouth, constipation, behavior changes). On direct questioning of patients and parents by the nurse practitioners, subjective improvement in OAB