SMGroup

SM Journal of Case Reports

Case Report

A Pediatric Case Series of Distal Ureteral Stones Clearance after Tamsulosin Treatment

Paula Nunes[1]*

[1]*Department of Pediatrics, Centro Hospitalar de Lisboa Ocidental, Nova Medical School, Portugal*

Article Information

Received date: Oct 17, 2016
Accepted date: Jan 05, 2017
Published date: Jan 11, 2017

***Corresponding author**

Paula Nunes, Department of Pediatrics, Centro Hospitalar de Lisboa Ocidental, Nova Medical School, Portugal, Tel: 00351210431441; Fax: 00351210431458, Email: pasdenunes@gmail.com

Keywords Pediatric cases; Tamsulosin; Distal ureteral stones

Abbreviations CT - Computerized Tomography; UTI - Urinary Tract Infection; CRP- C-Reactive Protein; KUB- Kidney-Ureter-Bladder

Abstract

Medical tamsulosin therapy in children has shown encouraging results in facilitating spontaneous clearance of lower ureteral calculi.

In this paper we report 5 paediatric cases of tamsulosin use in clearance of distal ureteral stones. All patients showed typical symptoms of sudden onset of abdominal/ flank acute pain and were diagnosed by imaging findings.

We report this case series to emphasize the importance of tamsulosin as initial option to treat urolithiasis in children at the emergency room.

Introduction

The increased incidence of urolithiasis in children has been confirmed in recent studies [1-5]. Changes in climate like global warming, different nutritional habits (decreased water ingestion, higher salt and processed foods intake) have been related as risk factors [2,5,6]. Some authors attribute the increase in stone diagnosis to the more frequent use of CT [2].

Ureteral calculi greater than 5 mm are unlikely to have a spontaneous passage and usually impact in the lower portion of the ureter [6-8].

Factors that appear to be the most useful in facilitating stone passage are an increase in hydrostatic pressure proximal to a calculus and relaxation of the ureter in the region of the stone [7].

In adults treatment with an alpha-1-adrenergic antagonist reduces the frequency and intensity of peristalsis of the ureter, increasing the chance of stone expulsion [3,4,6-9]. Based on this efficacy, tamsulosin has been used to test ureteral stone expulsion in children showing to be a safe and effective treatment option [5,10]. No major pharmacokinetic differences were found between pediatrics and adults when the effect of body weight was taken into consideration when tamsulosin was used [10].

Published data are limited regarding the use of alpha-blockers to manage distal ureteral stones in children [5,6].

Medical tamsulosin therapy has shown encouraging results in facilitating spontaneous clearance of lower ureteral calculi, [1,3,4,7-9] and short the time of stone passage in children [5]. A study using doxazosin did not show any improvement in the passage of distal ureteral stones in children [4,6].

Tamsulosin has been studied also in voiding dysfunction, neurogenic bladder and idiopathic urethritis [6,11].

Cases Description

This was a retrospective chart review of children diagnosed with symptomatic urolithiasis at distal ureter, stones larger than 5 mm.

We report our observations of 5 children. There were 3 male and 2 female patients. Patient ages ranged from 9 to 17 years (mean: 13.3 years).

Two boys and one girl were past medical history of urolithiasis.

All five presented at emergency room with sudden onset of abdominal/ flank acute pain.

Two patients report severe right flank pain radiating to the right lower quadrant.

Ultrasound (US) was used as the primary diagnostic imaging tool founding ureteric dilation and stones in two patients, the remaining were detected by plain-film radiography of the Kidneys, Ureters and Bladder (KUB) and confirmed by helical Computed Tomography (CT). The diameter of the largest stone was 11 mm (ranging between 6-11 mm).

Stone impaction in the ureter was detected at the level of the pelvic brim as the ureter crosses the iliac vessels in 2 patients and at vesico-ureteric junction in the remaining.

The patients were all hospital admitted, and the pain lasting 24 hours in duration till tamsulosin administration. Abdominal pain was associated with non-bilious vomiting in two patients.

All patients had conservative treatment, such as hydration and a non-streoidal anti-inflammatory drug, ibuprofen.

Patients were asked to score the intensity of pain according to the Faces Pain Scale Scored 0, 2, 4, 6, 8 and 10 (0 no pain, 10 the most severe pain perceived).

Pain was evaluated before and after tamsulosin administration (day 2, 3, 4 and at discharge).

The pain was scored at admission between 8-10 in all patients on Faces Pain Scale and decreased to 4-8 after tamsulosin administration (day 3).

Tamsulosin was recommended 0.01 mg/Kg/day once daily for 4 weeks to all this patients.

Urine was tested for: red cells, white cells, nitrite, pH, volume, specific weight, calcium, oxalate, uric acid, citrate, phosphate and magnesium, microscopy and culture.

Serum blood sample was collected to test creatinine, uric acid, ionised calcium, sodium, chloride, potassium, blood cell count and CRP.

Urinalysis demonstrated microscopic hematuria in 3 patients, trace of protein in 2 patients.

The most common metabolic abnormalities founded was hypercalciuria (2 patients), followed by hypocitraturia (2 patient), and hyperuricosuria (1 patient).

Increased water intake and reduction of salt consumption was recommended for all patients as well as potassium citrate.

There is no evidence of urinary tract infection, although 2 patients have started antibiotic which was suspended after results of urine culture.

Patients were followed up for 12 weeks: registration of side-effects of tamsulosin, ultrasonography, KUB radiography and renal function tests at 4, 8, and 12 weeks.

At 4 weeks 4 stones had passed and at 8 weeks none was detected by imaging studies.

Blood pressure readings remained normal at all follow up visits.

In our study the only adverse effect to tamsulosin was nausea in 1 patient.

None required extracorporeal shock wave lithotripsy, ureteroscopy or ureteric surgery.

Discussion

We observed that tamsulosin and conservative therapy had good results treating ureteral colic in all these patients. Ureteral colic is the most important indication for treatment [6], this could result of muscle spasms, submucosal edema and infection [6]. To date, only few studies have comproved the passage of ureteral stones with tamsulosin treatment [3]. Spontaneous stone expulsion decreases with increasing stone size and there are differences between individual patients. Most studies demonstrate stone expulsion in the first 10 days of medical therapy [6]. In our study it happened a little later, at 4 weeks almost all (n=4) had passed stones. 70% of ureteral stones are discovered in the distal third of the ureter [6] as well as in all our patients.

Extracorporeal shock wave lithotripsy is the procedure of choice in treating most calculi in pediatric age [5] however it requires general anesthesia. If ureteral stones could be expelled with pharmacotherapy, although minimally invasive, theses procedures and their associated costs could possibly be avoided [5,6,9].

In our study we didn't found significant adverse side effects on our patients.

Calcium oxalate and calcium phosphate stones are the most common types [6]. Because we find hypercalciuria (2 patients), hypocitraturia (2 patient), and hyperuricosuria (1 patient) as metabolic potential factors causing stones we prescribed potassium citrate.

We believe that tamsulosin will be beneficial to pediatric patients during colic episodes and might provide a viable alternative to extracorporeal shock wave lithotripsy, ureteroscopy or ureteric surgery to resolve the urolithiasis.

Since many pediatricians serves as the initial conduit into the health care systems for patients with severe pain caused by urolithiasis we think that is important to consider medical treatment as initial option.

References

1. Shahat A, Elderwy A, Safwat AS, Abdelkawi IF, Reda A, Abdelsalam Y, et al. Is Tamsulosin Effective after Shock Wave Lithotripsy for Pediatric Renal Stones? A Randomized, Controlled Study. J Urol. 2016; 195: 1284-1288.
2. Penido MG, Srivastava T, Alon US. Pediatric primary urolithiasis: 12-year experience at a Midwestern Children's Hospital. J Urol. 2013; 189: 1493-1497.
3. Tasian GE, Copelovitch L. Evaluation and medical management of kidney stones in children. J Urol. 2014; 192: 1329-1336.
4. Tasian GE, Cost NG, Granberg CF, Pulido JE, Rivera M, Schwen Z, et al. Tamsulosin and spontaneous passage of ureteral stones in children: A multi-institutional cohort study. J Urol. 2014; 192: 506-511.
5. Mokhless I, Zahran AR, Youssif M, Fahmy A. Tamsulosin for the management of distal ureteral stones in children: a prospective randomized study. J Pediatr Urol. 2012; 8: 544-548.
6. Aydogdu O, Burgu B, Gucuk A, Suer E, Soygur T. Effectiveness of doxazosin in treatment of distal ureteral stones in children. J Urol. 2009; 182: 2880-2884.
7. Resim S, Ekerbicer H, Ciftci A. Effect of tamsulosin on the number and intensity of ureteral colic in patients with lower ureteral calculus. Int J Urol. 2005; 12: 615-620.
8. Singh SK, Pawar DS, Griwan MS, Indora JM, Sharma S. Role of tamsulosin in clearance of upper ureteral calculi after extracorporeal shock wave lithotripsy: a randomized controlled trial. Urol J. 2011; 8: 14-20.
9. Hollingsworth JM, Rogers MA, Kaufman SR, Bradford TJ, Saint S, Wei JT, et al. Medical therapy to facilitate urinary stone passage: a meta-analysis. Lancet. 2006; 368: 1171-1179.

10. Tsuda Y, Tatami S, Yamamura N, Tadayasu Y, Sarashina A, Liesenfeld KH, et al. Population pharmacokinetics of tamsulosin hydrochloride in paediatric patients with neuropathic and non-neuropathic bladder. Br J Clin Pharmacol. 2010; 70: 88-101.

11. Van Batavia JP, Combs AJ, Horowitz M, Glassberg KI. Primary bladder neck dysfunction in children and adolescents III: results of long-term alpha-blocker therapy. J Urol. 2010; 183: 724-730.