



## Annual Congress

Gdansk, Poland  
September 12-14 2019



**ABSTRACT BOOK**

**8:00-8:50 | NEUROGENIC BLADDER - STATE OF ART.**Mario de Gennaro - *Bambino Gesù Children's Hospital, Rome, Italy***SESSION 1: NEUROGENIC BLADDER****1** 8:50**The combination of Mirabegron and an Anticholinergic in the treatment of the paediatric neurogenic bladder.**Anne J. Wright, Riccardo Manuele, Rim El-Rifai,  
Arash Taghizadeh, Massimo Garriboli, Jo Clothier,  
*Evelina London Children's Hospital, London UK***INTRODUCTION:**

Anticholinergics are first line pharmacological treatment for paediatric neurogenic bladder followed by intravesical botulinum toxin (botox). They are not always effective. We aimed to evaluate the combination of mirabegron, a new  $\beta_3$  agonist, with an anticholinergic as step-up therapy.

**METHODS:**

Retrospective chart review from 2016 in our institution of all consecutive children receiving mirabegron 50mg daily in addition to:

1. established anticholinergic therapy (n=9; tolterodine 5, oxybutynin 2, trospium 1, solifenacin 1)
2. botox + anticholinergic therapy (n=4; tolterodine 3, oxybutynin 1)/ botox discontinued.
3. botox alone (n=4) replaced with mirabegron 50mg + solifenacin 5mg daily.

Any botox injection was a minimum of 6 months prior to starting mirabegron.

All used CIC. Comparison of symptoms, adverse effects and baseline urodynamic parameters (max of 12 weeks after botox injection) with post-treatment urodynamics (minimum of 4 weeks mira+anticholinergic). Median values and Wilcoxon signed rank test used for statistical analysis.

**RESULTS:**

Of 20 children started on Mirabegron, 17 were eligible for analysis; median age 9 years (5-14 y) M 12, F 5: myelomeningocele 10, lipomyelomeningocele 6, spinalcord tumour 1. Urodynamic parameters after 12 weeks combination treatment (4-32) revealed an increase in cystometric capacity from 280 (129-530) to 320mls (225-700),  $p < 0.05$ , and

compliance from 10.7 (4-116) to 46(11-200)mls/cm H<sub>2</sub>O,  $p < 0.001$ , and a decrease in max p det from 30(0-65) to 0(0-67)cm H<sub>2</sub>O,  $p < 0.02$ . Symptom improvement occurred in 9/17 with less leakage/dryness. No adverse effects reported, with no observed change in blood pressure or liver function tests. No upper tract change noted during treatment on ultrasound and serum creatinine. In 4 patients the effect was maintained for 15.5 (10-19) months. In 4 patients there was no improvement in urodynamic parameters. These patients had low compliance at the start: average 8.45 (4.36-12.3)mls/cm H<sub>2</sub>O).

Mirabegron combined with an anticholinergic is useful in management of the paediatric neurogenic bladder.

**2** 8:58**B-3 agonist effect as an adjuvant in pediatric neurogenic bladder.**Cristian Sager, Marianela Sanmartino, Carol Burek,  
Santiago Weller, Juan Pablo Corbetta, Javier Ruiz,  
*National Hospital of Pediatrics Garrahan, Buenos Aires, Argentina***PURPOSE:**

$\beta_3$ -adrenoreceptor agonis, such as Mirabegron is a molecule with a distinct mechanism of action from antimuscarinics. Combination of therapies with different antimuscarinics is being used in children and adolescents to reduce intravesical pressures and detrusor overactivity. Our objective was to evaluate the efficacy and safety of mirabegron as add-on therapy, to treat children with neurogenic bladder, refractory to antimuscarinics.

**MATERIALS AND METHODS:**

We retrospectively studied 37 cases (male sex: 59%) with neurogenic bladder caused mainly by myelomeningocele (80%), refractory to oral oxybutynin 20 mg daily, who started add-on treatment with Mirabegron 25 mg daily at 12.7 ± 2,4 years of average age. Urodynamic parameters and voiding diary/ intermittent catheterization were used to assess effectiveness at least 3 months later. For statistical analysis, t test for paired data and chi square test for categorical variables were used.

**RESULTS:**

The addition of Mirabegron increased maximal cystometric capacity by an average of 125 ml (from 322 ± 102 ml to 446 ± 138 ml).

**3** 9:06

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**Bladder function and upper urinary tract status in boys with posterior urethral valves ten years after temporary high urinary diversion with transurethral incision of the valves in the same procedure.**

Piotr Gastoł, Lidia Skobejko-Włodarska, Małgorzata Baka-Ostrowska,  
*Department of Paediatric Urology, Children's Memorial Health Institute, Warsaw Poland*

**PURPOSE:**

There is controversy regarding high urinary diversion in boys with posterior urethral valves (puv), because of the fear about bladder and upper urinary tract function after closure of the ureterocutaneostomy. We evaluated patients with puV after Sober en-Y or ring Williams ureterocutaneostomy with transurethral incision of the valves (TUI) performed in the same procedure, 5 and 10 years after ureterocutaneostomy closure.

**MATERIAL AND METHODS:**

Till 2005, 29 boys after puV had closure of the ureterocutaneostomies. The indications for high urinary diversion was hydroureteronephrosis and renal insufficiency (creatinine > 1 mg%) in every case. Ureterocutaneostomy closure with the reimplantation of the ureters if it was needed was performed after 2 to 10 years (mean 4 years). In that moment 15 boys had mild dilatation of the upper urinary tract, nobody had

renal insufficiency, high voiding pressure was detected in 9 patients. We evaluated upper urinary tract condition, renal and bladder function, 5 and 10 years after closure of the ureterocutaneostomy.

**RESULTS:**

Five years after ureterocutaneostomy closure 11 boys had hydroureteronephrosis, 10 mild dilatation of the upper urinary tract and 8 had no dilatation. After ten years we observed hydroureteronephrosis in 11 boys, mild dilatation in 9, and no dilatation in 9 patients. Five years after ureterocutaneostomy closure renal insufficiency was observed in 8 patients, nobody had end stage renal disease. After ten years renal insufficiency was in 15 cases and 5 were dialyzed. Five years after ureterocutaneostomy closure normal bladder function was observed in 12 boys, high voiding pressure in 12, unstable bladder in 4, bladder with small capacity in 1. Ten years after normal bladder function was in 23 cases, high voiding pressure in 5, unstable bladder in 1. There was not small bladder with impaired compliance.

**CONCLUSION:**

In long follow-up after closure of the ureterocutaneostomies in puV patients upper urinary tract dilatation is stable, renal insufficiency grows with time. There is no deleterious effect on bladder function, even bladder function improves with years.

**4** 9:14

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**Pediatric robotic augmentation ileocystoplasty for refractory neuropathic bladder.**

Sujit Chowdhary, Sarita Vihar,  
*Division of Pediatric Urology, Indraprastha Apollo Hospital, Sarita Vihar, New Delhi, India*

**OBJECTIVE:**

To report the safety and feasibility of robotic augmentation ileocystoplasty in children with neuropathic bladder refractory to the standard medical treatment.

**METHODS:**

All children who underwent robotic augmentation ileocystoplasty between April 2014 to December 2018 were included in the study. The indications for surgery were rising serum creatinine, deteriorating differential renal function, progressive renal scarring, recurrent urinary tract infection (UTI) and debilitating incontinence despite more than 6 months of medical management. All patients underwent ultrasonography, micturating cystourethrography, uroflowmetry, voiding cystometry, dimercaptosuccinic acid renal scan and a diagnostic cystoscopy prior to robotic augmentation ileocystoplasty.

**RESULTS:**

Eight children underwent robotic augmentation ileocystoplasty. Median age was 8.5 years (range: 2-15 years). Five patients had a neurogenic bladder secondary to spinal dysraphism while three patients had non-neurogenic neurogenic bladder. Two patients had ventriculo-peritoneal (VP) shunt in situ. The mean operative time was 270 minutes (range, 240 to 330 minutes). The mean hospital stay was 9 days (range: 7 -15 days). The median follow up is 38 months (range: 05-60 months). The bladder capacity increased by 111% at three months after surgery. The end filling detrusor pressure decreased by 57% at three months. All the eight patients remained dry and none had any attack of UTI in the follow-up period. One patient developed urinary leak which healed on conservative treatment. All patients are on clean intermittent catheterization and once a day bladder wash.

**CONCLUSION:**

Robotic augmentation ileocystoplasty in children is safe and feasible. Larger studies and longer follow up studies are needed to establish the robotic approach as the gold standard although the early results are encouraging.

**5** 9:22**Need for anticholinergic after bladder enlargement.**

Cristian Sager, Carol Burek, Javier Ruiz, Santiago Weller, Juan Pablo Corbetta, National Hospital of Pediatrics Garrahan, Buenos Aires, Argentina

**INTRODUCTION:**

The objective of bladder augmentation (BA) is to create a reservoir of adequate capacity, low pressure and without leaks. Some patients with BA require anticholinergic drugs to treat leakage of urine.

**OBJECTIVE:**

We aimed to determine the need for anticholinergic medication in children with BA and its urodynamic correlation.

**MATERIAL AND METHODS:**

16 patients with BA performed at 8.4 years of age (3-15) were studied retrospectively. In 73% sigmoid colon was used. The follow-up was 5.3 years average (2-14). Urodynamic variables were compared with and without oral oxybutynin. Urodynamics without medication were classified as: improved, acceptable for age and worsened; in relation to urodynamics with medication. The cases urodynamics worsened and /or urinary incontinence (with acceptable DLPP) restarted oxybutynin. For statistical comparisons, non-parametric tests were used, with significance <0.05.

**RESULTS:**

The means of urodynamic values with oxybutynin and without oxybutynin were: Maximum cystometric capacity:  $653 \pm 308$  vs.  $660 \pm 268$  ml (p: 0.65); volume in which compliance is altered:  $472 \pm 231$  vs.  $532 \pm 192$  ml (p: 0.14); Pressure at the end of filling:  $29 \pm 5.8$  vs.  $24 \pm 5.7$  cmh<sub>2</sub>o (p: 0.02) and volume of onset overactivity  $499 \pm 295$  vs.  $491 \pm 200$  ml (p: 0.43); respectively. Urodynamics were subclassified without medication in: 9 improved; 5 acceptable for age and 2 worsened. 5 of 16 patients (31%) needed to restart treatment with oxybutynin due to worsened urodynamics and / or urinary incontinence. There were no significant urodynamic differences between studies "without oxybutynin" that could differentiate those that required restarting anticholinergic treatment compared with those that did not require continuing anticholinergics.

**CONCLUSIONS:**

After BA, around 30% needed to restart treatment with anticholinergics; in some cases, regardless of urodynamic results. In studies without medication, there were no important differences that would indicate restarting treatment.

**6** 9:30**Drawbacks of bladder continent catheterizable conduits in children.**

Dario Guido Minoli , Alfredo Berrettini,  
Erika Adalgisa De Marco, Michele Gnech,

Gianantonio Manzoni UOC UrologiaPediatria - Fondazione IRCCS  
Ca' GrandaOspedale Maggiore Policlinico, Milan, Italy

**INTRODUCTION:**

Children requiring complex genitourinary reconstruction may benefit from creation of continent catheterizable conduits (CCC) for renal preservation and social inclusion. The aim of the present study is to evaluate their complication rate.

**PATIENTS AND METHODS:**

We retrospectively review indications and outcomes of 39 patients undergoing CCC in a single center over a 8-years period (2010-2018). Incidence and timing of postoperative complications were analysed comparing the surgical techniques adopted (Mitrofanoff/Yang-Monti) combined with VQZ stoma construction.

**RESULTS:**

Indications for CCC included: 15 exstrophy complex, 10 anorectal malformation, 6 posterior urethral valve, 5 neurogenic bladder, 1 double urethra, 1 Prune belly syndrome, 1 uro-genital sinus. Median age at surgery was 6yrs (range: 11mo-19yrs). 28 postoperative complications occurred in 12 (31%) patients in a median follow-up period of 4.4y (6mo-8.4yrs). The median onset of complications was 5.4 m (9d-7y). 3 (8%) patients developed postoperative stoma wound dehiscence; 11 (28%) patients developed 14 conduit stenosis (9 treated endoscopically, 2 required cutaneous VQZ revision, 2 required entire surgical conduit revision, 1 didn't require any surgical procedure), 3 patients developed stomal granulomas formation (1 treated by endoscopic electrocution, 1 required mucosal revision, 1 didn't require any surgery). Complications occurred in 10 (30.3%) of 33 patients in whom the Mitrofanoff procedure was adopted and in 2 (33.3%) of the 6 patients in whom the Monti-Yang technique was preferred (not significant). 8 (44.4%) of 18 cases undergoing concurrent enterocystoplasty developed postoperative complications, compared to 4 (19.1%) of the 21 patients in which no added procedures were required.

**CONCLUSIONS:**

CCCs in children still carry the burden of high risk of complications and postoperative revisions, with no statistically significant relation to the surgical technique adopted and the need of concurrent augmentation cystoplasty.

**7** 9:38**In utero myelomeningocele repair improve urinary continence and reduce the risk of constipation.**

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**INTRODUCTION:**

According to two-hit hypothesis, wrong neurulation as well as permanent chemical and mechanical damage of the spinal cord and nerves lead to irreversible changes in the bladder, the bowel and functions of the lower limbs. Prenatal surgery of the MMC reduces duration of exposure of the nervous tissue to the effect of damaging agents, reducing therefore the risk of changes in the nervous system. The aim of the study was to evaluate the lower urinary tract function, frequency UTI, the degree of social urine continence and the occurrence of constipation in children who underwent prenatal or postnatal surgery for MMC.

**MATERIAL AND METHODS:**

72 patients with MMC were assessed and divided into the prenatal group (36 patients) and the postnatal one (36 patients). All children, regardless the time of operation, received the same treatment after birth. The urodynamic tests, USG, cystourethrography were performed in all patients along with evaluation of the UTI's, social urine continence and presence of constipation.

**RESULTS:**

Urodynamic and imaging studies showed no differences between the test groups. Children from the prenatally operated group showed statistically significant lower number of urinary tract infections, better urine continence and less frequent constipation.

**CONCLUSIONS:**

Prenatal MMC repair ensures statistically significant improvement of the degree of social urinary continence, reducing the risk of urinary infections and constipation. Time of MMC repair does not statistically influence the urodynamic tests results and the urodynamic parameters are not the prognostic elements to assess the social urinary continence possibility in patients with the neurogenic bladder.

**8** 9:46

### **Analisis of the clinical and urodynamic outcome after untethering in patients with secondary tethering of the spinal cord.**

Michał Wolnicki<sup>1</sup>, Stanisław Kwiatkowski<sup>2</sup>, Janusz Sulislawski<sup>1</sup>, Barbara Dobrowolska-Glazar<sup>1</sup>, Ireneusz Honkisz<sup>1</sup>, Rafał Chrzan<sup>1</sup>,

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2. Department of Pediatric Neurosurgery, Jagiellonian University Medical College, Krakow, Poland

**BACKGROUND/AIMS:**

Secondary tethering of the spinal cord (TSC) occurs in 3-30% of patients with a history of spinal cord dysraphism. Patients with symptomatic Tethered Spinal Cord Syndrome (TSCS) require surgical intervention. This study aimed to investigate indications, clinical and urodynamic (UDS) parameters before and after spinal cord untethering (SCU).

**METHODS:**

We analyzed prospectively data of patients between 2013 and 2016 with secondary tethering of the spinal cord before and after untethering. Clinical protocol and UDS were performed before SCU and in 6mth, 12mth and 24mth. Number of patients in database is 102. Sixty-eight patients met the inclusion criteria. The median operative age was 75mth (range 14mth - 214mth). Of the 34 excluded patients, 20 had primary

TSCS and 14 were lost to follow-up. The indication for SCU was neuro-orthopedics in 18 patients (26,5%) and urological in 50 patients (73,5%).

**RESULTS:**

In our study bladder compliance, bladder volume and pressure were evaluated by UDS in patients that derived SCU. Clinical improvement was defined as better urological symptoms, abdominal, neuro-orthopedics symptoms of patients signalized in patients protocol. In our study 32 (47%) had bladder overactivity preoperatively, twelve 12 (17,6%) improved after SCU. After SCU urological symptoms improved in 29 (42,6% and stabilized in 21%). 18% remained incontinent or had worsening incontinence. Some of patients 17(25%) after SCU had worsening of urological and neuro-orthopedics symptoms. In 2 patients after SCU developed micturition dysfunction with recurrent testis inflammation.

**CONCLUSIONS:**

There was no significant change in bladder compliance. Postoperative urodynamic study showed a significant increase in bladder volume after 24mths ( $p < 0.05$ ). After SCU many patients gained socially, acceptable continence but required both anticholinergics (Ach) and clean intermittent catheterization (CIC). The benefits and the best time of untethering (SCU) surgery are still controversial.

**9** 9:54

### **Neurogenic bladder due to lipomas and lipomenigoceles.**

Cristian Sager, Marianela Sanmartino, Carol Burek,

National Hospital of Pediatrics Garrahan, Buenos Aires, Argentina

**INTRUDUCTION AND AIM OF THE STUDY:**

Lipomas / lipomenigoceles (LMC) are a type of presentation of closed dysraphisms and can generate neurogenic bladder with behavior similar to open dysraphisms. LMC can generate bladder dysfunctions, as one of the first signs of neurological deterioration. Objective: To analyze the urological commitment, mainly urodynamic pre and postoperative (POP) of the neurosurgery.

**MATERIAL AND METHODS:**

Retrospective, observational study of 94 patients LMC. Clinical-Urological presentation was described; urodynamic status pre-and postsurgical. Excision of lipomatous mass and release of filum terminale were performed as the main neurosurgical procedures. Descriptive statistics were used for categorical variables (chi-squared test).

**RESULTS:**

Population: girls: 69%. Average age of consultation: 2.1 years old. The most frequent sign of presentation were: Tumor: 80% and UTI: 23%. Asymptomatic urological: 42.5%. Pre and postoperative urodynamics showed: improvement in bladder capacity, compliance, overactivity and postvoid residual in 5, 4, 10 and 19 cases; respectively. Worsening in bladder capacity, compliance, overactivity and postvoid residual in other 3, 2, 8 and 27 cases; respectively. In dysynergy (2), areflexia (6) and ineffective voiding (3), there were no statistically significant changes. It was required in POP to incorporate de novo: oxybutynin in 27 cases and intermittent catheterization in 25 cases.

**INTERPRETATION OF RESULTS:**

The LMC did not present urological symptoms in almost 50%. Urodynamic have defined the type of dysfunction, preoperative and POP. The overactivity of the detrusor and the post-void residue were the variables that have suffered most modifications. On the other hand, cystometric capacity and bladder wall accommodation were the variables that did not change in 70% of the cases.

**CONCLUSIONS:**

With the urodynamic studies was possible to specify the type of neurogenic bladder dysfunction and its POP changes. Preoperative urodynamic evaluation and POP in these congenital malformations are essentials.

**10 10:02****Application of intestinal patch previously used in augmentation cystoplasty for continent urinary stoma construction.**

Lidia Skobejko-Wlodarska,

*Childrens Memorial Health Institute, Department of Paediatric Urology, Warsaw, Poland*

**AIM:**

To evaluate of the usefulness of construction of continent urinary stoma from intestinal patch previously used in bladder augmentation in neuropathic patients with problems or inability to learn CIC via urethra.

**MATERIAL AND METHOD:**

The surgical procedure was used in 13 patients in whom earlier augmentation cystoplasty was applied with using sigmoid in 9 and ileum in 4 from 2004 to March 2012. Additionally one required closure of the incompetent bladder neck and 2 others Malone procedure due to severe constipation. The operation starts from measurement of the distance between reservoir and umbilicus to calculate the length of the flap used in stoma construction. The vascular pedicle of intestinal patch is gently prepared for its damage preservation. A longitudinal flap with the width of about 2 cm is harvested in midline from anterior wall of intestinal patch 2 cm above the bladder neck and it is continued and finished distally including the posterior wall of the intestinal patch. This allows to take the flap of adequate length which is needed in stoma construction. Very important during the flap preparation is identification of its blood vessels and their separation from main vascular pedicle of the patch without its and their damage. The harvested, well-vascularized flap is formed in a tube over a 12-14 Fr catheter using only one-layer running suture (5-0 vicryl). The stomal conduit is placed into sero-muscular tunnel which is formed from the wall of the intestinal patch of augmented bladder. The free edges of the created tunnel are sutured above stoma channel. Continent urinary stoma is always localized in umbilicus.

**RESULTS:**

Patients' follow-up ranged from 7 to 15 years. All constructed urinary stomas are continent and easily catheterizable. Taking a flap from intestinal patch in order to construct the stoma, has not led to any permanent decrease of the bladder capacity. The bladder capacity enlargement to primary volume was observed during 12 months in 12 patients.

**CONCLUSIONS:**

Construction of continent stoma from intestinal patch previously used in bladder augmentation allows to limit extension of surgical approach only to extraperitoneal space and allows to avoid bowel resection. The method creates no length limitation

to the flap in stoma construction. It may be used in patients after augmentation cystoplasty who have lost ability to walk.

## 11 10:10

### Single setting Robot-Assisted Kidney Transplantation (RAKT) in a child consecutive to single-site laparoscopic nephrectomy in the child and living-donor related robotic nephrectomy: initial Ghent experience.

Anne-Françoise Spinoit<sup>1</sup>, Ann Raes<sup>2</sup>, Nathalie Moreels<sup>3</sup>, Agnieszka Prytula<sup>2</sup>, Ruben De Groote<sup>1</sup>, Achilles Ploumidis<sup>1</sup>, Elise De Bleser<sup>1</sup>, Caren Randon<sup>3</sup>, Johan Vande Walle<sup>2</sup>, Frank Vermassen<sup>3</sup>, Erik Van Laecke<sup>1</sup>, Karel Decaestecker<sup>1</sup>,

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3. Department of Thoracic and Vascular surgery, Ghent University Hospital, Ghent, Belgium

#### INTRODUCTION:

Kidney transplantation is gold-standard treatment for end-stage renal disease (ESRD) in children. Robot-Assisted Kidney Transplantation (RAKT) in adults is becoming increasingly common in centers of reference with promising results and potentially improved morbidity compared to open transplantation. Our objective was to evaluate the feasibility, perioperative and early postoperative outcomes of RAKT in children. To our knowledge, this is the first report of RAKT in a child. The technique is presented in our video.

#### MATERIAL & METHODS:

January 2018: a 7-years-old boy with ESRD due to congenital uropathy received a kidney transplant from his mother. Simultaneously in two operation theatres, the boy underwent single port (GelPOINT®) right laparoscopic nephro-ureterectomy (LNU) and his mother underwent robot-assisted left donor nephrectomy (RADN). The GelPOINT® was used as single-site for the LNU to minimize invasiveness.

Two full surgical teams were operating at the same time. Subsequently, the boy underwent RAKT, introducing the kidney through the GelPOINT®.

#### RESULTS:

Total operative time for RAKT, RADN and LNU was 195, 140, 180 min respectively, with warm, cold and rewarming ischemia times 1.5, 200 and 47 min respectively. Vascular and ureterovesical anastomosis times were 30 and 25 min respectively. Blood loss was 50, 20, 300 cc respectively. No intraoperative or postoperative complications were noted. Convalescence of both the donor and the recipient was uneventful. Estimated glomerular filtration rate of the graft at day 1, 3, 7, 30 and 90 was 75, 94, 62, 46 and 60 ml/min/1,73m<sup>2</sup> respectively. At 4 weeks, he was diagnosed with acute humoral rejection grade IA (Banff score g0i2t2) treated successfully with pulsed corticosteroids.

#### CONCLUSION:

RAKT in children is technically feasible and safe, resulting in excellent graft function. Concomitant nephrectomy can be done laparoscopically through the single-site GelPOINT®. It should be attempted by an experienced RAKT team with the full support of pediatric nephrologists.

## 12 10:18

### Evolution of neurogenic bladder by myelomeningocele with proactive approach.

Cristian Sager, Carol Burek, Juan Pablo Corbetta, Javier Ruiz, Santiago Weller, Marianela Sanmartino,  
*National Hospital of Pediatrics Garrahan, Buenos Aires, Argentina*

#### INTRODUCTION:

The proactive management of myelomeningocele (MMC) has contributed to decreasing their progression to end-stage renal disease. But some patients will continue to show unresolved bladder changes and renal involvement.

**13** 10:26**OBJECTIVE:**

To demonstrate that early urological evaluation shows alterations in the majority of patients with MMC and that some alterations will continue to be evident, despite our proactive intervention.

**MATERIAL AND METHODS:**

A retrospective study including 60 patients with MMC. All of them underwent renal /bladder ultrasound, videourodynamic (VUD), renal DMSA and laboratory test when they were less 1 year old. 30 cases were followed by 5 years. The statistical analysis was performed with logistic regression analysis SAS 9.2. High risk VUD were defined as: 1) pressure >40 cmH<sub>2</sub>O at expected cystometric capacity (ECC) or DLPP >40 cmH<sub>2</sub>O; 2) high pressure in detrusor overactivity >65 cmH<sub>2</sub>O for girls and >80 cmH<sub>2</sub>O for boys and 3) VUR.

**RESULTS:**

In the initial evaluation all the patients showed inefficient voiding: 98.3% and high-risk VUD were observed in 28 cases (46.6%). 77% of the cases with abnormal DMSA presented high risk VUD. Although there was high percentages of urodynamic alterations, VUR and UTI in abnormal DMSA, only the Pdet >20 cmH<sub>2</sub>O at ECC was statistically significant (p: > 0.0436). 30 cases have been followed until 5 years and presented pathological DMSA: 33% (from the initial 26.6%); Reduced cystometric capacity: 30% (from the initial 16.6%); intravesical pressure >20 cmH<sub>2</sub>O a ECC: 33% (from the initial 10%). All patients were on with oral oxybutynin and CIC.

**CONCLUSIONS:**

In the initial urological evaluation of patients with MMC, almost all had inefficient voiding, the half of them had high-risk VUD and one-third showed abnormal DMSA. After 5 years of follow-up in half of the cases, the abnormal endovesical pressures and the pathological DMSA had increased, despite the proactive approach.

**Neurogenic bladder dysfunction in severe anorectal malformation.**

Cristian Sager, Javier Ruiz, Carol Burek, Santiago Weller, Juan Pablo Corbetta, *National Hospital of Pediatrics Garrahan, Buenos Aires, Argentina*

**INTRODUCTION AND AIM OF THE STUDY:**

A cloacal deformity is a rare type of anorectal malformation. In a cloacal deformity, the rectum, vagina and urologic structures join into one common channel. The cloacal malformations are a challenge in the approach and urological management. They are often associated with bladder dysfunction and urine incontinence.

**OBJECTIVE:**

To evaluate the association of cloacal malformation, spinal axis alterations and post-reconstruction urodynamic behaviour.

**MATERIAL AND METHODS:**

We retrospectively described 36 patients with cloacal malformation in a period of 21 years. Two groups were build according to common channel length: smaller and larger than 3 cm, presence of lumbar-sacral alterations and urological approach. The concept of "Severe Bladder Dysfunction" (SBD) was use for those patients who had Pdetmax greater than 40-cmH<sub>2</sub>o and / or bladder capacity less than 65% for age. The IBM SPSS program was used for statistical analysis. A value of p <0.05 was considered significant.

**RESULTS:**

There were 33.3% cloacal canal greater than three cm. Almost 48% had dysplasia or sacral agenesis. Around 84% presented bladder dysfunctions, mainly ineffective voiding contraction. Taking into account the length of the common channel, there were no statistically significant differences in the presence of SBD (p <0.3), but there were more frequency of reduced accommodation and ineffective emptying with long channel. SBD was observed in 88.2% with sacral alterations (p <0.1). In nine patients the association of long channel, sacral alterations and SBD was observed (p<0.07). Around 27.7% needed Mitrofanoff and 5.6% augmentation cystoplast. Urine incontinence was present in 36%.

**CONCLUSION:**

The cloacal malformation associates a high rate of bladder dysfunction, mainly voiding dysfunction and incontinence of urine. Alterations of the lumbar-sacral axis contribute to this type of bladder dysfunction.

**14 10:34**


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**Effect of Injection Botox treatment on symptoms and urodynamic findings in pediatric neurogenic bladder refractory to medical management.**

Sujit Chowdhary, Deepak Kandpal,

*Division of Pediatric Urology, Indraprastha Apollo Hospital, New Delhi, India*

**AIM:**

To evaluate clinical and urodynamic efficiency of injection Botox treatment in pediatric patients with neurogenic bladder refractory to maximal medical management.

**PATIENTS AND METHODS:**

Between 2010 and 2018, Thirty-four patients aged from 3 to 17 years (median 9 years) were treated with Botox injections. The inclusion criteria were children with detrusor pressure > 40 cm H<sub>2</sub>O at less than 60% expected bladder capacity with CIC and maximal dose of oxybutynin, recurrent UTI, worsening hydroureteronephrosis and debilitating incontinence. Clinical response to incontinence, duration of the response, and urodynamic results before and 1-3 months after treatment were evaluated.

**RESULTS:**

Out of these 34 children, 23 had spina bifida (including sacral agenesis in 2), 9 had neuropathic bladder (NB) secondary to posterior urethral valves, 2 had NB secondary to anorectal malformation. Mean cystometric bladder capacity changed from 280 ± 90 ml to 353 ± 100 ml, maximal detrusor pressure decreased from 45 ± 31 cmH<sub>2</sub>O to 32 ± 21 cmH<sub>2</sub>O. Mean decrease in leak point pressure was 12 cm H<sub>2</sub>O. there were on local or systemic side effects in any of the patients. The median Follow up is 36 months with a range of 8 to 72 months. At follow-up

five patients had undergone bladder augmentation because of persistent incontinence. One patient has undergone renal transplant. There was death in one patient 1 year after augmentation ileocystoplasty due to congestive heart failure.

**CONCLUSIONS:**

About one third of pediatric patients with severe neurogenic bladder had a good response and another one third had partial response to Botox treatment. About fifteen percent children eventually required augmentation ileocystoplasty even after a trial of injection Botox. It appears from our study that Botox is a safe alternative for neurogenic bladder refractory to medical management before considering bladder augmentation as a bridge therapy or even permanent treatment.

**11:00-11:20 | LUTS – DIAGNOSTIC TOOLS – STATE OF THE ART**Israel Franco – *Yale-New Haven Hospital, USA***SESSION 2 - LUTS – DIAGNOSTIC APPROACH****1** 11:20**Interpretation of Uroflow Curves: A Global Survey Measuring Inter and Intra Rater Reliability.**Jose Murillo Netto<sup>1,2</sup>, Sarah Lambert<sup>2</sup>, Therese Collett-Gardere<sup>2</sup>, Kaitlhyn Murphy<sup>2</sup>, Adam Hittelman<sup>2</sup>, Israel Franco<sup>2</sup>;1. *Universidade Federal de Juiz de Fora,*2. *Yale University New Haven, Connecticut, US***INTRODUCTION:**

Lower urinary tract dysfunction (LUTD) is a common problem in children. To properly evaluate these children ICCS recommends the so called non-invasive urodynamics that includes voiding diary, ultrasound with post-voiding residue evaluation and uroflowmetry. Unfortunately, there is a large amount of intra and inter observer variability in defining curve shapes which may lead to communication and data analysis problems. This study evaluates inter and intra rater reliability (RR) on uroflow interpretation.

**METHODS:**

864 questionnaires were emailed to health professionals in the field of pediatric urology throughout worldwide, including demographic questions, 11 uroflow curves, plus two duplicated curves. Responders described flows based on: ICCS classification, whether they were fractionated or smooth (SF), and by curve shape-bell, plateau or tower (BPT).

**RESULTS:**

A total of 29.5% of the questionnaires returned. Seventy percent were physicians (44% Urologists). 60% reported greater than 10 years experience. Responders were from 5 continents. Intra RR for repeated curves demonstrated lower agreement rate for bell smooth curve comparing ICCS classification vs. BPT ( $p=0.026$ ), and also for the interrupted plateau curve when compared to SF ( $p=0.001$ ). The inter RR for the set of 7 smooth curves demonstrated low agreement rate between ICCS classification and

BPT ( $p=0.003$ ). For the 6 fractionated curves low agreement rate was also observed comparing ICCS classification to SF ( $p<0.001$ ). Those with greater time of experience in the field ( $> 10$  years) were more reliable ( $p<0.001$ ).

**CONCLUSIONS:**

This is the largest study looking at inter and intra RR of uroflows in a disparate population. It was evident that inter and intra RR were poor. There was more agreement for curves rated as SF between raters. In our opinion, the use of flow shapes should be abandoned in lieu of a flow index system and defining the shape as SF.

**2** 11:28**Obesity and overweight in a large sample of children with incontinence - report of 1641 cases.**

Teresa Holländer, Hussong Justine, von Gontard Alexander, Weber Michaela, Sambach Heike,

*Saarland University Hospital, Department of Child and Adolescent Psychiatry, Hamburg, Germany***INTRODUCTION:**

In the past decades, the prevalence of childhood obesity has increased worldwide. In Germany, the prevalence of overweight among 3 to 17 year-olds is 15.4% (90th percentile) and the prevalence of obesity is 5.9% (>97th percentile). Childhood obesity is associated with constipation, but not necessarily with incontinence. Therefore we investigated the relationship between overweight, obesity and different subtypes of incontinence in children.

**MATERIAL AND METHODS:**

Data of 1641 consecutive children and adolescents (67% boys) presented in a tertiary, specialized outpatient department for incontinence between 2012 and 2018 were

analyzed. Prevalence of obesity and overweight in different subtypes of incontinence (diagnosed according to ICCS criteria) was examined.

#### RESULTS:

57.5% of children had nocturnal enuresis (NE), 33.5% daytime urinary incontinence (DUI) and 40.1% fecal incontinence (FI). Overweight (>90th percentile) was diagnosed in 16.6% of patients. Patients with isolated NE had higher rates of overweight than those with FI (22.3% vs. 15.3%), while children with DUI did not differ significantly (15.8%). Within the NE group, children with secondary non-monosymptomatic NE had higher rates than those with primary non-monosymptomatic NE (26.4% vs. 16.1%). Obesity (>97th percentile) was found in 5.7% of all patients, in 10.4% of patients with NE, in 4.0% of patients with DUI and in 4.7% of patients with FI. Rates of obesity were significantly higher in NE vs. DUI and FI, but did not differ between subgroups.

#### CONCLUSIONS:

Children with incontinence have higher rates of overweight. Especially children with NE show higher rates of both obesity and overweight compared to other subtypes of incontinence. As high BMI percentiles interfere with incontinence treatment, general screening for overweight and obesity is recommended.

### 3 11:36

#### A carer perspective of the discomfort experienced by their child during video-urodynamics (VUD).

Joanna Clothier, Kay Willmott, Massimo Garriboli,  
Anne Wright, Claire Foster,

*Evelina London Children's Hospital, London, UK*

#### INTRODUCTION AND AIM:

To understand from the carer perspective the discomfort felt by their child during video-urodynamic investigation (VUD). To identify whether there is a difference in the reported discomfort between age-groups and genders, or whether previous VUD experience or involvement of a play specialist has an impact.

#### METHODS:

Single-centre, prospective, anonymised questionnaire study performed on consecutive VUD in paediatric patients aged 0-19 years over 5 month period. Questionnaire completed by the carer immediately following investigation. Specific questions explored discomfort observed related to all aspects of the study using Likert scale, 1-5 (5 high). Carers were also asked to rate experience vs expectation 1-5 (5 much worse than expected). Values expressed as median. Mann-Whitney test was used to explore difference in regards to: gender, previous VUD experience and play specialist involvement. Kruskal-Wallis test was used to compare experience rated between age groups (<5 years vs 5-7 years vs 8-11 years vs 12+ years).

#### RESULTS:

We analysed 104/112 (93%) completed questionnaires. Overall pain score: bladder catheter placement 1/5, rectal line insertion 2/5, holding a void 2/5, voiding 1/5, EMG stickers 1/5, removal of bladder catheter 2/5, removal of rectal line 1/5. Overall experience vs expectation 1/5 (much better than expected). There was no significant difference in overall experience reported by carers between the different age groups ( $p=0.93$ ). No differences were also found related to gender ( $p=0.95$ ) or between children who had previously had VUD vs those having VUD for the first time ( $p=0.2$ ). The involvement of a play specialist resulted in a significantly better experience ( $p=0.00084$ ).

#### CONCLUSION:

Parents report generally low levels of discomfort felt by their child during VUD with no significant difference related to gender or previous experience. The support of the child by a play specialist has a significant role in improving their experience and should be considered for all.

### 4 11:44

#### Severity of constipation and lower urinary tract symptoms in children and adolescents. Are they related?

Ubirajara Barroso Junior, Ana Paula Dias Souto Schimitz, Glicia Estevam de Abreu, Eneida Regis Dourado, Maria Luiza Veiga da Fonseca, Ana Aparecida Martinelli Braga,  
*Bahia School of Medicine and Public Health, Salvador, Bahia, Brazil.*

**INTRODUCTION:**

It is not yet established whether lower urinary tract symptoms (LUTS) severity is related with functional constipation (FC) severity, since the Rome IV criteria do not quantify FC.

**OBJECTIVES:**

To assess the correlation between FC severity as determined by the adapted constipation scoring system (ACSS) and LUTS severity in children/adolescents, and to assess the correlation between this ACSS and the Rome IV criteria.

**STUDY DESIGN:**

A cross-sectional study including 5- to 17-year-old patients with LUTS, with or without FC. Patients with neurological and/or anatomical abnormalities of the genitourinary and/or gastrointestinal tract were excluded. Girls with Dysfunctional Voiding Score System (DVSS)  $\geq 6$  and boys with DVSS  $\geq 9$  were diagnosed with lower urinary tract dysfunction (LUTD). Patients with at least two positive Rome IV criteria were considered constipated. The severity of FC according to the ACSS was classified as mild for scores of 1-10, moderate for scores 11-20 and severe for scores 21-30.

**RESULTS:**

Of 128 patients with LUTS, 71 (55.5%) were female. LUTD was detected in 107 patients (83.6%) and was more common in girls. FC was present in 80 patients (62.5%). Constipated children had higher constipation scores and DVSS, with both scores increasing with the severity of FC. Correlation was moderate between the ACSS and the DVSS ( $\beta=0.5$ ,  $p=0,000$ ) and was strong between positivity for a greater number of Rome IV criteria and the ACSS ( $\beta=0.7$ ,  $p=0,000$ ). Most of the constipated patients had mild or moderate FC, while in 30 non-constipated patients (62.5%) the ACSS indicated mild FC.

**CONCLUSION:**

The intensity of FC as measured by the ACSS correlated with LUTS severity in children /adolescents with LUTS/LUTD. In constipated patients, there was a correlation between the ACSS and the Rome IV criteria. In non-constipated patients, the ACSS identified symptoms/signs of bowel dysfunction not picked up by the Rome IV criteria.

**Association between rectal diameter and Lower urinary tract symptoms (LUTS) in children.**

Ubirajara Barroso Junior, Glicia Estevam de Abreu, Leonardo Azevedo de Souza, Eneida Regis Dourado, Ana Paula Dias Souto Schimitz, Maria Luiza Veiga da Fonseca, *Bahia School of Medicine and Public Health, Salvador, Bahia, Brazil*

**INTRODUCTION:**

Several studies have already demonstrated relationship between Lower Urinary Tract Symptoms (LUTS) and constipation. Rectal diameter can be analyzed by pelvic ultrasound and it could be an auxiliary method in constipation 'diagnosis.

**OBJECTIVE:**

To analyze the association between rectal diameter and LUTS, as well as with constipation.

**METHODS:**

A cross-sectional study was conducted in a pediatric urology outpatient clinic in Salvador, Brazil, between January 2017 to January 2019.

**INCLUSION CRITERIA:**

Children aged 4 to 17 years with LUTS with or without constipation. Patients with urinary and/or intestinal anatomical and/or neurological problems were excluded. Dysfunctional Voiding Score System (DVSS) was used to evaluate LUTS. Rome IV criteria were used to evaluate constipation. Transverse rectal diameter, bladder volume, postvoid residual and bladder wall thickness were measured by pelvic ultrasound. Each patient was submitted to two measurements. Volume urinated at the first moment was also measured. Rectal diameter  $\geq 3$  cm was considered increased.

**RESULTS:**

We studied 116 patients. Mean age was  $9,08 \pm 3$  years with 64 (55.2%) patients being male. 65 (56%) Children/adolescents were constipated. Median DVSS was 10 (Q1 6-14) and mean rectal diameter was  $3,03 \pm 0.9$  cm. Increased rectum occurred in 57 (49%) patients. No association was shown between increased rectum and urgency (76,4% X 78,6%,  $p = 0.78$ ), enuresis (73,2% X 76, 3%,  $p = 0.71$ ), pollakiuria (38.6% X 37, 3%,

p = 0.89), nocturia (22.8% X27, 1%, p = 0.59) and constipation (61,4% X50, 8%, p=0,25). There was no correlation between rectal diameter and DVSS (p = 0.57), bladder volume (p = 0.26), postvoid residual (p = 0.22), bladder wall thickness (p = 0.99) and urinated volume at 1st moment (p = 0.52).

#### CONCLUSION:

Rectal diameter is not associated with LUTS and constipation nor it is related to DVSS and vesical ultrasound measurements.

## 6 12:00

### An adolescent 'lived' experience compared with carer 'observed' experience of discomfort during video-urodynamic investigation.

Joanna Clothier, Kay Willmott, Massimo Garriboli,  
Anne Wright, Rebecca Hutchinson,  
Evelina London Children's Hospital; London UK

#### INTRODUCTION AND AIM OF THE STUDY:

To understand from the adolescent perspective the discomfort felt during video-urodynamic investigation (VUD). To identify whether there is a difference in the young person's 'lived' experience compared to the carers 'observation'. Methods Single-centre, prospective, anonymised questionnaire study performed on consecutive VUD in paediatric patients aged 12-19 years and their carers, over a 5 month period. Questionnaire completed immediately following investigation. Specific questions regarding discomfort experienced (patient) and observed (carer) related to all aspects of the study recorded using Likert scale, 1-5 (5 high). Patient and carers asked to rate experience vs expectation 1-5 (5 much worse than expected). Paired t-test used to assess for any differences in discomfort reported between patient and carer. Values expressed as median.

#### RESULTS:

35 questionnaires completed by patients (14 years, 50% male, 3% neuropathic). Pain score: bladder catheter placement 1.5/5, rectal line placement 2/5, holding a void 3/5, voiding 1/5, EMG stickers 1/5, removal of bladder catheter 2/5, removal

of rectal line 2/5. Overall pain score 2/5. Overall experience vs expectation 2/5 (better than expected). 31 paired adolescent and carer questionnaires were returned, no significant difference were found between adolescent and carer discomfort report for rectal line insertion (p=0.69), rectal line removal (p=0.32) and urethral catheter removal (0.21). Interestingly, the discomfort expressed by the adolescent was higher than the one reported by the carer for urethral catheter insertion (p=0.04). Adolescents also rated the overall experience vs expectation worse than their carer (p=0.01).

#### CONCLUSION:

Adolescents express low levels of discomfort during VUD. Although low, the discomfort felt during catheter insertion is underestimated by their carer. The overall experience vs expectation is described better than expected (2/5). However, the experience is rated significantly better by the carer. We should consider seeking experience feedback directly from our adolescent patients.

## 7 12:08

### Does Pelvic Floor EMG Activity Matter In The Creation Of Nomograms And Flow Equations In Adolescent Males?

Jose Murillo Netto<sup>1,2</sup>, Sarah Lambert<sup>2</sup>, Therese Collett-Gardere<sup>2</sup>,  
Kaitllyn Murphy<sup>2</sup>, Adam Hittelman<sup>2</sup>, Israel Franco<sup>2</sup>,  
1. Universidade Federal de Juiz de Fora,  
2. Yale University

#### INTRODUCTION:

A bell shaped flow curve has been designated to represent normal voiders. It believed that if a child does not have LUTS and voids with a bell curve that the pelvic floor EMG is quiet. To our knowledge most uroflow nomograms have been created with uroflows that were performed without pelvic floor EMG's (PFEMG). Our hypothesis is that there is a difference in the flow characteristics of patients with bell shaped curves with a quiet pelvic floor emg and those who have emg activity.

**METHODS:**

A total of 1523 uroflow curves were evaluated. Of these, 87 curves were selected according to inclusion criteria: boys 12-20 years of age, smooth bell shaped curves, Qmax FI between 0.7-1.25, VV > 50 ml, post-voided residual (PVR) < 20 ml, a TBC < 115% of estimated bladder capacity, and a reliable quality EMG signal. 31 of the selected curves demonstrated PFEMG activity and composed the study group (SG). The remaining 56 curves composed the control group (CG). Two-experienced pediatric urologists evaluated all curves.

**RESULTS:**

Mean age was similar between the groups ( $p=0.57$ ). Adolescents with PFEMG activity (SG) did not show any statistically significant difference between Qmax, Qavg, TTQmax, Accel, VV, PVR, Qmax FI, and Qavg FI. When lagtime was measured there was a difference in age noted (15.06 vs 17.21  $P<0.007$ ) with the older patients having longer lagtimes but all other parameters did not exhibit any differences.

**CONCLUSION:**

Unlike in the female counterparts where different flow characteristics were created by PFEMG activity, in the males there was no difference in the usual uroflow parameters. This does not mean that in non bell shaped curves that the effect of the elevated PFEMG may not be significant but in the bell shaped curves in these males it does not tend to alter flows significantly.

**8 12:16****Parents' expectations of the outpatient care for daytime urinary incontinence in children.**

Marleen Linde<sup>1</sup>, Janita Hogenkamp<sup>1</sup>, Gertine Kroes-van Hattem<sup>1</sup>, Ilse Hofmeester<sup>1</sup>, Rien J.M. Nijman<sup>2</sup>, Martijn. G. Steffens<sup>1</sup>, Francis J. Kloosterman-Eijgenraam<sup>1</sup>, Marco H. Blanker<sup>3</sup>,

1. Department of Urology, Isala, Zwolle, the Netherlands,

2. Department of Urology, University Medical Center Groningen, University of Groningen, the Netherlands,

3. Department of General Practice and Elderly Medicine, University Medical Center Groningen, University of Groningen, the Netherlands

**INTRODUCTION:**

Most children with daytime urinary incontinence (UI) who are referred to outpatient clinics start therapy right after their first visit with the aim to stop the incontinence completely. It is unknown if this meets the expectations of patients and parents, as studies on this topic are lacking. Meeting patients' expectations could result in more personal, effective and efficient healthcare. We explored the parents' expectations in this qualitative study.

**METHODS:**

We conducted a qualitative study with semi-structured interviews with parents of children aged four to twelve years old, who were referred for daytime UI (with or without nocturnal enuresis) to our large teaching hospital. Interviews were tape recorded, transcribed verbatim, and analysed with ATLAS.ti 8.3.1 according to Grounded Theory, until saturation was reached.

**RESULTS:**

Nine interviews were completed. Parents reported the wish to know if there is a medical explanation for the UI. Some parents would be satisfied when diagnostics reveal no physical abnormalities, even without any treatment being offered, other parents expected treatment as well. Parents had no clear ideas about diagnostics, the treatment or duration of the trajectory, but they hope that ineffective steps, already taken prior to referral, will not be repeated. Parents expected accessible information on the cause and treatment of the UI. Parents who looked for support expected this to be child-centred. Success was defined by some of the parents as completely dry, while the aim of most of the parents was to learn coping strategies to handle the incontinence.

**CONCLUSION:**

This qualitative study is the first to explore parents' expectations. The expectations of assessment and treatment for daytime UI, and the definition of treatment success differed widely from what was anticipated. Hence, the current healthcare possibly does not meet the expectations of parents. Further research will be performed to quantify these outcomes.

## **The Interrelation of the Transverse Rectal Diameter and Bladder Wall Thickness in Spina Bifida Children with Overactive Bladder and Detrusor Sphincter Dyssynergia: An Accidental or Causal Relation?**

Sasa Milivojevic MD<sup>1</sup>, Ivana Dasic MD<sup>1</sup>, Jelena Milin Lazovic MD<sup>2</sup>,  
Goran Djuricic PhD MD<sup>1</sup>, Goran Djuricic PhD MD<sup>1</sup>,

1. *University Children's Clinic Belgrade, Urology Department,*

2. *Institute for Medical Statistics and Informatics, Faculty of Medicine, University of Belgrade*

### **PURPOSE:**

To prove the interrelation of the transverse rectal diameter and bladder wall thickness in spina bifida children with overactive bladder and detrusor sphincter dyssynergia.

### **MATERIALS AND METHOD:**

The research was carried out over the 2014–2018 period, during which 78 spina bifida children aged 4 to 16 were observed. The patients were on average 8.3 years old  $\pm$  3.4 SD, of whom 38 (48.7 %) were males and 40 (51.3%) females. During the above period, the patients were administered CIC, anticholinergic medication therapy, as well as bowel management with an aim of treating lower urinary tract dysfunction and the accompanying constipation and fecal incontinence. As part of the assessment of treatment results, all the patients underwent echosonographic measurement of bladder wall thickness and transverse rectal diameter, which were subsequently compared mutually. Before echosonographic measurement, the absence of urinary infection needed to be proven in all the patients, which was confirmed by the sterile urine culture results.

### **RESULTS:**

After applying Spearman's correlation coefficient, we ascertained a close, positive and statistically highly relevant interrelation between transverse rectal diameter and bladder wall thickness ( $r=0.925$  ;  $p<0.001$ ). The larger the rectal diameter, the larger the bladder wall thickness was measured.

### **CONCLUSION:**

There is an interrelation between the transverse rectal diameter and bladder wall thickness (the larger the rectal diameter, the larger the bladder wall thickness). Whether they share a common pathophysiological etiology or there is an interrelation of these two entities in spina bifida children should be answered by future studies.

**12:30–13:15 | Kelm Hjälms Memorial Lecture****– Surgical treatment of urinary incontinence in childhood** – Tom de Jong**12:30–13:15 | Introduction:** Rafał Chrzan**13:15–13:35 | POSTER DISCUSSION****1****Leg length discrepancy can be an awareness symptom of bladder dysfunction. Case ended with kidney failure.**Valbona Stavileci<sup>1</sup>, Destan Kryeziu<sup>2</sup>, Diamant Shtiza<sup>3</sup>, Irena Palloshi<sup>3</sup>,1. *University Clinical Centre of Kosova,*2. *Urology Clinic Prishtina,*3. *QSUT Albania***INTRODUCTION:**

Stigma of urinary incontinence is still present. Approximately 6% of patients undergoing renal transplant each year have ESRD due to lower urinary tract abnormality. Orthopedist approach for Lower extremities discrepancy usually is tightly surgical repair, without broader physical examination, which would identify the bladder function problem and preserve kidney function. A boy 16 years, presented with ESRD Cre: 1080 and Urea: 94. Incontinent and constipated, both paretic legs (left shorter with contractures), couldn't walk properly, spinal dysraphism. Leg orthopedic operation three years before presentation. Neurologically FVM gr 3, RTM are lacking. Severe hydronephrotic on ultrasound and with chronic pyelonephritis. Large bladder with 2.5 L urine. Second day after catheterization developed Hemorrhagic cystitis.

**CYSTOMETRY:**

No bladder contraction during feeling. At 500 ml leaked with cough, and on 600 ml leaked continuously. Pressure almost 15 mmH<sub>2</sub>O. No sensation. Bladder cooling test positive. He felt heat water, had pain on feeling, no contraction.

**COLD WATER:**

During feeling no cold sensation, severe pain and contractions (pressure was 58mmH<sub>2</sub>O maximal). Not able to present an uroflow curve, micturation: 80 ml with straining, 525 ml residuals. During CIC he was wet even with 150-200 ml urine.

**MRI:**

Terminal meningocele. Sacrum ends at S2 (partial sacrum agenesis), dural sac is bulging downwards and frontally in a few cysts. It is difficult to exactly see where conus ends and if there is a syringohydromyelia. An indwelling catheter on free drainage is no guarantee of a constantly low intravesical pressure, cause of phasic bladder contractions which occur despite catheter drainage will damage upper urinary tract. Children with NBD require multidisciplinary team care: pediatricians, neurosurgeon, urologist, nephrologists, orthopedics, allied medical specialists.

**TREATMENT AIM:**

To achieve a low-pressure bladder and prevent posttransplant infection.

**OPTIONS:**

*Conservative modalities:* clean intermittent catheterization and bladder relaxants.

*Invasive modalities:* bladder augmentation, intestinal conduit, or external sphincterotomy.

**2****Cystometry findings among children in Kosova, done at the only Urodynamic Center in Kosova during a year.**Valbona Stavileci<sup>1</sup>, Destan Kryeziu<sup>2</sup>,1. *University Clinical Centre of Kosova,*2. *Urology Clinic Prishtina***INTRODUCTION:**

Urodynamic investigations can be helpful to define the prognosis and especially, when we need to select a therapeutic strategy in very resistant cases.

**MATERIAL AND METHODS:**

The study included a number of 30 children with voiding dysfunction symptoms. They were investigated clinically (voiding and defecation history-charts, physical examination) as well as through imaging techniques: renourinary ultrasound, voiding cystourethrography and uroflow and cystometry. Assessing the vesical pressure is very difficult since child moves and this causes a reflex activity of the pelvic floor muscles. Bladder filling is ideally performed by a pump ensuring a sufficiently slow flow rate to avoid modifying bladder behaviour 5ml/min. The following parameters are recorded: baseline detrusor pressure, first desire to void, detrusor activity, bladder capacity and bladder compliance. Measurement of bladder pressure during voiding is used to confirm whether or not the bladder is contractile, assess obstruction in the case of low urine flow rate with high bladder pressure, to detect abdominal straining and residual urine.

**MAIN INDICATIONS:**

Neuropathic bladders, voiding dysfunctions,UTI, anorectal malformations, failure of first-line treatment.

**RESULTS:**

Female vs male presentation was 66%. 39% had complete recommended evaluation before examination. 21% had neurogenic bladder. 33% Overactive bladder. 9% normal cystometry. 91% with residual urine. 9% no residual urine. Small ages were with MMC mostly and with other dysfunctions were above age of 8, spread around 15% of all.

**CONCLUSIONS:**

A specific paediatric procedure should be respected when performing uroflowmetry and cystometry in children. The examination must be interpreted manually without taking into account the automated interpretation.

**A case of complete double pelvis and ureter (ectopic ureter to the external ureteral orifice) found in total incontinence.**

Yasuyuki Naitoh, Jun Ajiki, Yasuhiro Yamada,  
Fimiya Hongo, Osamu Ukimura,

*Kyoto Prefectural University of Medicine, Department of Urology*

**INTRODUCTION:**

In children with urinary incontinence, there are cases caused by anatomical abnormalities. These cases are often diagnosed in urology department. Total urinary incontinence due to ectopic ureter may be difficult to diagnose. We report ectopic ureteral cases that were not diagnosed correctly in several other clinics and finally diagnosed in our clinic.

**CASE PRESENTATION:**

A 4-year-old girl consulted for total incontinence. A medical examination revealed that she had no dry time. The pad test showed that her incontinence was more than 250ml a day. Anticholinergics prescribed at other clinics were totally ineffective. A CT scan showed a left complete double pelvis and ureter. Unfortunately, the ectopic ureteral opening was unclear on CT scan. In DMSA scintigraphy, it was found that the function of the upper kidney also remained. The examination was performed under general anesthesia. The ureter from the upper kidney was open around the external urethral orifice. The ureterocystoneostomy (UCN) was performed. The ectopic ureter was newly anastomosed to the bladder. Postoperatively, the incontinence disappeared completely.

**DISCUSSION:**

A case of complete double pelvis and ureter, the upper kidney function often does not remain. In this case, the function of the upper kidney remained sufficiently. It was necessary to preserve this function and cure incontinence. The UCN was considered to be the most suitable method for such cases.

**CONCLUSION:**

In total incontinence cases, it is important to always consider and diagnose the cause of the anatomic malformation.

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### Late Diagnosed Posterior Urethral Valves.

Maria Daniel, Hanna Szymanik-Grzelak, Anna Wabik,  
Stanisław Warchoń, Małgorzata Pańczyk,

*Department of Paediatric Nephrology, The Medical University of Warsaw, Warsaw, Poland*

#### INTRODUCTION:

Posterior urethral valves (PUV) are obstructing membranous folds within the lumen of the posterior urethra and PUV is the most common etiology of urinary tract obstruction in the newborn male. Most of the cases are being detected during pregnancy through prenatal ultrasound and in the first years of life.

#### MATERIAL:

A 5,5-year-old boy was admitted to the clinic to carry out the diagnosis of nocturnal enuresis (NE) and daily incontinence. NE was primary, it was being effectively prevented by waking up the boy at night while being between 3 and 4.5 years old. The urination control during the day was achieved by him at the age of 2,5. In the last year, there was an increase of NE up to every night and incontinence appeared 5-6 times a day. He has had no urinary tract infection history and the abdominal ultrasound performed in the 2nd year of life was normal.

#### RESULTS:

There were no significant deviations in the physical examination. Diuresis 600 ml/24 h, urination 12-15 times/day, volume 50-120 ml/miction. The following diagnostic tests were performed: morphology, kidney functions, urinalysis – they were normal. Abdominal ultrasound showed kidneys with normal echogenicity and size, both with hydronephrosis, both ureters were dilated and tortuous and thick-walled, trabeculated bladder. Cystography showed elongated, dilated bladder with trabeculation, diverticula and dilated posterior urethra. Uroflowmetry examination: volume of micturation 42 ml, irregular, intermittent curve, normal Qmax, 62 ml of residual urine. Cystoscopy was performed: the massive PUV type I was resected. Bladder was treated with doxazosin for 1,5 years and then tamsulosin continued for the 4 following years.

### CONCLUSIONS:

A normal result of abdominal ultrasound does not exclude the diagnosis of PUV, and the first and only symptom of PUV may be secondary enuresis or increasing of primary urination.

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### Urinary incontinence and related problems in children of Kosova.

Valbona Stavileci<sup>1</sup>, Safete Shala<sup>2</sup>,

1. *University Clinical Centre of Kosova,*

2. *Pediatric Surgery Clinic of Prishtina*

#### PURPOSE:

Urinary incontinence is a major symptom that causes anxiety to children with this problem and their parents, especially mothers. We want to find prevalence of this disorder among our children also identify etiologic factors, coo morbidities associated and risks related to incontinence.

#### MATERIALS AND METHODS:

Patients are followed more than three months. We have done physical and neurological examinations, micturation and defekating observations for three days. Among patients were found disorders we have done.

#### URODINAMIC STUDIES RESULTS:

Enuresis monosimptomtic is found in 28% of cases, with no gender difference and the prevalence decreased with age. Daytime incontinence is found in 28.5% of cases with female dominance. Overactive bladder is found in 1% of cases. Extraordinary frequent urinating Syndrome is found in 0.5% of cases. Coo morbidities related are: constipation 22%, spina bifida 4%, socioeconomic conditions 0.2%, hydronephrosis 7.9%. Conclusion our findings showed that urinary incontinence is a frequent health problem among our children. We have to raise awareness among all levels of health services that in children with these kinds of problems we should do complete physical and neurological examination and if there are indications reefer to specialized center for further special urodynamic examinations.

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## Incidental MRI finding or cause of voiding disturbances? Lumbar intervertebral disk protrusion: review of 4 pediatric cases.

Joanna Bagińska, Alicja Liszewska, Agata Korzeniecka-Kozerska,  
Medical University of Białystok, Poland

### INTRODUCTION AND AIM OF THE STUDY:

Childhood urinary incontinence may be explained mostly by behavioral predispositions. However, less common neurologic conditions should not be forgotten. Some authors described an association between voiding disturbances and lumbar intervertebral disk protrusion.

### MATERIALS AND METHODS:

Retrospective review 2018-2019: 4 cases identified. The children's medical records were analysed to determine kidney and lower urinary tract ultrasound, voiding cystourethrogram, uroflowmetry and urodynamics. Cystoscopy was carried out in male patients. MRI examination of the lumbosacral spine was performed in each case.

### RESULTS:

The main results of the clinical cases are summarised below. The ultrasound, cystourethrogram, cystoscopy did not reveal abnormalities.

**CASE 1:** *Female 8y.o;* LUTS: Infrequent voiding, daytime incontinence (DI), nocturnal enuresis; Uroflowmetry: Normal; Urodynamics: Weak bladder sensation, lack of reflex contraction on coughing, weak detrusor contraction, detrusor sphincter dyssynergia (DSD); MRI findings: Slightly protrusion of the intervertebral disc at L4 /L5.

**CASE 2:** *Female 13y.o;* LUTS: Infrequent voiding + constipation; Uroflowmetry: Intermittent pattern in the flow curve with residual volume; Urodynamics: Weak bladder sensation, lack of reflex contraction on coughing, high detrusor pressure, DSD; MRI findings: Slightly posterior protrusion of the intervertebral disc at L4 /L5.

**CASE 3:** *Male 10y.o;* LUTS: DI, involuntary leakage of urine; Uroflowmetry: Intermittent pattern in the flow curve; Urodynamics: Weak detrusor contraction; MRI findings: Posterior protrusion of the intervertebral disc at L4 /L5.

**CASE 4:** *Male 13 y.o;* LUTS: DI, involuntary leakage of urine; Uroflowmetry: Intermittent pattern in the flow curve with residual volume; Urodynamics: Weak bladder sensation, lack of detrusor contraction, abdominal voiding; MRI findings: Protrusion of the intervertebral disc at L4 /L5 with modulation of dural sac.

### CONCLUSIONS:

We believe that voiding dysfunction is secondary to the protrusion of the intervertebral disc in our patients. It should be taken into consideration in the differential diagnosis in a patient with urinary incontinence.

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## Bilateral single ectopic ureters with hypoplastic bladder: How should we treat these challenging entities? a follow-up report.

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2. Department of Pediatrics, Shiga University of Medical Science

### INTRODUCTION AND AIM OF THIS STUDY:

Generally bilateral single ectopic ureter with hypoplastic bladder (BSEU) is rare and difficult to treat. In 2007 we reported a case with BSEU treated by staged operation without urinary diversion or bladder augmentation. To increase capacity of the hypoplastic bladder, we performed side-to-side anastomosis between the dilated ureter and the lateral wall of the bladder. Eight months later we successfully performed bilateral ureterocystoneostomy with or without ureteral folding. Postoperative VCUG showed no reflux 6 months after the operation (*J Pediatr Urol* 3:243-246, 2007). Here, we would like to present a follow-up report about a long-term consequence of renal and bladder function of BSEU.

### CASE HISTORY:

At the age of 2 videourodynamic study (VUDS) showed relapse of right VUR. At the age of 3 and 8, endoscopic corrections using Deflux were done because of repeated febrile urinary tract infection. At the age of 10, DDAVP and anti-cholinergic agent and enuretic alarm treatment were started for the treatment of day time wetting and enuresis. At the age of 12, VUDS showed low compliant bladder, 136ml/29cmH20, compliance 5.64, and no VUR and no detrusor overactivity were noted. Daytime wetting resolved after puberty. At the age of 13, 99mTc-DMSA renal scintigraphy showed no new renal scars on both kidneys. At the age of 14, laboratory data

showed CKD stage 2: serum Creatinine 0.69mg/dL, eGFR 88.68mL/min/1.73m<sup>2</sup>. At the age of 15, uroflowmetry demonstrated bell flow pattern: flow index 0.774, Q<sub>max</sub> 16.6ml/s, Q<sub>ave</sub> 4.9ml/s, VV 145ml, and RU 17ml. Ultrasound showed bilateral SFU G2 hydronephrosis. Although she wets the bed once every three days, she uses enuretic alarm without medication. Antibiotics is sometimes needed for symptomatic cystitis.

#### CONCLUSION:

Ureterovesicostomy and ureterocystoneostomy is a feasible method to prevent kidney damage and urinary incontinence for bilateral single ectopic ureters with hypoplastic bladder.

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### Improving results of colcystoplasty – Some practical lessons learnt along the way.

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*Lilavati Hospital & Research Centre, Mumbai, India*

#### AIM:

To discuss some practical modifications and measures which have helped improve the results of colcystoplasty.

#### MATERIALS AND METHODS:

A retrospective study of 40 cases of colcystoplasty was done and observations made regarding the five parameters which are as follows:

1. Bowel preparation
2. Bowel segment tubularization and configuration
3. Leaks prevention
4. Ureteric catheters
5. Postoperative catheter care Based on these observations, the case-cohort/series could be divided into two groups as phase 1 (2005-2010) and phase 2 (2010-2015).

In phase 1 patients underwent a more thorough bowel preparation with PEGLEC (Polyethylene glycol) preparation, detubularized with cap type of configuration,

no special attention was given to check for leaks after augmentation, ureteric catheters were kept in situ post-operatively for 5 days and no special care of indwelling tubes was taken postoperatively (kept without kink prevention methods).

In phase 2 patients underwent bowel preparation by rectal washouts, the harvested segment was reconfigured into a patch rather than a cap, meticulous check of leaks was done after colcystoplasty, indwelling ureteric catheters were not kept and special kink prevention methods were used for all the indwelling catheters.

#### RESULTS:

1. Non-usage of Polyethylene glycol bowel preparation did not affect the outcome.
2. "Cap" configuration gave rise to an hourglass type of augment but "Patch" reconfiguration avoided the same.
3. Meticulous check for leaks at the end of augmentation-anastomosis decreased the postoperative leaks significantly.
4. Leaks were seen only in patients with indwelling ureteric catheters and not in the patients where ureteric catheters were not used. Without indwelling ureteric catheters, the augmentation was kept flushed with urine which dissolved the mucus, ensuring better emptying of neobladder.
5. Simple techniques to prevent the kinking of indwelling catheters postoperatively results in decreased leaks and complications.

#### SUMMARY:

These issues will be presented with examples in the presentation.

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### Copeptin - possible marker of primary monosymptomatic nocturnal enuresis?

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2. Department of Laboratory Diagnostics and Clinical Immunology of Developmental Age, The Medical University of Warsaw, Warsaw, Poland

**INTRODUCTION:**

Bladder neck hypertrophy may be primary or secondary to the anatomical obstruction of the bladder. Alpha1- blockers are used in the treatment of bladder neck obstruction in children. The effect of the doxazosin on urodynamic parameters and clinical signs in children with primary bladder neck hypertrophy (PBNH) were studied.

**METHODS:**

A single center retrospective analysis was carried out. During a 5-year period, 46 (45 boys, 1 girl) out of 738 children with micturition disorders, were PBNH diagnosed. In children with PBNH cystography and cystoscopy were performed before treatment and abdominal ultrasound, uroflow and urodynamic studies were conducted pre- and post-treatment. Selected patients were administered doxazosin 1.0±0.4 mg/day. Primary outcome was to evaluate the efficacy of PBNH treatment with alpha1-blocker in children.

**RESULTS:**

Symptoms of PBNH in children were: urinary tract infections (63.0%), nocturia (17.4%), difficulty with micturition (13.0%), urgency/frequency (21.4%), urinary tract dilatation (26.0%), vesico-ureteral reflux (45.6%). Leak point pressure (LPP) was mean 62.3±26.3 cm H<sub>2</sub>O, Pdetmax was mean 93,6±29,5cmH<sub>2</sub>O, Qmax was mean 14.7±5.5ml/s. In 30% of children, mean 40 ml of residual urine after micturition was found. In the cystoscopy, PBNH was diagnosed without the anatomical obstruction of the bladder outlet. Doxazosin was used for mean 27.7±20.6 months. In all children: disappearance of nocturnal enuresis, difficulty in starting micturition and frequency; resolution of vesico-ureteral reflux (47.6%) and residual urine after micturition (86%); decreasing of mean LPP from 62,3 to 51,4 cm H<sub>2</sub>O and mean Pdetmax from 93,6 to 65,5 cm H<sub>2</sub>O, increasing mean Qmax from 14,7 to 18,6 ml/s was observed.

**CONCLUSIONS:**

Doxazosin is effective in reducing bladder outlet hypertrophy on pressure flow studies and clinical signs in children with primary bladder neck obstruction.

**Anterior Rectus Fascia Slings (ARFS) for Bladder neck tightening (BNT).**

Santosh Karmarkar, Vinod Raj, Anant Bangar,

*Lilavati Hospital & Research Centre, Mumbai, India*

**AIM:**

1. To highlight the use and success of ARFS in management of Urinary Incontinence
2. To discuss the evolution of our technique for harvesting and securing slings.

**MATERIALS AND METHODS:**

14 cases (11 spina bifida, 2 sacral agenesis, 1 exstrophy) were retrospectively analyzed and outcomes evaluated for indications, technique and results. Leak point pressure (LPP) and dry interval (DI) was noted in all patients. The patients underwent BNT either alone or with augmentation and mitrofanoff. Follow up ranged from 3 months to 6 years assessing post-operative LPP and DI.

**OBSERVATIONS AND RESULTS:**

Mean preoperative LPP and DI was 30 cm of water and 40 minutes respectively. Under vision dissection and tunnelling technique was used for ARFS. Initially, the sling was harvested as a free graft and secured to pubic symphysis in 2 cases. Later a pedicled graft was secured to opposite pubic ramus in 6 cases. In our last 6 cases, a pedicled ARFS was brought all around BN and secured on the same side.

**CONCLUSIONS:**

ARFS is a predictable, non-blind and technically easy procedure for BNT. In order to achieve a more complete wrap (270-360 degree), it is better to suture a pedicled sling onto the same side. If stitched to pubis, ARFS may loosen over time. ARFS is able to adequately increase bladder outlet resistance in most cases.

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### Evaluation of developmental characteristics of dysfunctional voiding – Examination of ADHD and WISC-IV.

Yuta Ohnuki, Tsuneki Watanabe, Chisato Oyake, Masaki Fuyama, Hirokazu Ikeda, Showa University Northern Yokohama Hospital, Department of Pediatric, Yokohama, Japan

#### BACKGROUND:

Children with dysfunctional voiding have a high prevalence of developmental disorders, and treatment of dysfunctional voiding in children with developmental disorders is difficult. Wechsler Intelligence Scale for Children Fourth Edition (WISC-IV) was performed on patients with comorbid dysfunctional voiding and attention deficit hyperactivity disorder (ADHD).

#### OBJECTIVE:

To evaluate the relationship between dysfunctional voiding and intelligence in children with ADHD.

#### MATERIAL AND METHOD:

The subject is a child with ADHD who visited our hospital with chief complaint of dysfunctional voiding. We investigated the heir DVSS and WISC-IV. We investigated the relationship between their score of DVSS and WISC-IV.

#### RESULTS:

A total of 11 patients were included, of which 4 were female and 7 were male and the average age of the patients was  $8.6 \pm 1.68$  years (range: 7 - 12 years). The average of score of DVSS was  $7.9 \pm 3.04$  (range: 4 - 12). The average of FSIQ was  $105.6 \pm 14.5$  (range: 87 - 139). The other scores were not correlated with DVSS, but the score of block design was correlated with DVSS (Correlation coefficient 0.677,  $p=0.022$ ).

#### CONCLUSION:

Dysfunctional voiding in children with ADHD is likely to be more severe as the score of block design is higher.

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### Translation and cross-cultural adaptation of the Childhood Bladder and Bowel Dysfunction Questionnaire (CBBdq) in Brazil.

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1. Clinica Nefrokids Curitiba/Brazil, 2. Universidade Federal do Paraná/Brazil, 3. Faculdade Inspira e Clinica Nefrokids-Curitiba/Brazil, 4. Maastricht University Medical Center

#### PURPOSE:

To translate and culturally adapt the Bowel Dysfunction in Childhood Questionnaire (CBBdq) into Brazilian Portuguese. To offer Brazilian professionals and researchers, an easy way to evaluate the frequency of symptoms of CBBd.

#### MATERIALS AND METHODS:

After permission to translate the CBBdq into Brazilian Portuguese from Dr. Marieke van Engelenburg-van Lonkhuyzen, 18-item CBBdq was translated according to a standard methodology: translation, synthesis, back-translation, Expert Committee, and pre-testing. After the translation the process the final version was pre-tested. Patient responses were analyzed to identify necessary modifications. Reliability was evaluated using the test-retest method.

#### RESULTS:

73 children/parents participated in the study, 44 female with a mean age of  $7.6 \pm 2.1$  years. The intraclass correlation coefficient (ICC = 0.94) showed high interobserver reproducibility.

#### CONCLUSIONS:

BBD is a common clinical problem in pediatric urology patients. With a heterogeneous spectrum of symptomatology, BBD may consist of lower urinary tract symptoms of storage and emptying and abnormal bowel patterns. Children presenting with BBD are more prone to UTI, urinary incontinence, and VUR. Recently, the pediatric urology community has worked to develop questionnaires that might help to quantify BBD symptoms reliably and accurately. The cross-cultural adaptation process of the CBBdq will be a useful tool in the Brazilian pediatric urology clinical setting since the scoring system includes questions about the storage/emptying phases of micturition and bowel functions.

### Cowper's syringocele and posterior urethral valves: an unusual association.

Dario Guido Minoli, Alfredo Berrettini, Erika Adalgisa De Marco, Michele Gnech, Gianantonio Manzoni,

UOC Urologia Pediatrica - Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy

#### INTRODUCTION AND AIM OF THE STUDY:

Cowper's syringocele (CS) is a rare disease with an incidence of 0.1-0,06% in the pediatric population. Its association with posterior urethral valves (PUV) has been only occasionally reported. The aim of this study is to present our experience.

#### PATIENTS AND METHODS:

We retrospectively reviewed all medical charts of patients diagnosed with PUV at our Department between May 2009 and October 2018.

#### RESULTS:

5/122 patients (4%) presented a CS associated with PUV. Table below reports patients data on prenatal diagnosis, fetal treatment, post-natal diagnosis and renal function. In 4 patients the correct diagnosis was reached shortly after birth while 1 patient initially treated elsewhere, reached later the correct diagnosis. None had CS diagnosed within the MCUG (3 SP sovra-pubic cystostomy vs 1 TU trans-urethral catheter), while in all the patients CS was confirmed only during cystoscopy.

Pt	Prenatal Diagnosis (GA week)	Oligoidramnios	Fetal Surgery Vesico-Amniotic Shunt	MCUG (diagnosis)			Endoscopic Diagnosis (PUV and/or CS)	Creatinine Birth (NV 0,1-0.6 mg/dL)	Creatinine
				VUR	PUV	CS			
1.	19+2	YES	VAS 20 weeks	DX (sovrappubic catheter)	YES	NO	PUV-CS	0,8	3,3
2.	23+5	NO	NO	NO (trans-urethral catheter)	YES	NO	PUV-CS	0,8	0,2
3.	23	YES	VAS 24 weeks	BIL (sovrappubic catheter)	YES	NO	PUV-CS	2,4	1,7
4.	16	NO	NO	Failed attempt			PUV-CS	(nd)	0,2
5.	Not available*		NO	DX (sovrappubic catheter)	YES	NO	PUV-CS	0,3	0,3

\* Patient underwent bilateral ureteric reimplantation - PUV resection at 16 mos. For recurrence UTI and persistent disuria he referred to our centre. ° After CS resection symptoms have disappeared. Conclusion: The diagnosis of CS associated with PUV may be very challenging before valves resection. In our experience endoscopic evaluation was fundamental and neonatal sovrappubic cystostomy (vs transurethral catheter) is preferable leaving intact the urethral anatomy but diagnosis through MCUG remain difficult.

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### Neuropathic bladder in children in a developing country: experience and outcomes with minimum five-years follow-up.

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*Division of Pediatric urology, Indraprastha Apollo Hospital, SaritaVihar, New Delhi, India*

#### AIM:

To evaluate the presentation of neuropathic bladder, its complications and stages of renal damage.

#### METHODS:

All children with symptoms of wetting and recurrent UTI who were diagnosed with neuropathic bladder from January 2003 to December 2018 were enrolled in the study. Patients with less than five years in follow up were excluded from the study. Diagnostic work-up included ultrasonography, voiding cystourethrogram, uroflowmetry, urodynamic studies, X-ray lumbosacral spine and MRI spine. Factors which were analysed were disease demography, treatment modalities, surgical interventions needed, progression of renal deterioration and overall outcome.

#### RESULTS:

From 2003 to 2018, 212 patients with neuropathic bladder presented in our department at a tertiary care hospital in northern India. Out of these 212 patients 156 patients had more than five years' follow-up and regular in treatment. Fourteen patients presented with chronic renal failure. 82 patients had neuropathic bladder secondary to neural tube defects, 25 were secondary to posterior urethral valves, 15 were neuropathic bladder associated with anorectal malformation, 6 were secondary to trauma, 5 had neuropathic bladder due to tethered cord, 5 had sacral agenesis and 18 had non-neurogenic neuropathic bladder. 83 (53%) patients are on clean intermittent catheterization (62 through native urethra and 21 through Mitrofanoff's channel). Among those who underwent surgery, 12 underwent augmentation ileocystoplasty, 9 underwent isolated Mitrofanoff's procedure, three patients each underwent vesicostomy and refluxing lateral ureterostomy. Four patients underwent renal transplant and three patients died during follow up. Mean follow up is 96 months with a (range 64 to 189 months).

#### CONCLUSION:

Anti-cholinergics and CIC are the mainstay of management. The subset of patients with refractory neuropathic bladder who require surgical management can be managed by minimally invasive approach. Ileocystoplasty in about 10% and other surgeries in another 10% with medical therapy has successfully preserved renal function.

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### A New Perspective in Nocturnal Enuresis Treatment: A Pilot Study.

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2. *Department of Child and Adolescent Psychiatry, Abant İzzet Baysal University Faculty of Health Sciences, Bolu, Turkey*

#### CONTENTS OF THE ABSTRACT :

Many studies related to children with nocturnal enuresis (NE) have shown that maturation has been delayed. Also, it has been shown that children with primary monosymptomatic nocturnal enuresis (PMNE) have short-term memory and cognitive dysfunctions. One of the pathophysiology of NE is known to disturbed sleep and arousal. A recent study reported that children with sleep disturbances had a weak dual task performance. Based on these information; the aim of this study was to investigate the effect of a new treatment protocol for children's with PMNE on quality of life and symptom severity.

#### SYMPTOM SEVERITY WITH BLADDER AND BOWEL DYSFUNCTION:

Questionnaire and quality of life with Continence Specific Pediatric Quality of Life Measurement Tool of 15 children were evaluated before and after treatment. Treatment program was 45 minutes a day, 1 day a week and 8 weeks. This new treatment protocol included the use of "dual task exercises" to improve cognitive dysfunction, "repetition without repetition exercises" to improve maturation delay, pelvic floor muscle training with EMG-Biofeedback to improve pelvic floor muscle activity. In the "dual task exercises", children were asked to solve mathematical

problems or tell a story during exercise. The “repetition without repetition exercises” were performed different types of core stabilization exercises. Children’s quality of life and symptom severity were 35.33 and 12.20 before treatment, and were 12.33 and 8.06 after treatment, respectively. After treatment, children with PMNE had improvement in urinary incontinence related quality of life ( $p=0.001$ ) and symptom severity ( $p=0.001$ ). This study showed that in the PMNE treatment; “dual task exercises”, “repetition without repetition exercises”, pelvic floor muscle training with EMG-Biofeedback have been shown to be effective in improving the quality of life and symptom severity of children.

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### Long term observations of patients after constructions of continent faecal stoma.

Lidia Skobejko-Wlodarska,

*Childrens Memorial Health Institute, Department of Paediatric Urology, Warsaw, Poland*

#### AIM:

To evaluate the Malone method of continent faecal stoma construction for antegrade enemas with special consideration of complications.

#### MATERIAL & METHOD:

Since October 1998 to June 2017, 132 patients with severe constipation or faecal incontinence underwent the Malone procedure for bowel management. Central nervous system impairment was the main cause of bowel dysfunction. The group consisted of 110 MMC (83%) and 22 (17%) patients after reconstructions of anal atresia. Concomitant procedures performed with faecal continent stoma were: continent urinary stoma in 83, continent reservoir with bladder neck closure in 14, bladder augmentation in 40 and Bricker procedure in 8 patients. Appendix was mainly used for stoma formation. In 28 cases it was divided in two parts (one for faecal and one for urinary stoma). In case of lack of appendix a patch from caecum or descending colon was used in 9 patients. Opening of the stoma was usually localized in the umbilicus, when two stomas were constructed one was situated in the umbilicus and the other in the right iliac fossa. Wash out of the faecal masses was introduced 3 weeks after

operation. Solution for the enemas was 300-500 ml of rectanal mixed 1:1 with 0,9% NaCl. In the early postoperative period stoma needed calibration by the patient twice a day. In the first week enemas were performed every day and after every second day.

#### RESULTS:

Observation period ranges from 1 to 20 years. The most serious early complication was detachment of the stoma from abdominal wall and migration to the pelvis with abscess formation in a patient with severe bone deformation. In the late follow up main complication observed was the stenosis of the cutaneous opening of the stoma, which occurred in 11 patients. In 4 patients it was enough to introduce regular calibrations of the stoma. In 2 patients local steroid injections were used. One patient demanded indwelling catheter in the stoma. In 4 patients stoma was lost due to rare use. Misplaced catheterization in 3 patients led to perforation of the stoma channel and extravasation of the enema fluid into subcutaneous tissue. In another 2 patients to deep insertion led to knotting of the catheter. In 1 patient open revision was needed because of leaky stoma channel, In another appendical invagination into caecum was observed and in other two excessive mucosa. All of them needed surgical proceeding. The rest 108 patients didn't present any complications. Two patients of them in adult period got severe damaged of continent faecal stoma because of its improper management by incompetent surgeon. Currently, 106 patients remain without any complications,

#### CONCLUSIONS:

1. Continent faecal stoma is a helpful solution in patients with faecal impaction due to nervous system damage.
2. Most of the complications in pediatric period are related to improper use of the stoma by the patient. It can lead to severe and permanent damage of the stoma.
3. Most of complications in adult period are related to lack of professional knowledge about Malone procedure at some surgeons or urologist.

### 13:15–13:35 | Enuresis new understanding as a multifactorial condition.

Soren Ritting, *Aarhus University*

**15:00–15:20 | ENURESIS TREATMENT – STATE OF THE ART.**Konstantinos Kamperis, *Aarhus University***SESSION 3 - ENURESIS****1** 15:20**Rapid maxillary expansion in children with nocturnal enuresis: a randomized placebo-controlled trial.**Ingrid Jönson Ring<sup>1</sup>, Farhan Bazargani<sup>2</sup>,  
Agneta Markström<sup>3</sup>, Tryggve Nevéus<sup>1</sup>,1. *Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden,*2. *Department of Orthodontics, Postgraduate Dental Education Centre,  
Public Dental Service, Region Örebro County, Örebro, Sweden and School  
of Health and Medical Sciences, Örebro University, Örebro, Sweden,*3. *Department of Medical Sciences, Lung, Allergy, and Sleep Research,  
Uppsala University, Uppsala, Sweden***INTRODUCTION AND OBJECTIVE:**

The orthodontic technique rapid maxillary expansion (RME) has been reported to have a potentially curative effect on nocturnal enuresis (NE). The mechanism behind this is unknown but could possibly be due to placebo and/or effects on respiration during sleep. The aim of our study was to investigate whether RME is a useful therapy for NE and if the treatment effect is due to placebo. Our study also aims to identify prognostic variables and evaluate the effect RME may have on respiration during sleep in enuretic children.

**METHOD:**

38 children with therapy-resistant NE were recruited and randomized into two groups, either the intervention group or the placebo group. Both groups were treated with RME, but the placebo group received treatment with a sham appliance for two weeks before having the actual treatment. A medical history focused on micturition habits, previous treatment, heredity and sleep disorders was taken. Cardiorespiratory polygraphic sleep registrations were carried out 3 times; at baseline (T0), during RME (T1) and six months after RME (T6).

**RESULTS:**

There was a statistically significant reduction of wet nights after the RME treatment (p50%). Large voided volume and a wide maxilla at baseline had a strong association with the favorable treatment outcome. There was a significant difference in sleep efficiency between the three measures. (P=0.001) The mean hypopnea index was 0.3, 0.5 and 0.2 at T0, T1 and T6 respectively. These changes were statistically significant. (P=0.005) The majority of the children did not have SDB in addition to their nocturnal enuresis.

**CONCLUSION:**

RME has a modest effect on children with therapy-resistant NE. The treatment outcome does not seem to be due to a placebo effect of the appliance.

**2** 15:28**Olfactory performance in children with incontinence.**Hannah Mattheus, Justine Hussong, Christina Pan, Alexander von Gontard,  
*Department of Child and Adolescent Psychiatry, Saarland University Hospital, Hamburg, Germany***INTRODUCTION:**

Normal olfactory functioning is related to quality of life, emotions, cognition and memory. Abnormal olfactory functioning occurs in neurodegenerative diseases (e.g. Alzheimer's and Parkinson's disease) and in many neurodevelopmental/psychiatric disorders (e.g. Attention deficit hyperactivity disorder, Autism Spectrum Disorder). Olfactory functioning is processed predominantly by frontal regions, but also by temporal regions and therefore, indicates conclusions regarding information processing at different points of the olfactory pathway. So far, olfactory functioning has not been examined in patients with incontinence. As central nervous system functions are also involved in incontinence, the aim of the study was to examine olfactory functions as a potential neurobiological correlate for incontinence.

**METHODS:**

This study included children with daytime urinary incontinence (DUI), nocturnal enuresis (NE) or fecal incontinence (FI) between 6-18 years of age that were treated at the specialized outpatient clinic for incontinence as well as typically developed children (healthy controls-HC). Olfactory functioning was assessed at baseline (t1), after 3 months (t2) and after 6 months (t3) by the Sniffin' Sticks standardized olfactory test battery, including 3 different subtests for olfactory performance.

**RESULTS:**

So far, 40 patients (26 male, mean age=8.8 years) of whom 26 had NE, 12 had DUI and 6 had FI as well as 27 HC (8 male, mean age=11.5 years) completed the olfactory testing at t1. When comparing patients and HC there was a significant lower olfactory threshold ( $p=.010$ ) and discrimination performance ( $p=.004$ ) in patients. Children with only NE showed a significant lower discrimination performance ( $p=.004$ ) and a marginal lower olfactory threshold ( $p=.056$ ) compared to HC.

**DISCUSSION:**

Investigation of olfactory functioning is a feasible and non-invasive method to assess frontal neurobiological correlates in children with incontinence. Children with incontinence showed a worse olfactory threshold and discrimination performance compared to HC, indicating potential differences in frontal processing or neuronal networks specific to incontinence.

**3** 15:36

### **Pretreatment morning urine osmolality predicts oral desmopressin lyophilisate treatment outcome in patients with primary monosymptomatic enuresis.**

Slaven Abdovic, Antonella Geljic, Iva Hizar, Dora Pisppek, Mirjana Stanic, Martin Cuk,

*Department of Pediatric Nephrology, Children's Hospital Zagreb, Croatia*

**AIM:**

To determine the association between urine osmolality in patients with primary monosymptomatic enuresis (PME) and their response to desmopressin. We hypothesized that pretreatment morning urine osmolality is higher in PME patients with desmopressin treatment failure compared to cases with partial or complete initial success.

**METHODS:**

This was a prospective case-controlled study which included 332 patients with enuresis seen in our outpatient clinic between October 2017 and February 2019. Patient workup included symptom checklist, frequency voiding diary, kidney and bladder ultrasound scan, uroflow, urine analysis and culture, urine Ca/creatinine, and first-morning urine osmolality. Patients <5 years of age, with secondary enuresis, and those who did not show at the follow-up visit were excluded. Oral desmopressin lyophilisate was recommended to all patients with PME and normal bladder capacity. After one month of therapy, initial success was assessed according to ICCS. After tests for normality of distribution, the difference of mean urine osmolality between patients with treatment failure and success was analyzed using the unpaired two-sample t-test.

**RESULTS:**

There were 38 patients with PME who received desmopressin and were followed for treatment success. There were 8 patients with initial success categorized as none and all were boys. A partial or complete response to desmopressin was seen in 30 patients of whom 17 were boys (57%). There was no difference in mean age between groups, with  $6.0\pm 1.1$  and  $7.0\pm 1.8$  years for failure and desmopressin response, respectively. Mean urine osmolality was statistically significantly higher in patients with treatment failure ( $916\pm 150$  mOsm/kg) compared to patients with partial or complete initial success ( $790\pm 184$  mOsm/kg), with  $p=0.042$ .

**CONCLUSION:**

For PME patients with high pretreatment morning urine osmolality, an alternative treatment to desmopressin should be considered because of the significantly higher risk of treatment failure.

**4 15:44**

### **Full unattended ambulatory polysomnography in healthy 7-14-year-old children – feasibility and intraindividual variability in sleep parameters.**

Malthe Jessen<sup>1</sup>, Konstantinos Kamperis<sup>1</sup>, Birgitte Mahler<sup>1</sup>, Poul Jørgen Jennum<sup>2</sup>, Søren Rittig<sup>1</sup>,

1. *Department of Pediatrics and Adolescent Medicine, Aarhus University Hospital, Aarhus, Denmark,*
2. *Danish Center for Sleep Medicine, Department of Clinical Neurophysiology, Rigshospitalet, Copenhagen, Denmark*

#### **INTRODUCTION :**

Polysomnography (PSG) is the “Golden standard” of sleep evaluation. We aimed to test if this ambulatory PSG method was feasible in healthy children from age 7 to 14 and to evaluate the intraindividual variability.

#### **MATERIALS AND METHOD:**

Healthy children between the age of 7 and 14 years underwent two nights of full ambulatory PSG at their homes. The participants were requested to register their nocturnal urine production, sleep time, number of awakenings and score the sleep quality each study night. Moreover, one-week home recordings of nighttime urine production were performed prior to the first night. The feasibility of the method was tested by assessing the quality of the PSG data and how the equipment affected different parameters of sleep registered at home with a special focus on urine production.

#### **RESULTS:**

33 children (12 girls) participated in the study and there was only one drop out (girl). Satisfactory signal (>95% of recording time) was obtained in more than 90% of the EEG, oculometry, EMG and respiratory effort recordings. Airflow recordings were adequate in 67% of the study time. These results are comparable to results in adults from home PSG. We found that there was no difference in the nocturnal urine production between test nights and normal nights. Children slept significantly shorter on test night (8.9 +/- 1h vs 9.4 +/- 0.9h) and had significantly more awakenings on test nights (0.4 +/- 0.6 vs 0.09 +/- 0.1). We found no difference between the two test nights in any of the parameters.

#### **CONCLUSION:**

It is feasible to use ambulatory PSG to test the sleep of healthy children between the age of 7 and 14. The extent to which PSG monitoring per se is influencing sleep is debatable. The nocturnal urine production does not seem to be affected by ambulatory PSG monitoring.

**5 15:52**

### **Feasibility of a wearable ultrasonic bladder sensor for monitoring of night-time bladder filling at home in children with enuresis.**

P.G. van Leuteren<sup>1,3,4</sup>, W.M.J. Kwinten<sup>1,3</sup>, M. Van Duren - Van Iersel<sup>2</sup>, P. Dik<sup>1</sup>, P. Jira<sup>5</sup>

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3. *University of Twente, Enschede, The Netherlands,*
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5. *Jeroen Bosch Hospital, Dept. of Pediatrics, 's-Hertogenbosch, The Netherlands*

#### **INTRODUCTION:**

Enuresis is a common problem in children. One treatment option is a wetting alarm which provides an alarm when incontinence occurs. A drawback of this approach is that the child is still awoken by wet sheets. Recently, a wearable, wireless ultrasonic bladder sensor became available, the SENS-U, which has the potential to prevent the enuretic event by waking up the child before the bladder is full. In this study, the aim is to perform a night-time, home-based evaluation of the SENS-U in children with monosymptomatic enuresis (MNE).

#### **PATIENTS & METHODS:**

In this study, children (6-12 years) with MNE were included for a one night monitoring session. During the night, the SENS-U continuously (i.e. every 30 s) estimated the filling status [notifications were deactivated]. In addition, urine volume was collected in a measurement cup (or diaper weight). The total measured nocturnal natural bladder filling (NNBF) cycles was analysed by descriptive statistics. Before and after the measurement, sleep behaviour was assessed by a selection of the Children's Sleep Habits Questionnaire.

**RESULTS:**

15 patients (boys/girls: 13/2) [mean age:  $8.6 \pm 1.5$  years] have been enrolled. One patient was excluded due to inadequate sensor-to-skin contact. For 14 children, 18 NNBF cycles were recorded (voiding diary) of which three patients (21%) had more than one NNBF cycle. The SENS-U was able to successfully detect 83% ( $n = 15/18$ ) of the NNBF cycles. The three missed NNBF cycles had a voided volume  $\leq 30$  ml, which was at the lower limit of the sensor's detection range. The SENS-U had no effect on sleeping behaviour.

**CONCLUSIONS:**

The SENS-U was able to monitor the nocturnal bladder filling successfully in children with monosymptomatic enuresis at home, without disturbance of their sleep behaviour. Future research will focus investigating the usability of the SENS-U for both diagnostic – and treatment purposes.

**6** 16:00

**Nocturnal polyuria predicts improvement of the response rate to the combination therapy (desmopressin and oxybutynin) compared with desmopressin alone in patients with primary monosymptomatic nocturnal enuresis.**

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*Department of Woman, Child and of General and Specialized Surgery,  
Università degli Studi della Campania "Luigi Vanvitelli", Napoli, Italy*

**INTRODUCTION:**

Combination therapy (CT) (desmopressin+oxybutynin) has been considered for primary monosymptomatic nocturnal enuresis (PMNE).

**OBJECTIVES:**

To evaluate the response rate to CT (primary outcome) and to identify factors determining improvement of response compared with desmopressin alone (secondary outcome).

**METHODS:**

We prospectively enrolled children with PMNE with absent/partial response to 240mcg/day of desmopressin after 3months of treatment. The enrolled children continued 240mcg/day desmopressin and started evening administration of 0.3mg/kg/day oxybutynin. A follow-up was scheduled at 3 and 6months after the beginning of CT. At 3months oxybutynin dose was augmented until 0.5mg/Kg in case of absent/partial response to CT. Nocturnal diuresis was measured in 5 wet nights prior the beginning of therapy with desmopressin. Nocturnal polyuria (NP) was defined as nocturnal urine production  $>130\%$  of the expected bladder capacity. All patients with constipation were treated with macrogol.

**RESULTS:**

We enrolled 76 children (36.2% females) with a mean age of  $8.4 \pm 2.4$ yr. After desmopressin treatment, 59/76 (77.6%) patients had partial response, the other didn't show response. After the CT, 68/76 (89.5%) patients showed a response (67.1% full; 22.4% partial). 56/76 (73.7%) patients showed an improvement of the response with CT compared with desmopressin alone (4 patients passed from absent to partial, 6 from absent to full, 46 from partial to full). The factors associated with an improvement of the response to CT compared with desmopressin alone were constipation treatment (OR=3.79; 95% CI: 1.12-12.7;  $p=0.03$ ), one night with NP (OR=5.5; 95% CI: 1.27-24;  $p=0.01$ ),  $>1$  night with NP (OR=5.9; 95% CI: 1.13-30.6;  $p=0.02$ ) and  $>3$  nights with NP ( $p=0.005$ ). For this last group the OR weren't calculable because all the patients had improvement in the response.

**CONCLUSION:**

The response rate to CT is good. The significant predictive factor of improvement of the response to CT compared with desmopressin alone was presence of NP. We hypothesize that oxybutynin determines increased nocturnal bladder capacity increasing possibilities of response. Similarly, the constipation resolution increases bladder capacity.

**6** 16:08**Understanding of and misconceptions around monosymptomatic nocturnal enuresis: findings from patient and physician surveys.**

Michal Maternik, Ilona Chudzik,

*Department of Pediatrics, Nephrology and Hypertension,  
Medical University of Gdansk, Poland***BACKGROUND:**

Monosymptomatic nocturnal enuresis (MNE) is a common pediatric condition, caused by the interaction of multiple physiological mechanisms. The condition can lead to psychiatric comorbidities that are detrimental to quality of life but is under-recognised and misunderstood by society and healthcare providers.

**OBJECTIVE:**

The objective of this study was to gather information from non-specialist physicians and patients on their understanding of enuresis in selected European countries.

**MATERIALS AND METHODS:**

Between June 2016 and March 2017, physicians and patients in several European countries were asked to complete different surveys on their understanding of the medical condition, its impact on the lives of patients and the prevalence of comorbidities. Survey responses were collated, and data were presented descriptively.

**RESULTS:**

Overall, 261 physicians and 340 patients completed their respective surveys. Most physicians (67%) believed MNE to be caused by circadian variation of antidiuretic hormone but also mentioned psychological factors as a cause (48%). The most common explanation for MNE given by patients was psychological factors (26%). For patients, difficulties related to enuresis were often behavioral (77%), including difficulties at school (61%) and with sleeping (40%). Physicians perceived low self-esteem (32%), anxiety (24%) and embarrassment (17%) as having the greatest impact on patients. There was disagreement among physicians about which discipline is best placed to treat MNE. Favored treatments were not necessarily consistent with evidence-based guidelines.

**DISCUSSION:**

The findings of these complementary surveys illustrate that the causes and best treatment of MNE are subject to misconceptions on the part of both the physician and the patient's caregiver. Overall, MNE is perceived as a psychological condition, rather than having a multifactorial pathophysiological basis with a substantial psychological impact. Educational initiatives for healthcare practitioners and the public should help to optimize the understanding of MNE and care of patients.

**8** 16:16**Morning Urinary Aquaporin 2 is a Useful Biomarker for Predicting Desmopressin Treatment Outcome in Enuresis with Nocturnal Polyuria.**

Yoshiyuki Ohtomo, Koji Sakuraya, Toshiaki Shimizu,

*Department of Pediatrics, Juntendo University Nerima Hospital, Nerima, Japan***BACKGROUND :**

Aquaporin 2 (AQP2) is an arginine vasopressin (AVP) sensitive water channel that mediates transmembrane water transport in the collecting ducts and several investigators have examined urinary AQP2 instead of plasma AVP in patients with nocturnal enuresis. We previously reported day-night ratio of urinary aquaporin 2 reflected enuresis severity. To investigate whether morning urinary aquaporin 2 could be used as an early biomarker of predict of desmopressin therapeutic effect in polyuria type nocturnal enuresis.

**METHODS:**

We measured urinary AQP2/creatinine (AQP2/Cr) in polyuria type nocturnal enuresis children treated with desmopressin acetate oral disintegrating tablet (dDAVP ODT).The morning urine AQP2 was measured before and within 8 weeks after desmopressin treatment. Patients were classified into an elevated AQP2/Cr group (elevated group) and a decreased AQP2/Cr group (decreased group) before and after desmopressin treatment.

**RESULTS:**

53 polyuria type nocturnal enuresis children (28 boys, 23 girls) were included in this study. Median age of starting desmopressin treatment was 8.2 years, and the median observation period was 1.3 years. Among the 47 children obtained more than six months observation period, 38 were classified into the elevated group and 9 were into the decreased group. There was no difference in the age at the start of desmopressin treatment and the observation period between the two groups. The number of patients who could finish enuresis treatment at the time of last follow-up were fifty (39.5%) in the elevated group and two (22.2%) in the decreased group. The rate of patients who could finish desmopressin treatment during observation periods in the elevated group was significantly higher than those of the decreased group (91.9% vs 44.4%;  $p < 0.01$ ).

**CONCLUSIONS:**

This study suggests that the morning AQP2/Cr is useful biomarker to predict response of desmopressin treatment in enuretic patients with nocturnal polyuria.

**9** 16:24**Homeflow: comfort of uroflowmetry at home with children – a feasibility study.**

Sebastiaan Horn, Karen De Baets, Alexandra Vermandel, Gunter De Win, Stefan De Wachter,

*Department of Urology, Antwerp University Hospital, Edegem, Belgium*

**INTRODUCTION AND OBJECTIVE :**

Paper based frequency volume charts (FVC) are an established method for evaluation of voiding disorders in children, including enuresis nocturna, but often not reliable because of incomplete registration by the patient or parent. A home-uroflowmetry - automatically registering voiding volume and time - connected to an online app to enter intake, urge and leakages can be an alternative. In this study we will assess the user feasibility and experience of the the Homeflow with children.

**PATIENTS AND METHODS:**

8 patients (mean 11,1 years, 4-18 years, M:6 F:2) were included to use the Homeflow at home for 2 consecutive days. Every void was collected in the Homeflow and every intake registered in the app. User-experience data (completeness, reliability, feasibility) was collected through daily questionnaires by the parents/child. Data was analyzed by percentage-based descriptive statistics.

**RESULTS:**

All patients(100%) reported their Homeflow FVC (voids, intake, leakages) to be complete. Most subjects considered their diary as representative(50%) or rather representative(37,5%) for a normal day/night. The experience with the app was rated as user-friendly(50%) or rather user-friendly(37,5%). Since the home-uroflowmeter fits on a normal toilet, most patients(87,5%) considered their voiding posture neutral with no refrain(87,5%). All 4 patients with pre-existing experience preferred the Homeflow over paper based FVC. 71,4% preferred the Homeflow over uroflowmetry in the hospital.

**CONCLUSION:**

The Homeflow was preferred by parents and children over paper based FVC and uroflowmetry in the hospital. Complete registration of voiding was achieved through automated measurements. Based on this user-experience data the Homeflow is considered to be a user-friendly, hygienic, comfortable method to evaluate voiding disorders at home.

**10** 16:32**Sleep quality and daytime activity in children with incontinence – an actigraphy study.**

Justine Hussong, Hannah Mattheus, Silvia Noori, Giuseppina Grillo, Alisha Rosenthal, Alexander von Gontard,

*Saarland University Hospital, Hamburg, Germany*

11 16:40

**INTRODUCTION:**

Sleep difficulties are common in children with nocturnal enuresis (NE). Actigraphy studies in children with NE found longer sleep latency and more nighttime awakenings. Daytime motor activity has not been studied so far in children with daytime urinary incontinence (DUI) or with NE. Therefore, the aim was to assess sleep quality and daytime activity in children with DUI and/or NE objectively and reliably.

**METHODS:**

Patients with NE or DUI, diagnosed according to ICCS guidelines, and a control group were asked to wear an actigraph watch for 4 days and nights. The watch measures sleep latency, sleep efficiency, nighttime awakenings and the intensity of daytime activity. Further, an IQ test was conducted and all children were screened for psychological symptoms by the CBCL, for psychiatric disorders by a parental interview. Preliminary data of 9 patients (mean age=8.5 years, 66.7% boys) and 5 controls (11.3 years, 40% boys) are presented.

**RESULTS:**

6 patients had monosymptomatic NE, 3 had additional DUI. 33.3% of patients had a clinical CBCL total score (vs. 0% in patients). First analyses showed no significant differences between patients and controls regarding mean sleep efficiency (88.5% vs. 89.2%), mean time of wake of sleep onset (WASO) (42.0 vs. 41.2 minutes), nighttime awakenings (17.2 vs. 16.4), mean awakening time (2.4 vs. 2.6 minutes) and sedentary daytime activity (40.3% vs. 44.3% per day). There is a statistical trend for increased mean daily steps in patients vs. controls (14,676 vs. 11,601,  $p=.076$ ). Internalizing symptoms were significantly associated with WASO and nighttime awakenings.

**CONCLUSION:**

First data showed no major differences in sleep parameters in this ongoing study. Daytime activity results indicate that patients are more active which could be possibly related to comorbid psychiatric disorders, e.g. ADHD. Internalizing symptoms (anxiety and depression) influence sleep quality and may be associated with urinary problems.

**Do children with nocturnal enuresis have a different quality of sleep on days when they urinate at night?**

Tsuneki Watanabe,

*Department of Pediatrics, Showa University Northern Yokohama Hospital, Yokohama, Japan*

**BACKGROUND:**

The relationship between nocturnal enuresis and sleep, including an increase in the arousal threshold, is deep. However, there are still many unclear points.

**MATERIAL AND METHOD:**

The subjects were 8 patients with nocturnal enuresis who were able to obtain consent to wearing a simple sleep electroencephalogram device that could be measured at home. The pediatric patient was lent a one-channel electroencephalography for one week. It was worn at home during sleep and collected later. The data of the day of night urination (NE +) and the day without night urination (NE -) in the record of 1 week were compared and examined.

**RESULT:**

The subjects were 4 boys and 4 girls, with a median age of 10 years (8 -11 years old). There was no significant difference in sleep time between the two groups. However, sleep efficiency was significantly lower on NE + days and non-REM sleep latency (Time from falling asleep to the first non-REM deep sleep, N3) was significantly longer on NE + days.

**CONCLUSION:**

Sleep in children with nocturnal enuresis may differ between NE + and NE-days. Furthermore, it was suggested that NE + day may decrease sleep efficiency and prolong non-REM deep sleep latency.

**12** 16:48**Examination of Posture, Balance and Quality of Life in Children with Monosymptomatic Nocturnal Enuresis.**Büşraİnal<sup>1</sup>, Nuriye Özenin<sup>1</sup>, Yeşim Bakar<sup>1</sup>, Handan Ankaralı<sup>2</sup>, Yusuf Öztürk<sup>3</sup>,

1. *Department of Physiotherapy and Rehabilitation, Abant İzzet Baysal University Faculty of Health Sciences, Bolu, Turkey*
2. *Department of Biostatistics and Medical Information, Abant İzzet Baysal University Faculty of Health Sciences, Bolu, Turkey*
3. *Department of Child and Adolescent Psychiatry, Abant İzzet Baysal University Faculty of Health Sciences, Bolu, Turkey*

**CONTENTS OF THE ABSTRACT:**

This study aimed to evaluate and compare spinal posture, balance and quality of life related urinary incontinence of children with primary monosymptomatic nocturnal enuresis and healthy children. Thirty-five children with primary monosymptomatic nocturnal enuresis and 34 healthy children were included in the study. After the physical and socio-demographic characteristics of the children were recorded, they were asked to fill out a 4-day bladder diary and a 7-day bowel diary.

With Continence Specific Pediatric Quality of Life Measurement Tool the quality of life, with Bladder and Bowel Dysfunction Questionnaire the symptom severity, with Spinal Mouse device the spinal posture, with Biodex Balance device the static and dynamic balance of the children were evaluated. It was found that there is increased lumbal lordosis ( $p=0,018$ ) and sacral-hip angles ( $p=0,029$ ), worse mediolateral dynamic balance ( $p=0,049$ ), decreased static balance ( $p=0,001$ ) while eyes closed on foam surface, negatively affected quality of life ( $p=0,001$ ) and symptom severity ( $p=0,001$ ) in children with primary monosymptomatic nocturnal enuresis in comparison with healthy children. The mean age of children with primer monosymptomatic nocturnal enuresis was 9 years, healthy children was 8,5 years and there was not different between groups ( $p>0,05$ ). There were 12 girls and 23 boys in the primer monosymptomatic nocturnal enuresis group and 13 girls and 21 boys in the healthy group. There was similar in girls and boys rate between in groups ( $p>0,05$ ).

As a result of this study, it was found that the children with primary monosymptomatic nocturnal enuresis in comparison with healthy children had worse posture, static and dynamic balance, and their quality of life and symptom severity were negatively affected.

**17:20–17:40 | BBD and COMORBIDITIES - STATE OF ART.**

Ann Wright

**SESSION 4: BBD AND COMORBIDITIES****1** 17:40**Behavioral comorbidity in children with incontinence  
– an analysis of 1641 cases.**

Alexander von Gontard, Hannah Mattheus, Katerina Anagnostakou, Heike Sambach, Michaela Weber, Kathrin Kiefer, Teresa Hollaender, Justine Hussong,

*Saarland University Hospital, Homburg, Germany*

**INTRODUCTION:**

Children with nocturnal enuresis (NE), daytime urinary incontinence (DUI) and fecal incontinence (FI) have increased rates of behavioral symptoms. The aim of this study was to analyze the specific behavioral comorbidity in subtypes of incontinence.

**METHODS:**

1641 consecutive patients presented to a tertiary outpatient clinic for incontinence from 2012 to 2018 were examined prospectively according to ICCS criteria. Behavioral symptoms were measured with the Child Behavior Checklist (CBCL) using the clinical cut-off (90th percentile).

**RESULTS:**

The mean age was 7.8 years, 67% of patients were male. 57% had NE (n=934), 33% DUI (n=547) and 40% FI (n=656). 39.2% (n=539) of all children had clinically relevant behavioral symptoms according to the CBCL total score with no difference between isolated NE (42.9%), DUI (+/-NE) (40.9%) and FI (41.7%). Children with monosymptomatic NE (37.2% in primary and 33.3% in secondary NE) were less affected than those with non-monosymptomatic NE (45.7% in primary and 48.3% in secondary NE). Among those with DUI, children with voiding postponement (46.0%) had behavioral symptoms more often than those with urge incontinence (37.3%), but the rates did not differ significantly. There was no difference between children with FI and constipation (57%) and those with non-retentive FI (59.4%).

**CONCLUSIONS:**

Children with all types of incontinence (NE, DUI and FI) carry a high risk for clinically relevant behavioral symptoms. Non-monosymptomatic NE (irrespective if primary or secondary) and DUI with voiding postponement have the highest risk, while FI -subtypes do not differ. Due to the high rates, all children with incontinence should be screened with broad-band behavioral questionnaires.

**2** 17:48**Incontinence and anxiety disorders in preschool children  
– a population-based study.**

Justine Hussong<sup>1</sup>, Marion Greiner<sup>2</sup>, Ulrike Schiedermaier<sup>2</sup>, Katerina Anagnostakou<sup>1</sup>, Hannah Mattheus<sup>1</sup>, Alexander von Gontard<sup>1</sup>,

*1. Saarland University Hospital, Homburg, Germany,*

*2. Institute for Community Health, Saarbruecken, Germany*

**INTRODUCTION:**

In preschool age, up to 20% are affected by anxiety disorders, especially separation anxiety disorder (SAD), specific phobia (PHOB), social phobia (SOC) and generalized anxiety disorder (GAD). The co-occurrence between anxiety disorders and incontinence in preschool children is high. The aim of the study was to examine associations of specific anxiety disorders, depressive symptoms and incontinence in a representative, population-based sample of preschool children.

**METHODS:**

All preschool children of a defined geographical area examined before school-entry were included. Parents were asked to complete a questionnaire including the preschool feelings checklist (PFC), 8 questions referring to nocturnal enuresis (NE),

daytime urinary incontinence (DUI), fecal incontinence (FI) and constipation, and 30 items regarding DSM-5 diagnostic criteria of SAD, PHOB, SOC and GAD. Preliminary data of 862 children (mean age=5.6 years; 53.9% males) are presented.

### RESULTS:

Rates of incontinence overall were 14.6% (12.7% NE, 3.2% DUI, 1.3% FI) and 5.5% for constipation. 31.7% had an anxiety disorder, 13.5% had clinically relevant depressive symptoms (measured by the PFC). Rates of SOC were increased in NE (23.1%), DUI (40%) and constipation (27.3%) compared to continent children (13.2%). PHOB was more common in FI (55.6%) and constipation (30.3%) compared to continent children (16.4%). There were no associations between SAD/GAD and incontinence. Compared to continent children (10%), depressive symptoms were more frequent in children with DUI (48.1%), FI (72.2%), NE (26.7%), constipation (37%) and anxiety disorders (29.1%).

### CONCLUSIONS:

Anxiety disorders and depressive symptoms are very common in children with incontinence. The most specific DSM-5 disorders are SOC and PHOB, which can be incapacitating and may require treatment. Due to the high rates, it is important to screen all children with incontinence in all settings e.g. with specific questionnaires.

## 3 17:56

### Uroflowmetry parameters after complete response of lower urinary tract symptoms in children with or without comorbid behavioral disorders.

Kazuyoshi Johnin<sup>1</sup>, Chihiro Sawai<sup>2</sup>, Yuri Mori<sup>1</sup>, Shota Nakagawa<sup>1</sup>, Kenichi Kobayashi<sup>1</sup>, Akihiro Kawauchi<sup>1</sup>,

1. Department of Urology, Shiga University of Medical Science,

2. Department of Pediatrics, Shiga University of Medical Science

### INTRODUCTION:

In clinical practice, children with comorbid behavioural disorders (CBD), such as intellectual impairment (II), attention-deficit/hyperactivity disorder (ADHD) or autism spectrum disorder (ASD), are more difficult to treat. It is unclear how the parameters

of uroflowmetry will change after complete response of LUTS with or without CBD. Here we compared the data before and after treatment in both cohorts.

### MATERIALS AND METHODS:

One hundred and seven children (77 boys and 30 girls: aged 6-18 years old) were enrolled to this study, who were confirmed complete response of LUTS: monosymptomatic nocturnal enuresis (MNE) (37), non-MNE (NMNE) (33), Daytime urinary incontinence and or dysfunctional voiding (DUI/DV) (37). We compared before and after data from children with or without CBD: treatment duration and modality, Dysfunctional Voiding Symptom Score (DVSS), maximal voided volume (MVV)/ estimated bladder capacity (EBC), and uroflowmetry parameters [Qmax, Qave, bladder capacity (BC)/EBC, Flow Index].

### RESULTS:

Eighty-two children without CBD and 25 children with CBD met the study criteria. Children with CBD included II in 10, ADHD in 10 and ASD in 10. Mean treatment duration showed 24±20 and 20±14 months in children with or without CBD, respectively. While 28% of children with CBD were treated by urotherapy alone, 34% of children without comorbidity were treated by alarm alone. After treatment DVSS significantly decreased in both cohorts. MVV/ EBC significantly increased after treatment in all children without CBD and NMNE children with CBD. The results of uroflowmetry were as follows: BC/EBC did not change in both cohorts. Qmax significantly increased in MNE and DUI/DV children without CBD and DUI/DV children with CBD. FI significantly increased in MNE children without CBD.

### CONCLUSIONS:

Children with CBD did not need longer treatment period than children without CBD. FI did not change in all children with CBD, but in MNE children without CBD.

**4 18:04****Prospective Stress Evaluation and Critical Life Events in Children with Incontinence.**

Hannah Mattheus, Justine Hussong, Catharina Wagner, Eva Ramp, Julie Szabo, Alexander von Gontard,

*Department of Child and Adolescent Psychiatry, Saarland University Hospital, Homburg, Germany*

**INTRODUCTION:**

Children with incontinence have higher rates of psychiatric comorbidities and behavioral problems, whereas their parents exhibit higher levels of parental stress. In addition, children with incontinence experience more critical life events or show a different sensitivity towards stressful experiences and differ in their coping mechanisms. Experiencing a stressful event e.g. parent's divorce increases the risk of being affected by enuresis. However, the association between children's stress-experience with incontinence, the number of stressful life events and parental stress has not been systematically examined so far.

**METHODS:**

To assess stress and positive/negative life events, parents and children separately completed self-assessment questionnaires (ESF/SSKJ/CASE/CBCL). Children also prospectively completed a seven-day-diary with questions on their daily stress level and experience and if they had an incontinence accident. Data of 40 children with incontinence (15 had NE, 9 had DUI and 17 had FI; 20 male, mean age=8.9 years), 40 matched typically developed children (15 male, mean age=10.7 years) as well as their parents were compared.

**RESULTS:**

Children with incontinence had significantly more internalizing and externalizing symptoms ( $p < .001$ ) and showed a higher stress vulnerability ( $p = .007$ ). Children with incontinence and their parents reported a significantly higher number of negative life events ( $p < .001$ ) which were experienced with a significantly higher impact ( $p < .001$ ). There was no difference in children's daily stress experience by an incontinence accident. Parents of children with incontinence reported significantly higher levels of parental stress ( $p < .001$ ).

**DISCUSSION:**

Children with incontinence experience higher levels of stress and psychological symptoms and experience more negative life events with a higher impact. Therefore, incontinence in children might represent an important risk factor for an unfavorable cognitive processing of negative experiences, which leads to further stress. It is important to assess past stressful life-events, as well as current stress levels on a day to day basis in children with incontinence.

**5 18:12****The effectiveness of urotherapy in incontinent children with cerebral palsy.**

Bieke Samijn<sup>1</sup>, Christine Van den Broeck<sup>2</sup>, Vandamme Ellen<sup>3</sup>, Frank Plasschaert<sup>1</sup>, Ellen Deschepper<sup>2</sup>, Piet Hoebeke<sup>3</sup>, Erik Van Laecke<sup>3</sup>,

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*3. Department of Urology, Ghent University Hospital, Ghent, Belgium*

**INTRODUCTION:**

Urinary incontinence is the most frequently observed lower urinary tract symptom in children with cerebral palsy (CP). The objective of the study was to investigate the effectiveness of urotherapy in children with CP. Being continent can positively influence quality of life and health status of the child.

**PATIENTS AND METHODS:**

A prospective case-control study including 21 urinary incontinent children with cerebral palsy and 24 typically developing children with urinary incontinence was conducted between 2014 and 2018. Children received treatment for one year with three-monthly examination. Treatment was individualized to every patient. Children started with three months of standard urotherapy. Every three months treatment was adapted to primary problems and pharmacotherapy and/or specific interventions could be added to the initial treatment strategy. Time-effects were analyzed by means of multilevel modeling.

**RESULTS:**

Seven children with CP became dry during the day and 5 children became dry during the night. Significant time-effects ( $p < 0.05$ ) in children with CP were found with a higher voided volume, lower frequency of daytime incontinence, lower amount of urine loss, lower frequency of enuresis, less lower urinary tract symptoms, better micturition pattern and less fecal incontinence after training. In general, results demonstrate effectivity rate of urotherapy is lower and changes occur slower in time in children with CP compared to typically developing children.

**CONCLUSION:**

Urotherapy can be an effective long-term treatment for urinary incontinence in children with CP. Therapy should be multidisciplinary, individually adapted to child and feasible for the child and social environment.

**6 18:20**

### **Urinary Incontinence in The Obese Population: Characteristics and Therapy-Outcome.**

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1. *Department of Paediatric Nephrology, Ghent University Hospital, Ghent, Belgium,*

2. *Rehabilitation Centre, Zeepreventorium, De Haan, Belgium*

**INTRODUCTION:**

Obese children with urinary incontinence are more likely to be resistant to therapy. The objective of the study was to evaluate the characteristics of LUTS in obese children.

**METHODS:**

All patients admitted to Centre for morbidly obese children between September 2015 and August 2018 were evaluated. Only the obese children with symptoms of urinary incontinence were included. They answered a standard inquiry to evaluate their eating and drinking habits, voiding frequency, lower urinary tract symptoms (LUTS), severity of symptoms and stool pattern. All children started standard urotherapy and a strict drinking and micturition schedule. The success-rate was evaluated three months after achieving continence or at the end of the obesity program.

**RESULTS:**

Fifty-nine (13.5%) children (mean 13 yr, range 7-19 yr ) were diagnosed with urinary incontinence. At admission all patients were morbidly obese with a BMI z-score  $\geq 2$ . The majority of the patients had a decreased fluid intake (66.1%), a decreased (40,7%) or normal voiding frequency (42.4%). Half (50%) of the patients had urgency symptoms. During uroflowmetry MVV was normal in 81.4%. Ten patients (16.9%) had a large and only 1 patient (1.7%) had a decreased maximum voided volume. Remarkable thirty-five (59.3%) patients had an overdistended bladder ( $>115\%$  EBC). Seventeen patients (28%) were excluded. All other patients started with urotherapy, followed by a strict drinking and micturition schedule. Eleven (28.2%) patients needed additional biofeedback training. All these patients achieved complete continence.

**CONCLUSION:**

Morbidly obese children are more prone to urinary incontinence compared to the general paediatric population with a prevalence of 13.5 %. Obese children suffer more from an overdistended bladder caused by holding manoeuvres with secondary urgency. Obese children are not therapy resistant, but are more likely to present a compliance problem which can influence the success rate of therapy.

**7 18:28**

### **Incontinence, comorbid mental disorders and parental distress in children and adolescents with ADHD.**

Kathrin Kiefer, Hussong Justine, Mattheus Hannah, Holländer Teresa, Baumann Clara, Wasmayr Sophie, von Gontard Alexander,

*Saarland University Hospital, Department of Child and Adolescent Psychiatry, Homburg, Germany*

**INTRODUCTION:**

Attention-deficit/hyperactivity disorder (ADHD) and incontinence are associated, but few studies assessed clinical findings based on objective methods. Also most studies have focused on comorbid ADHD in children with incontinence. The aim of the study was to assess incontinence and associated urological and psychological data in children with ADHD and a typically developed control group.

**METHODS:**

23 children with ADHD (69.6% male, mean age 9.7 years) and 28 healthy controls (32.1% male, mean age 9.1 years) received full incontinence and psychiatric examinations, intelligence test, uroflowmetry and ultrasound of bladder and rectum. Parents underwent a structured diagnostic interview regarding psychiatric diagnoses and completed questionnaires on psychological symptoms (CBCL) and ADHD symptoms. A 48h bladder diary was completed at home. Nocturnal enuresis (NE) (NE), daytime urinary incontinence (DUI) and fecal incontinence (FI) were diagnosed according to Rome-IV and ICCS criteria.

**RESULTS:**

21.1% of the ADHD group had incontinence vs. 3.8% of the controls. 2 children with ADHD had a secondary monosymptomatic EN, 2 had DUI. One control was diagnosed with non-retentive FI. Children with ADHD had significantly more internalizing and externalizing symptoms ( $p < .001$ ). Preliminary results show no significant difference between the groups regarding voiding frequency, uroflowmetry data and ultrasound parameters. First results show that children with incontinence had a lower micturition volume than continent children.

**CONCLUSION:**

First data of this ongoing study show that children with ADHD have higher rates of psychological symptoms and incontinence, but similar somatic findings. Therefore, it is recommended to screen all children with ADHD for incontinence.

8 18:36

### What can a 4-hour micturition observation in newborns with spinal dysraphism tell?

Peter Wide, Gunilla Glad Mattsson, Sven Mattsson,

*Division of Pediatrics, Department of Clinical and Experimental Medicine, Linköping University, Linköping, Sweden*

**INTRODUCTION:**

4-hour micturition observation (MO) is an easily performed non-invasive method for the evaluation of bladder function in newborns. Neonatal bladder function evaluated with MO has been described for healthy neonates but not for children with spinal dysraphism (SD), for whom early bladder evaluation is essential.

**METHODS:**

A micturition observation with leakage provocation was performed consecutively in children <6 weeks of age evaluated for possible neurogenic bladder dysfunction due to SD, mainly myelomeningocele. Mean age was 9.6 days. MO was performed during 4 hours with visual observation the last hour registering behavior and urinary flow. Finally, bladder provocations were performed and any leakage was noted. Findings were compared to those of healthy newborns (HN) earlier published.

**RESULTS:**

Some children had frequent small voided volumes and low maximum bladder filling while other had no voidings and high maximum filling. The group with SD voided 0-14 times (md 5) compared to HN 2-7 times (md 4), mean voided volume was 10 ml (range 0-39 ml) and 23 (1-77) respectively. Median residual urine in the SD group was 12ml (range 0-61). In the SD group 12/50 voided with a stream compared to all 49/49 in the HN ( $p < 0.001$ ). Of children with SD, 32(65%) had leakage at provocation test compared to none (0%) of healthy newborns ( $p < 0.001$ ).

**DISCUSSION:**

MO with provocation test of children with SD reveals significant differences compared to HN. Leakage during bladder provocation test was strongly associated with SD and should be regarded an evidence for neurogenic bladder sphincter dysfunction. Finding children needing CIC is important as well as being able to postpone or refrain from invasive urodynamics if not strongly indicated and MO with provocation test is a valuable method for these judgements.

**9:00–9:20 | LUTS – STANDARD UROTHERAPY – STATE OF THE ART.**Anke Nieuwhof-Leppink, *Utrecht University, the Netherlands***SESSION 5: LUTS – THERAPEUTIC APPROACH****1** 9:20**fMRI Connectivity Analysis Provides Evidence of CNS Mode of Action for Parasacral Transcutaneous Neural Stimulation - A Pilot Study.**Jose Murillo Netto<sup>1,2</sup>, Dustin Scheinost<sup>2</sup>, John Onofrey<sup>2</sup>, Israel Franco<sup>2</sup>1. *Universidade Federal de Juiz de Fora,*2. *Yale University***INTRODUCTION:**

Parasacral transcutaneous electrical nerve stimulation (pTENS) is a common treatment modality for patients with overactive bladder (OAB). Its mechanism of effectiveness has yet to be elucidated. Recent work with fMRI in adults with implanted sacral nerve stimulators impute its effectiveness on changes in the brain involving the frontal areas. Our aim was to evaluate MRI functional connectivity analysis to define where in the brain pTENS produces its effects.

**METHODS:**

10 adult volunteers without urinary tract symptoms as assessed by OABSS underwent fMRI. Electrodes were placed on skin at sacral level (S2) (pTENS) and on the right scapular region (Sham Stimulation - sTENS). Stimulation was done in each site for 6 minutes at a frequency of 10 Hz and pulse width of 260  $\mu$ s and intensity determined by the motor threshold. A 6 minutes resting state fMRI was also done as control. Functional connectivity data was acquired during each state (resting, pTENS and sTENS). Standard functional connectivity preprocessing was performed. Seed connectivity was examined to investigate changes in ACC functional connectivity between the stimulations and resting-state conditions. Significance was assessed at  $p < 0.05$  corrected for multiple comparisons.

**RESULTS:**

For all conditions (pTENS, sTENS, and rest), standard patterns of ACC connectivity were detectable with strong connectivity between the ACC and subcortical regions

and between the ACC and the frontal lobe. Functional connectivity between ACC seed and the dorsal lateral prefrontal cortex (DLPFC) was significantly increased during pTENS compared to rest. sTENS did not increase connectivity between the ACC seed and DLPFC when compared to rest.

**CONCLUSIONS:**

Preliminary results indicate that ACC is a major site of activation during pTENS. Increased connectivity between ACC and DLPFC may be a possible mechanism of pTENS effectiveness, which appears to be specific to pTENS compared to sTENS.

**2** 9:28**Evaluation of a multidisciplinary tertiary urinary continence service.**Patrina Caldwell<sup>1</sup>, Lynne Brodie<sup>2</sup>, Violeta Sutherland<sup>2</sup>,1. *The Children's Hospital at Westmead and University of Sydney,*2. *Agency for Clinical Innovations***BACKGROUND AND AIMS:**

Resources to meet the needs of children and adolescents with urinary incontinence are limited. This project evaluates data from a multidisciplinary continence service at an Australian tertiary paediatric hospital.

**METHODS:**

Using standard statistical methods, we describe activities and patient demographics of the service, compare needs of adolescent and younger patients and report on the comparative effectiveness of an online self-help program for patients on the waiting list.

**RESULTS:**

650 patients were on the continence service waiting list between 2014-2016. The average waiting time was 339 days. Patients' age ranged from 5-15 years (average 9 years), and 56% were male. At 12 months follow-up after the first appointment, 23% were dry, 36% had improved and 41% reported no change.

15% of patients seen were of transition age (15 years and above). When compared with those below the transition age, adolescents were older at initial presentation (15 versus 8 years,  $p < 0.0001$ ) and had higher rates of developmental delay (17% versus 9%,  $p < 0.05$ ) or chronic illness (23% vs 9%,  $p = 0.003$ ). 44% of adolescents had a dry outcome compared with 33% of younger children, but required more clinic visits (6 versus 4).

157 patients were offered an online self-help program while awaiting their first appointment. Comparing the effect of the online program alone with patients seen in the clinic alone, 5% more patients were dry or improved in the clinic alone group. However, comparing those who used the online program and also attended the clinic with those who attended the clinic alone, more in the combined treatment group were dry or improved, with a reduction in clinic attendance.

#### CONCLUSION:

Addressing needs of adolescents and use of an online self-help program may improve treatment outcomes for children and young people with urinary incontinence in the future.

3 9:36

### Assessment and treatment of children with daytime urinary incontinence.

Marleen Linde<sup>1</sup>, Dineke R. Ypma<sup>1</sup>, Ilse Hofmeester<sup>1</sup>, Martijn G. Steffens<sup>1</sup>, Francis J. Kloosterman<sup>2</sup>, Marco H. Blanker<sup>3</sup>,

1. Department of Urology, Isala, Zwolle, the Netherlands,

2. Department of Pediatrics, Isala, Zwolle, the Netherlands,

3. Department of General Practice and Elderly Medicine,

University Medical Center Groningen, University of Groningen, the Netherlands

#### INTRODUCTION:

Urinary incontinence (UI) is one of the most common paediatric urological complaints, treated by both paediatricians and (paediatric) urologists. The diagnostic and therapeutic approach of daytime UI seems to differ between

specialties, despite a shared clinical practice guideline. The aim of this study is to compare the assessment and treatment between these medical specialties.

#### METHODS:

We performed a retrospective database study of children who were referred to our hospital in 2016 or 2017 for daytime UI. We used Diagnosis Treatment Combination (DBC) codes for UI, dysfunctional voiding, urinary tract infections, constipation and related conditions to select the patients. We manually checked all selected medical files. Children suffering solely from nocturnal enuresis were excluded, as well as children with a urinary tract infection as only cause for the UI. We compared the diagnostic and therapeutic steps of the (paediatric) urologist and paediatrician. Children who were mutually referred were excluded in this analysis.

#### RESULTS:

We included 312 children primarily referred to a paediatrician (254) or a urologist (58). Fifty-two percent were boys. Most children experienced UI more than four times a week (60.9%) and 70.2% had concomitant nocturnal enuresis. The paediatricians treated more often with urotherapy (97.2% vs. 75.0%,  $p < 0.001$ ) and laxatives (35.5% vs. 19.6%,  $p = 0.025$ ). Children referred to the urologist were older (median 9 [6-12] vs. 6 [5-8] year,  $p < 0.001$ ). The urologists used (invasive) diagnostics more often, prescribed more medication (76.8% vs. 19.9%,  $p < 0.001$ ) and referred 2 children to the paediatrician. Paediatricians referred 38 children to the paediatric urologist.

#### CONCLUSION:

This study showed striking differences in the diagnostic and therapeutic approach of children with daytime UI by paediatricians and paediatric urologist although working in the same hospital.

**4 9:44****Parents' experiences with the outpatient care for daytime urinary incontinence in children.**

Marleen Linde<sup>1</sup>, Gertine Kroes-van Hattem<sup>2</sup>, Janita Hogenkamp<sup>2</sup>, Ilse Hofmeester<sup>1</sup>, Rien J.M. Nijman<sup>3</sup>, Martijn. G. Steffens<sup>1</sup>, Francis J. Kloosterman-Eijgenraam<sup>2</sup>, Marco H. Blanker<sup>4</sup>,

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4. *Department of General Practice and Elderly Medicine,*

*University Medical Center Groningen, University of Groningen, the Netherlands*

**INTRODUCTION:**

Urinary incontinence (UI) is a common problem in children with a considerable effect on the quality of life and self-esteem. Many children are treated on outpatient clinics, but little is known about the parental experiences with the care for their children with UI. We aimed to explore the experiences of parents whose child was treated in our hospital for daytime UI. Study design We performed a qualitative study through semi-structured interviews with parents of children aged 4 to 12 years treated for daytime UI with or without nocturnal enuresis. The interviews took place after the last visit to the hospital, face-to-face or by telephone, were tape-recorded, transcribed verbatim, and analysed with ATLAS.ti 8.3.1 based on Grounded Theory.

**RESULTS:**

After seven interviews saturation was achieved. Three domains were identified that affect the care experience: social context, interaction between professional and parent-child and diagnostics/treatment. The domains consist of sub-themes that are interconnected. Motivating interviewing techniques and levelling with the child contributed to a positive experience. Most parents mentioned that they had a say in diagnostic or therapeutic decisions and that the care was child-centred. Repeating and prolonged continuation of treatment steps have a negative influence on the care experience. Some parents mentioned that their expectations were not always discussed at the start. The diagnostic tests were not bothersome according to most of the children. However, having to take medication and certain parts of the urotherapy were reported as bothersome.

**CONCLUSION:**

This qualitative study is the first to explore parents' experiences. Different aspects together form and influence the care experience. It is important to pay attention to both the parent and child and to take expectations into account. Treatment steps should be critically assessed and not needlessly be repeated. Further research will be performed to quantify these outcomes.

**5 9:52****Toilet training children with special needs using a Potty Monkey toy device.**

Natasha Bartos<sup>1</sup>, Sana Hamilton<sup>2</sup>, Liz Barnes<sup>3</sup>, Patrina Caldwell<sup>4</sup>,

1. *The Children's Hospital at Westmead,*

2. *Centre for Kidney Research, Children's Hospital at Westmead,*

3. *NHMRC Clinical Trials Centre, University of Sydney,*

4. *The Children's Hospital at Westmead and Discipline of Child and Adolescent Health, University of Sydney*

**BACKGROUND AND AIMS:**

Toilet training children with special needs can be challenging and can result in long-term consequences if inadequately addressed. This study evaluates the use of a "Potty Monkey" toy for toilet training children with special needs who were not yet toilet trained.

**METHODS:**

A pilot study of using a "Potty Monkey" to model timed voiding in special needs children aged 4-10 years. Using logistic regression we compared patient factors impacting treatment outcome. We collected parental feedback and examined the experience of families using a "Potty Monkey" to toilet train their child.

**RESULTS:**

Of 21 children in our study, 15 were male. Age ranged 4-10 years (median 6 years). Time that "Potty Monkey" was used ranged from 0-156days (mean 46.6days; median 22days). At 6 month follow up, 9 children improved, 5 were unchanged, 4 were worse

and 3 were 'status unknown'. We found no statistically significant difference for patient factors that impacted treatment outcome when examining for different ages, gender, time using "Potty Monkey" and by baseline toilet training ability. The experience of families was ambivalent. 10 families reported "Potty Monkey" had been helpful however many complained it interfered with family schedules. Reasons for child not responding positively to the "Potty Monkey" were due to sensory issues, embarrassment and not being developmentally ready. Our study demonstrated the practical challenges of conducting research among children with special needs. Difficulties with recruitment, adherence to treatment and data collection likely stemmed from a number of factors including clinicians being too busy to refer patients and parents too preoccupied with other health and life concerns to focus on toilet training.

#### CONCLUSION:

Future studies that focus on toilet training children with special need to reduce the burden of participation for families and adopt a strategy that is flexible and engaging.

## 6 10:00

### Lower Urinary Tract Dysfunction in pre-toilet trained children.

Rejane Bernardes, Carla Caldeira, Mariestela Garcia,

*Clinica Nefrokids-Curitiba/Brazil*

#### OBJECTIVE:

To report the findings on functional and imaging tests of the urinary tract in pre-toilet trained children diagnosed with lower urinary tract dysfunction(LUTD). The association of UTI, vesicoureteral reflux(VUR) and LUTD has been described in older children but has not adequately studied in infants.

#### METHODS:

Children under 36 months with LUTD performed ultrasonography (US); four-hour voiding observation (4-H): functional bladder capacity (FBC) as the highest value of bladder capacity(voided volume (VV) + post voiding residual urine(PVR)), expressed as percent of expected bladder capacity(EBC) and the voiding efficiency (VE)  $(VV/(VV+PVR)*100\%)$ . Urodynamics(UD) and voiding cystourethrography (VCUG) were

performed simultaneously - cystometric capacity(CC)(percent of EBC). Classification of LUTD: detrusor overactivity(DO), detrusor hypoactivity(DH) and voiding dysfunction(VD).

#### RESULTS:

111 children aged  $9.4\pm 7.6$  months, 60 females and 51 males had  $2,0\pm 1,3$  episodes of UTI, 66% had mild/moderate renal pelvis dilation. 4-H showed: voiding frequency  $4.8\pm 2.4$ , mean FBC  $110\pm 47\%$  (15%150%), mean VE  $78\pm 15\%$  (51%5ml. UD showed CC  $149\pm 58\%$ , compliance  $7\pm 6\text{ml/cmH}_2\text{O}$  and DO in 17%. VCUG demonstrated a spinning top urethra(STU) in 10%, VUR in 28 patients (25%), 46% bilateral and 54% unilateral. Among 41 ureters with VUR, 44% grade I-II, 42% grade III-IV and 14% grade V. 34% had renal scars on DMSA. 34 patients(31%) had mild hypertension, 26(23%) constipation. 69 patients(62%) diagnosed as VD, 33(30%) as VD+DO, 2(2%) as DH and 7(6%) as DO.

#### CONCLUSION:

Functional evaluation of the urinary tract in pre-toilet training children is challenging since we don't have any information by anamnesis regarding voiding habits. The old belief that urinary problems appear or resolve spontaneously in the removal of diapers is no longer accepted. A functional assessment has become essential in infants with UTI and VUR because changes in bladder dynamics affect the upper urinary tract with an increased risk of renal scarring, hypertension, and chronic kidney disease when extensive and bilateral damage.

## 7 10:08

### Urinary Incontinence associated with laughing: is it true giggle incontinence?

SoeThit San<sup>1</sup>, Elizabeth Barnes<sup>2</sup>, Dr Patrina Caldwell<sup>1</sup>,

1. Sydney Children's Hospital Network,

2. Kids Research Institute, The Children's Hospital at Westmead

#### INTRODUCTION:

International Children's Continence Society (ICCS) defines giggle incontinence as extensive voiding during or immediately after laughing in someone with normal bladder

function in the absence of laughter. The prevalence of true giggle incontinence is unknown as some studies about giggle incontinence report association with lower urinary tract symptoms and/or variable volumes of urinary leakage with laughing, raising the questions about the definition and diagnosis of giggle incontinence in children who present with urinary incontinence associated with laughing. This study aims to improve our understanding of giggle incontinence by examining the characteristics of children with daytime urinary incontinence, comparing those who have urinary incontinence associated with laughing with those with daytime urinary incontinence at other times.

#### **METHOD:**

Data from patients who presented to an Australian tertiary pediatric incontinence clinic during 2017 –2018 was reviewed. Differences between those who presented with the primary symptom of urinary incontinence with laughter and those with daytime urinary incontinence at other times including during laughter were compared with those with daytime urinary incontinence not associated with laughter using standard statistical method. Main Findings Of 265 new patients seen, 135(50%) had daytime urinary incontinence, and of these, 72 (53%) had incontinence associated with laughing. 5 (6.9%) of the 72 patients presented with the primary symptom of incontinence with laughter, but only 1 patient met the ICCS criteria of giggle incontinence. At the second visit, urinary incontinence had either improved or resolved in 68%, using either standard urotherapy alone or in combination with anticholinergics.

#### **CONCLUSION:**

Although half of those patients who presented with daytime urinary incontinence had incontinence associated with laughing, most do not fulfill the ICCS criteria of giggle incontinence.

### **Diagnosis of paradoxical movement of the pelvic floor muscles in children with voiding dysfunction.**

Ludmila Menovshchikova<sup>1</sup>, Guseva Natalia<sup>1</sup>, Sottaeva Zuleykha<sup>1</sup>, Risalat Dzhavatkhanova<sup>2</sup>,

1. *Russian State Medical University, Moscow, Russia,*

2. *Filatov Childrens Hospital, Moscow, Russia*

#### **PURPOSE:**

To estimate the informative content of transperineal ultrasonography as a method of diagnosis of paradoxical movement of the pelvic floor muscles in children with voiding dysfunction (VD).

#### **MATERIAL AND METHODS:**

Were examined 80 children with voiding dysfunction: 48 girls (60%) and 32 boys (40%). All children complained on difficulty during the voiding. A comparison group was 60 children (36 girls, 24 boys) without such complains The mean age was  $8.8\pm 3.2$  years. The pelvic floor muscles (PFM) was assessed using transperineal ultrasonography. During the study, the position of the patient was on the left side with the lower extremities brought to the abdomen. Ultrasonic sensor was installed on the child's crotch. Two types of sensors were used: linear (8,0–12,0 MHz) and convex (3,5–5,0 MHz). A mandatory component was the filling of the bladder (MP) before the first urge to urinate. Were measured following parameter: the value of the posterior urethro-vesical angle (PUVA), the length of the urethra in girls and the prostatic part of the urethra in boys at rest and in a urine retention test.

#### **RESULTS:**

In the comparison group PUVA in rest was  $103\pm 7^\circ$  both In girls and boys. In urine retention test the angle reduced by  $12\pm 3^\circ$ , urethra extended by  $3\pm 1$  mm and bladder neck deviated to pubic. In patients with VD PUVA in rest was increased up to  $135^\circ$ , regardless of gender or age. In urine retention test the angle increased up to  $142\pm 5^\circ$ , the bladder neck was deflected to the sacrum, the urethra shortened (paradoxical movement of the PFM).

**CONCLUSION:**

The transperineal ultrasonography can help to diagnose the paradoxical movement of the PFM. Method is simple, non-invasive, and can be recommended as a modern method of diagnosis of the pelvic floor dysfunctions and can help for detection patients for Biofeedback therapy.

**9** 10:24

### **A Pivotal Study to Assess the Performance and Safety of a New 5 French Air-Charged Catheter for Performing Urodynamic Studies on Pediatric Patients.**

Osama AL-Omar, Nora G. Kern, Sean T. Corbett, Susan V. Leroy, Amy Wildasin, Mikel Gray,

*Department of Urology, University of Virginia, US*

**BACKGROUND:**

To assess the performance and safety of the new T-DOC® air-charged 5Fr urodynamic bladder/abdominal catheters in pediatric patients and obtain feedback from providers related to user feasibility.

**METHODS:**

Patients ages 12 years and younger were prospectively recruited from 2 institutions who were undergoing urodynamics. Exclusion criteria were patients with bladder infections, urethral strictures, and suprapubic catheters. T-DOC® 5Fr catheters were connected, tested for competency and inserted, and standard urodynamics was performed. Issues with catheter placement, unexplained artifact, and adverse effects (AEs) were assessed. Providers completed a "Clinical User Questionnaire (CUQ)" to subjectively assess catheters. Likert scale was used (1=difficult, 3=equal to existing catheters, 5=much easier). Data are reported in mean (range). A follow-up telephone call was made 5–7 days after study to assess for any AEs. Results: 28 patients were enrolled. Mean age was 55 months (5-130) with 10 females and 18 males. 50% were spina bifida patients, while the remaining diagnoses included tethered cord, dysfunctional voiding, caudal regression, and posterior urethral valve. One problem was noted with insertion of abdominal catheter, secondary to stool impaction.

Catheters stayed in place on all subjects, except for 1 related to patient hyperactivity. There were no unexplained artifacts; no AEs occurred during the studies. On follow-up call, 4 reported AEs, 1 with hematochezia and 3 with dysuria. 5 providers completed CUQ and rated the T-DOC® 5Fr catheters with a mean of 4.1 (3-5) for overall ease of use. Ease of insertion was 3.9 (2-5) and set-up/clean-up time was 4.4 (3-5). Tracing stability, subtraction accuracy, and artifact sensitivity were all perceived as favorable (respectively 4.8, 4.6, and 4.4 (4-5)).

**CONCLUSION:**

The T-DOC® 5Fr catheter is safe and effective for use in pediatric patients. The catheter was perceived to be easier to use compared to existing catheters with more tracing stability and less artifact.

11:00–11:30 | **Cooperation lecture with ESPU** – Magdalena Fossum

11:30–11:50 | **LUTS – ADDITIONAL UROTHERAPY – STATE OF THE ART** – Ann Raes

## SESSION 6

1 11:50

### **The comparison of efficacy TENS therapy and pharmacotherapy (cholinolitics) in treatment of overactive bladder in children.**

Agata Lakomy-Gawryszewska<sup>1</sup>, Katarzyna Jozefowicz<sup>2</sup>,  
Ilona Chudzik<sup>1</sup>, Michal Maternik<sup>1</sup>, Aleksandra Zurowska<sup>1</sup>,

1. *Department of Pediatrics, Nephrology and Hypertension Medical University of Gdansk, Poland,*

2. *Department of Physical Therapy, Medical University of Gdansk, Poland*

#### **INTRODUCTION:**

Overactive bladder (OAB) is a relatively common cause of bladder dysfunction in children. Patients with OAB should undergo initial standard urotherapy followed by pharmacotherapy (cholinolitics) or TENS (Transcutaneous Electrical Nerve Stimulation) or a combination of both. TENS has been shown to be a valuable therapeutic method, however, little is known about its comparative effectiveness with pharmacotherapy.

#### **AIM OF THE STUDY:**

The aim of the present study was to investigate the comparative effectiveness of 4-month TENS therapy and cholinolitics in children with OAB.

#### **MATERIAL AND METHODS:**

87 children aged 6-18 years old with OAB were enrolled in the study following 4-weeks of standard urotherapy. Inclusion criteria were typical symptoms of OAB including urgency, frequent voiding, holding maneuvers and day-time incontinence. Children with urogenital malformations, constipation, increased bladder capacity >150% EBC and uroflow curve other than tower or bell-shaped were excluded. Patients were divided into two groups: a group which received initial TENS therapy (57) and a group treated with oxybutynin (30). Duration of therapy was planned for 4 months. TENS treatment was performed at home, twice a day (1 hour in the morning and 1 hour in the evening) with a uniform device using a frequency of 2Hz. Oxybutynin treatment

was performed with standard dosage. Treatment results were evaluated according to bladder diary, frequency/volume chart and uroflowmetry before and after treatment.

#### **RESULTS:**

The number of children with daytime incontinence significantly decreased in both groups: from 43 to 11 in TENS group and from 25 to 5 in the oxybutynin group. Subjects from both groups reported a significant decrease in the number of wet-days (from 6.5 to 1/14 days in TENS group and from 12 to 2/14 days in oxybutynin group) and days with urgency episodes (from 6.5 to 2/14 days in TENS group and from 9 to 4/14 days in oxybutynin group). The number of children with initial tower-shaped uroflow curve remained unchanged in both groups. 7% of patients in TENS group and 33% in the cholinolitics group reported lower urinary tract infections during the duration of treatment. The number of subjects with constipation declined significantly in the TENS treated group from 19 to 6 patients and remained unchanged in the oxybutynin group – 12 to 11.

#### **CONCLUSION:**

Both TENS and cholinolitic treatment are effective therapeutic options for children with OAB. Though comparable improvement is achieved in controlling symptoms of OAB, TENS therapy shows superior results in terms of resolution of constipation, and frequency of LUT infections.

2 11:58

### **Selective alpha1-blockers in the treatment of primary bladder neck hypertrophy in children.**

Hanna Szymanik-Grzelak, Maria Daniel, Anna Wabik,  
Małgorzata Pańczyk-Tomaszewska,

*Department of Paediatric Nephrology, The Medical University of Warsaw, Warsaw, Poland*

**INTRODUCTION:**

Bladder neck hypertrophy may be primary or secondary to the anatomical obstruction of the bladder. Alpha1-blockers are used in the treatment of bladder neck obstruction in children. The effect of the doxazosin on urodynamic parameters and clinical signs in children with primary bladder neck hypertrophy (PBNH) were studied.

**METHODS:**

A single center retrospective analysis was carried out. During a 5-year period, 46 (45 boys, 1 girl) out of 738 children with micturition disorders, were PBNH diagnosed. In children with PBNH cystography and cystoscopy were performed before treatment and abdominal ultrasound, uroflow and urodynamic studies were conducted pre- and post-treatment. Selected patients were administered doxazosin  $1.0 \pm 0.4$  mg/day. Primary outcome was to evaluate the efficacy of PBNH treatment with alpha1-blocker in children.

**RESULTS:**

Symptoms of PBNH in children were: urinary tract infections (63.0%), nocturia (17.4%), difficulty with micturition (13.0%), urgency/frequency (21.4%), urinary tract dilatation (26.0%), vesico-ureteral reflux (45.6%). Leak point pressure (LPP) was mean  $62.3 \pm 26.3$  cm H<sub>2</sub>O, Pdetmax was mean  $93.6 \pm 29.5$  cmH<sub>2</sub>O, Qmax was mean  $14.7 \pm 5.5$  ml/s. In 30% of children, mean 40 ml of residual urine after micturition was found. In the cystoscopy, PBNH was diagnosed without the anatomical obstruction of the bladder outlet. Doxazosin was used for mean  $27.7 \pm 20.6$  months. In all children: disappearance of nocturnal enuresis, difficulty in starting micturition and frequency; resolution of vesico-ureteral reflux (47.6%) and residual urine after micturition (86%); decreasing of mean LPP from 62,3 to 51,4 cm H<sub>2</sub>O and mean Pdetmax from 93,6 to 65,5 cm H<sub>2</sub>O, increasing mean Qmax from 14,7 to 18,6 ml/s was observed.

**CONCLUSION:**

Doxazosin is effective in reducing bladder outlet hypertrophy on pressure flow studies and clinical signs in children with primary bladder neck obstruction.

**The management of stress urinary incontinence in children.**

Katarzyna Józefowicz<sup>1</sup>, Agata Lakomy-Gawryszewska<sup>2</sup>,  
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**INTRODUCTION:**

Stress urinary incontinence (SUI) is the involuntary leakage of urine on effort, exertion, coughing or sneezing and is relatively rare in neurologically intact children. SUI may be suspected during medical history taking and may be confirmed by an urodynamic (UD) investigation when involuntary leakage is observed during increasing intraabdominal pressure due to inadequate urethral closure.

**METHODS:**

Initial treatment consisted of standard urotherapy (re-educating the child and family on the correct position during micturition, frequency of voiding and obligatory fluid intake) and a standardized schedule of animated biofeedback training of pelvic floor muscles (PFM) for 8 weeks. This consisted of daily sessions with an urotherapist for 5 consecutive days, followed by weekly sessions for the following 7 weeks. Each session consisted of 30 repetitions of 5 s contraction and 10 s relaxation of the pelvic floor muscles. The duration of physiotherapy (8 – 24 weeks: median of 16 wks). The frequency of SUI was evaluated at baseline and after treatment with ongoing monitoring for compliance to urotherapy.

**RESULTS:**

Prior to treatment the frequency of stress incontinence was noted to be 15-30 episodes per month. Following standard urotherapy and at least 8 weeks of physiotherapy 5/9 girls observed reduction of wetness (it is still about 15 incidents during a month but it is not so large amount of urine leakage). They reported that they had acquired the ability to stop urine leakage or reduce it to the loss of several drops following laughter, sneezing or physical activity. 4/9 of children did not report improvement following biofeedback training and the frequency of SUI remained unchanged. Irrespective of improvement in SUI symptoms all subjects continued to demonstrate correct bladder capacity, correct urine flow and absence of residual urine by uroflowmetry.

**CONCLUSION:**

Animated biofeedback training help to improve their strength of PFM. It can be a helpful noninvasive method in a significant number of children with stress urinary incontinence.

**4** 12:14

### **Characterization of asymptomatic bacteriuria and resistance to antibiotics in patients with neurogenic bladder who perform clean intermittent catheterization.**

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1. Dana-Dwek Children's Hospital, Tel-Aviv Medical Center,

2. Alyn Hospital, Jerusalem

**BACKGROUND:**

Asymptomatic bacteriuria among patients with neurogenic bladder who perform clean intermittent catheterization (CIC) is prevalent. We aimed to evaluate the prevalence of asymptomatic bacteriuria and to characterize patterns of resistance to antibiotics.

**PATIENT AND METHODS:**

Routine urine cultures were collected before urodynamic studies in patients with neurogenic bladders who perform CIC. None of them had symptoms of urinary tract infection at the time of specimen collection. Cultures were defined as being positive if a single bacterial species was isolated, together with a growth of over 10000 colony-forming units/ml. Resistance patterns were defined as extended spectrum beta lactamase (ESBL), resistant to 3 antimicrobial groups (multi-drug resistant, MDR), and extensive drug resistance (resistant to all but 2 or fewer antimicrobial groups, XDR). Results- 281 urine cultures were available for 186 patients (median age 7 years, range 0.6-18) during 2010-2018. Common etiologies for CIC included spina-bifida (68%), spinal cord injury (5%), and sacral agenesis (5%). Vesicoureteral reflux was diagnosed in 36 patients (19%), and 13 of them were treated with prophylactic antibiotics. Asymptomatic bacteriuria was found in 206 specimens (73%). Prevalent bacteria species were E.coli (75%), Klebsiella (13%) and Proteus (11%). ESBL bacteria were found in 11% of the positive cultures, MDR in 16%, and one patient had XDR bacterium.

**CONCLUSION:**

Asymptomatic bacteriuria is common among patients who perform CIC, with a relatively high prevalence of resistance patterns. Decreasing unnecessary antibiotic treatment in patients without signs of active infection is imperative in order to avoid increased resistance to antibiotics.

**5** 12:22

### **Need for Urine Culture in Pediatric Urodynamic Studies.**

Cristian Sager, Carol Burek, Felicitas Lopez Imizcoz, Javier Ruiz, Santiago Weller, MarianelaSanmartino, Juan Pablo Corbetta,

National Hospital of Pediatrics Garrahan, Buenos Aires, Argentina

**INTRODUCTION:**

There are controversies with urine cultures and antibiotics peri Urodynamic studies (UDS) in children. In our institution, negative urine culture is requested before UDS. This implies time, economic cost and effort of parents and health system.

**PURPOSE:**

To reassess the utility of routine negative urine culture before UDS in children. Detect risk factors to have a positive urine culture in the moment of UDS.

**MATERIAL AND METHODS:**

UDS was indicated in 212 patients in a period of 6 months. The main cause of bladder dysfunction was spina bifida and 66, 6% perform clean intermittent catheterization (CIC). Positive urine culture was defined as 105 CFU/ml. Febrile UTI was defined as new symptoms with fever (38.5°C). Urine culture was performed 15 days pre UDS (UC1), and if positive, adequate antibiotics were indicated and the urine culture repeated (UC2) before the study. During the instrumentation in the UDS, a new urine sample was obtained (UC3). All patients, with or without positive UC3, were followed up 15 days after the UDS. Univariate and multivariate analysis was performed to detect risk factor for UC3+.

**RESULTS:**

Of the 212 patients chosen, 92 patients (43%) had a positive UC1. All except for two, negativize UC2 with adequate antibiotic treatment. Nevertheless, 65 patients (30%) had a positive UC3 intra UDS and only 1 patient had a febrile UTI that required EV antibiotic treatment which represents 1,5%. The total incidence of febrile UTI post procedure was 0,4%. There was a association between the history of bacteriuria in the last year, CIC and UC3 + ( $p < 0.0001$ ).

**CONCLUSION:**

Routine UC previous to UDS in pediatric patients might be unnecessary. Despite the effort to negativize the UC, 30% had a positive UC in the moment of the study. However only 0,4% had a febrile UTI with no major complications.

**6** 12:30**Comparison of uroflowmetry with and without urethral catheterization.**

Stacy Tanaka, Caroline Kang, Abby S Taylor, Douglass B Clayton, John C Thomas, John C Pope, Mark C Adams, John W Brock,  
*Vanderbilt University Medical Center, Nashville, US*

**INTRODUCTION:**

Uroflowmetry is a first-line test for children with suspected lower urinary tract dysfunction. However, children often produce inadequate voided volumes. Urodynamic studies can be useful in evaluating bladder function but requires urethral catheterization. We sought to compare uroflowmetry during non-instrumented (NIF) versus urodynamic studies (UDS-IF) to determine whether urethral catheterization affects study parameters.

**METHODS:**

Children without neurogenic bladder dysfunction undergoing pelvic muscle rehabilitation from April 2015 to June 2017 were retrospectively reviewed. Children who had undergone both NIF and UDS-IF within 3 months were included. We calculated estimated bladder capacity by age. We compared maximum urine flow rate (Qmax), voided volume, flow curve pattern, and pelvic floor patch electrode EMG pattern between UDS-IF and NIF for each patient.

**RESULTS:**

A total of 71 children underwent both UDS-IF and NIF. Only 25% of flow studies during NIF were adequate based on voided volume of 50% of estimated bladder capacity; in contrast, 92% of flow studies during UDS-IF were adequate. When limited to studies with adequate voided volumes, flow patterns were the same in 54% of patients and Qmax did not vary significantly (mean Qmax UDS-IF 28.5 ml/s, mean Qmax NIF 24.7 ml/s,  $p = 0.5$ ). When comparing all studies, flow patterns were similar in 28% of patients and Qmax was significantly higher in UDS-IF compared with NIF (mean UDS-IF Qmax 27.4 ml/s, mean NIF Qmax 15.2ml/s,  $p < 0.0001$ ). Pelvic EMG patterns were the same > 75% of the time regardless of whether the studies were adequate based on voided volume.

**CONCLUSIONS:**

The majority of children had inadequate voided volumes on NIF and Qmax was significantly lower than that obtained during UDS-IF. Flow patterns matched between UDS-IF and NIF if voided volumes were adequate. Pelvic floor EMG patterns were not affected by urethral catheterization or amount voided.

**7** 12:38**Introduction and validation of a new composite score of urodynamic parameters to predict upper tract damage in children with neuropathic bladders.**

Arash Taghizadeh, Roma Varik, Eskinder Solomon, Anne Wright,  
*Evelina London Children's Hospital, London, UK*

**INTRODUCTION:**

Urodynamics generates multiple parameters, some with disputed cut-offs. A score that combines these parameters would have benefits in stratifying and comparing results. We devised a new composite urodynamics score (CUS). We hypothesised that the CUS would change with a recognised bladder intervention and that its value would differ in those with and without renal damage. The CUS was tested in children with neuropathic bladders treated with botulinum toxin A (BotA).

**METHOD:**

We retrospectively reviewed urodynamics of children (aged below 16 years) with neuropathic bladders who underwent their first bladder BotA treatment. Individual parameters and CUS were compared before and within three months after BotA. The parameters included the cystometric capacity, baseline pressure rise, DLPP, magnitude of DO, sensation, trabeculation, VUR, DSD and incomplete emptying. The CUS included each of these, giving a score 0-11. Renal damage was assessed on ultrasound and DMSA scanning. Results are given as median (IQR) and compared using Mann-Whitney.

**RESULTS:**

Between 2008-2018 68 children with neuropathic bladders had their first BotA. Requisite urodynamics were available for 34, age 6.8 (3.5-9.5) years. Following BotA there was a statistically significant change in cystometric capacity from 118 (70.8-191.8) to 221 (150.0-273.3) mls and in peak DO from 59 (35.5-80.5) to 43 (35.0-60.5) cm/H2O; other individual parameters did not change significantly. CUS change from 5 (4.0-6.25) to 4 (3-5.25) was statistically significant. Renal damage was identified in 17 patients. When compared to those with normal kidneys, there was no difference in their cystometric capacity or peak DO. However, CUS was significantly higher in those with renal damage compared to those without; 6 (4.0-7.5) and 5 (4.0-5.5) respectively.

**CONCLUSIONS:**

The CUS show promise; it changes following BotA treatment, and its value significantly differed between those with and without renal damage in a way that individual parameters did not.

8 12:46

### **The connection between social dryness and early introduction of conservative treatment in children with neurogenic bladder caused by congenital spinal cord defect.**

Dominika Smyczek, Klaudia Korecka,

*John Paul II Upper Silesian Child Health Centre in Katowice, Pediatric Surgery and Urology, Katowice, Poland*

**INTRODUCTION:**

The most common cause of the neurogenic bladder in children are neural tube defects, including myelomeningocele. Understanding the pathophysiology of the neurogenic bladder allowed for the introduction of various techniques of treatment to control urination. Properly treated neurogenic bladder allows patients to better function in society thanks to the so-called dryness which means the ability to control urination between catheterization.

**AIM OF THE STUDY:**

The aim of the study is to evaluate if the early introduction of conservative neurogenic bladder treatment in children after myelomeningocele (MMC) surgery increases the degree of social dryness.

**MATERIAL AND METHODS:**

The analysis involved 195 patients after pre- and post-natal MMC repair. Patients were divided into 3 groups depending on the time of introduction of conservative treatment of the neurogenic bladder. Parameters from the history and clinical course were evaluated in terms of the degree of social dryness. The ability to hold urine was determined on a scale: dry, rather dry, rather wet and wet, the comparison was made in the group of children >= 5 yrs. In the study group there were patients catheterized by the urethra, as well as by a created suprapubic fistula to urinate.

**RESULTS:**

Catheterization had a statistically significant effect on obtaining dryness.

**CONCLUSION:**

Early (in the neonatal period) introduction of conservative treatment contributes to a better social dryness. Urinary catheterization is improved by catheterization through the formation of suprapubic stoma for catheterization. The treatment of constipation improves social dryness.

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