Urinary incontinence in children

Prof Dr Rien JM Nijman
Chair Department of Urology
University Medical Centre Groningen
The Netherlands

j.m.nijman@uro.umcg.nl

Introduction
The different causes and treatment modalities of enuresis (night-time incontinence) and day-time incontinence will be discussed. The definitions used will be those according to the ICCS standardization report (1). The ICI chapter on the management of urinary and faecal incontinence gives a comprehensive overview of this topic in much more detail (2).
Many children can not control their bladders for various reasons and may be wet both during the day and the night. By definition they have enuresis and daytime incontinence (as is the case in many of the congenital abnormalities such as spina bifida, ectopic ureters, bladder exstrophy and epispadias).

Enuresis (nocturnal enuresis)
Children who wet the bed during sleep may do so because their bladder capacity is not sufficient for normal diurnal urine production (which is diminished because of the depressive action of vasopressin during the night), or because urine production exceeds normal bladder capacity, or because the signal from the bladder to the brain indicating that bladder emptying is eminent is not recognised and proper action (going to the toilet) is not initiated. There is still uncertainty about the fact whether these children sleep very deeply or have an arousal disturbance. Different treatment modalities are available, but combinations seem to be more successful (cognitive treatment + alarm + DDAVP / anticholinergics). Relapse rates are lowest following alarm treatment.

Daytime incontinence
The normal bladder is by nature a structure that want to contract continuously: the central inhibition is necessary for normal bladder control. This can only be attained when the necessary neurological structures are there and functioning correctly. When for some reasons this central inhibition fails (immaturity of the neurons / synapses) urinary incontinence may occur. The most common cause is OAB (overactive bladder). Frequency and urge are often present, as well as recurrent urinary tract infections and bowel dysfunction. A good history, in combination with physical exam, bladder diaries and uroflowmetry + residual urine measurement will most often provide sufficient information to start treatment (standard therapy, urotherapy, anticholinergic medication and treatment of infections and constipation). When normal co-ordination between the detrusor contraction and pelvic floor muscle relaxation during voiding is missing, Dysfunctional Voiding is present. Although this may not cause symptoms in all children, in those who do develop symptoms, incontinence and recurrent UTI's are the main complaints. The bladder may be overactive, but the storage function is sometimes normal. Abnormal flow patterns, as well as abnormal voiding habits and residual urines can easily be confirmed by simple means (history, bladder diaries and flow + residual). Treatment is aimed at
restoring normal voiding and emptying of the bladder by urotherapy (biofeedback, physiotherapy) and treatment and preventing UTI's and constipation. Only when initial management fails, or when there is a suspicion of other pathology further invasive investigations are indicated (urodynamic studies, cystoscopy, VCUG).

In children with incontinence and episodes of UTI with fever, VUR should be ruled out (upper tract imaging and VCUG). Other problems such as underactive detrusor (voiding without a detrusor contraction and residuals + UTI + usually constipation), giggle incontinence, vaginal entrapment during voiding and the non-neurogenic neurogenic bladder are less common and sometimes more difficult to treat and are best referred to a specialized centre.

Anatomic abnormalities
Children born with bladder extrophy, epispadias and cloacal abnormalities are usually diagnosed at birth, although in some of these children the diagnosis is only made because they fail to become continent at the expected age. Most will need extensive surgical interventions in order to obtain a degree of dryness. Normal voiding is usually not possible. The use of CIC is rather the rule than the exception in this group of patients. In children with a neurogenic abnormality (MMC, anorectal malformations, teratomas etc) the early start of CIC and later CISC in combination with anticholinergic medication, antibiotic prophylaxis and a rigorous bowel protocol may render many of them ‘continent’ with normal upper tracts without the need for bladder augmentation and/ or continent diversion. But if conservative measures fail these procedures can also in small children be safely preformed with the need for close and long term follow-up (stones, metabolic changes etc).

Literature