

Leading Article

Don't forget the bladder, doctor!

T L Chambers¹

Sri Lanka Journal of Child Health, 2003; **32**: 3-5

(Key words: detrusor instability, pollakiuria, neurogenic bladder)

When a child has a urinary tract infection (UTI), paediatricians are concerned lest this brings to light some abnormality of the urinary tract, which might jeopardize renal function in the future. Hence a lot of the debate around UTI has been about which imaging investigations would be most appropriate. Much effort is directed towards finding abnormalities of the upper urinary tract (vesicoureteric reflux - VUR) and the kidney parenchyma (scarring or dysplasia). Paediatricians have paid less attention to the bladder unless it has been involved in a process such as out-flow obstruction due to posterior urethral valves. Most bladder disorders are common, not serious, and easy to treat but rarer ones may be more damaging to kidney function

Bladder (or detrusor) instability¹

When taking the history of a child with UTI it is important to ask about bladder function. Does the child empty his or her bladder more or less frequently than other children of comparable age? Do they experience urgency or hesitancy and do they leak with increasing abdominal pressure such as giggling or coughing? Bladder function during sleep should be assessed - does the child wet the bed? Does he or she get up at night to empty the bladder? Finally, does he or she hold on to urine and try to suppress the urge to micturate by adopting unusual postures such as heel pressure in the perineum or performing a so-called "war dance" in the effort to suppress the urge²? Bowel function should also be assessed; incontinence, encopresis, constipation³ and other functional bowel disorders should be discovered and treated if necessary. Otherwise they may predispose to recurrent UTI.

A characteristic patient is a child of 5 or 6 years who has recently started at school and does not like using its lavatories. They may not be private, be offensive smelling or be a place where bullying takes place.

The child then holds on to his or her urine for the whole of the school day, rushing home for sweet release on the family lavatory. This behaviour leads to UTI with frequency, urgency and dysuria. These symptoms may cause anxiety and perpetuate the bladder symptomatology. In this way an unstable bladder is created. Incomplete voiding becomes established and the child's life becomes a misery. In such cases ultrasonography of the urinary tract usually shows normal kidneys but there may be some thickening of the bladder wall and incomplete emptying. It is very important to ask the ultrasonographer to check whether bladder emptying is complete and what volume of urine remains unvoided.

The management offered to parents and sufferers of such a condition should include preventive antibiotics - recurring infections perpetuate the cycle of unpleasant symptoms and the tendency to functional bladder symptoms. Antispasmodic therapy with drugs such as oxybutynin⁴ is effective with less adverse effects than in adults. The treatment should be started at a low dose and gradually increased until symptoms regress or side effects (dry mouth, pink sclerae or constipation) occur. The aim of treatment is to lessen and cure frequency and urgency and promote greater self-confidence in the child in his or her ability to control the bladder. Too many of these children are controlled by their bladders rather than controlling them. Anxiety at the prospect of incontinence only makes the sensation of "wanting to go" stronger; no wonder these children find it difficult to concentrate on their lessons. The constipating complication of oxybutynin is important to anticipate with the parents. Supportive measures to treat bladder instability include explanation to the child, parents and school with a request for leniency in allowing the child unfettered access to lavatories. Simple bladder retraining and cognitive therapy are also helpful but more interventionist behavioural approaches may be needed⁵. Clean intermittent self catheterisation (CISC) may be helpful in cases where there is incomplete bladder emptying and incontinence. If there is doubt about the diagnosis

¹Consultant Paediatrician, Renal Unit, Bristol Royal Hospital for Children, United Kingdom.

then non invasive urodynamic investigations such as flow studies should settle whether this is a functional disorder (when there will be detrusor contraction during bladder filling as the child attempts to inhibit micturition) or whether the child has a neurogenic bladder. Spinal cord imaging should be done if there is doubt about this or if there are other symptoms or signs suggesting a cord lesion. Nocturnal enuresis that may accompany bladder instability should be treated. If oxybutynin is being used then it can be given on a twice-daily basis or in the morning only and with a tricyclic agent in the evening. Alternatively a buzzer alarm may be used and/or desmopressin. A support group for children (ERIC - Enuresis Support and Information Centre - www.eric.org.uk) exists in the UK and parents find it very helpful. It is very important to identify bladder instability because it is simple to treat and with supportive follow up a child's life may be transformed. This is likely to do as much good for a larger number of children than spotting the occasional case of end stage renal failure associated with UTI.

Pollakiuria⁶

Younger children may develop the strange condition known as pollakiuria (puppy bladder syndrome). This is characterised by the sudden onset of extreme urinary frequency. These children may empty their bladders every 10 minutes or so but rarely get up to void at night or wet the bed. The cause is unknown and urine culture is usually negative with normal ultrasonographic findings. Antispasmodics do not help, nor indeed does any other treatment. The child needs to be spared invasive investigations and the parents reassured that the condition is common and will regress. I suspect that most children have it at some time in their lives but it is usually brief and only lasts a day or so. Repeated episodes are not uncommon.

Chronic dysuria and lower abdominal pain

Children may experience functional bladder or urethral pain. Dysuria is a characteristic of lower UTI which can be easily recognised and treated. However, some children, particularly those who have had dysuric UTI, may continue with painful micturition for many months. Others experience the symptom without any obvious precipitating infections. It is important to examine the perineum - with the child's consent; lichen sclerosus in either sex may cause these symptoms. Investigations are normal. These are a difficult group of patients to treat. The symptom is distressing and causes understandable parental concern. It has been speculated that these children might

have chronic infection with microorganisms that are difficult to grow or that infection may induce structural changes to bladder surface epithelium, which make it more sensitive. Rare conditions such as hypercalciuria or stone disease need to be excluded. Management has to be supportive. If urinary tract infections occur, then these should be treated and prophylaxis considered. Non-specific and non-evidence based treatments might be helpful. Cimetidine has been used in adults⁷. Cranberry juice helps some but others dislike it. Occasionally threadworms or some dietary constituent are revealed as the cause. However, in most cases, the approach has to be one of managing chronic pain syndromes in childhood with firm and regular supportive consultations and the use of cognitive behaviour therapy to try and divert attention away from symptoms. This is usually more effective if carried out by a psychologist.

Occult neurogenic bladder

Sometimes called Hinman syndrome³, this is characterised by a much thicker walled bladder (fir tree bladder) and secondary changes in the upper urinary tracts jeopardising renal function. There are no neurological signs (hence the description occult neurogenic bladder). The cause is unknown although many feel that psychological factors in early childhood life are important. However, one does see children where this is not the case. It is likely that an explanation will emerge which will involve local problems with neurogenic transmission but these are yet to be identified. Urodynamic assessment is essential and the treatment is to initiate CISC. A paediatric urological opinion is valuable particularly for the child who does not respond to simple measures. Reconstructive surgery of the bladder may be required. It is likely that treatment will be required into adult life.

Scarring cystopathy

It is important to be aware of a small number of children (mainly girls) whose functional bladder disorder may have serious consequences for renal function. In these children bladder instability, incontinence and incomplete emptying is associated with (leads to?) VUR, UTI⁹ and is then associated with acute kidney infections causing scarring and loss of kidney function. The customary approach has been to worry about the VUR, whether it should be treated medically or surgically and how it should be followed up in order to prevent progressive scarring. If the bladder instability is not recognised then the process will continue despite apparent optimum management of VUR and UTI. CISC may be needed.

The tantalising question is, of course, whether these children have a series of events consequential on functional bladder disorder or whether they have a unifying functional or yet-to-be determined structural or neurochemical disorder of the urinary tract.

Nephrogenic diabetes insipidus (NDI)

This, and other less severe renal concentrating disorders, produces high volumes of urine, which enlarge and overstrain the bladder musculature. Ureteric dilatation and hydronephrosis may occur¹⁰ and damage the kidneys. Although the obstruction is often mild, it might, if unrecognised, lead to end stage renal failure. Paradoxically the problem may develop silently once the child has become continent and semi-voluntary free bladder drainage ceases (to the relief of parents and the anxiety of the paediatrician). It is important to assess the bladder and upper tracts repeatedly, scanning with bladder full and empty. If progressive ureteric and pelvicalyceal dilatation occurs CISC should be considered. Again collaborative care with paediatric urology is the best management.

Summary

Most functional bladder disorders in children are common, easily overlooked, and may contribute to much childhood misery¹¹. The simple diagnostic and management skills of the general paediatrician may transform a child's quality of life¹². Rarer primary (or possibly secondary) bladder disorders exist and treatment may save the kidneys and life of the child. Skilfully performed bladder ultrasound is the paediatrician's third most helpful diagnostic tool and a paediatric urologist their first ally.

References

1. Fisher R, Frank JD. Detrusor instability: day and night time wetting, urinary tract infections. *Archives of Diseases in Childhood* 2000; **83**: 135-137.
2. Vincent S A. Postural control of urinary incontinence. The curtsey sign. *Lancet* 1966; **ii**: 631-2.
3. Yazbeck S, Schick E, O'Regan S. Relevance of constipation to enuresis, urinary tract infection and reflux. A review. *European Urology*, 1987; **13**: 318-21.
4. Scholtmeijer R J, van Mastrigt R. The effects of oxyphenonium bromide and oxybutynin hydrochloride and detrusor instability. *Journal of Urology* 1991; **146**: 660-2.
5. Kjolseth D. Urodynamic biofeedback training for children with bladder-sphincter dyscoordination during voiding. *Neurological Urodynamics* 1993; **12**: 211-21.
6. Meadow S R. Enuresis. In: Edelman, editor. *Pediatric Kidney Disease* 2nd edition. Boston USA; Little Brown, 1992. p 2019.
7. Dasgupta P, Sharma C, Blackford H N, Dennis P. Cimetidine in painful bladder syndrome: a histopathological study. *British Journal of Urology* 2001; **88**: 183-6.
8. Hinman F. Urinary tract damage in children who wet. *Pediatrics* 1974; **54**: 143-50.
9. Koff S A, Lapdes J, Piazza D H. Association of urinary tract infection and reflux in uninhibited bladder contractions and voluntary sphincteric obstruction. *Journal of Urology* 1979; **122**: 373-6.
10. Gough D C S. Upper tract obstruction pathophysiology and diagnosis. In: Thomas D F M, Rockwood A M K, Duffy P G, editors. *Essentials of Pediatric Urology*. London UK; Martin Dunitz, 2002: p 57.
11. Meadow S R. Daytime wetting. *Pediatric Nephrology* 1990; **4**: 178-84.
12. Gerharz E W, Eiser C, Woodhouse C R J. Current approaches to assessing the quality of life in children and adolescents. *British Journal of Urology International* 2003; **91**: 150-4

