URINARY INCONTINENCE AND URINARY INFECTION

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Urinary incontinence

Types of incontinence

- Stress incontinence
- Urge incontinence
- Continuous incontinence

Urinary incontinence is a common reason for referral to a urologist, but the exact prevalence in the community is unknown as many patients conceal their symptoms because of embarrassment.

Urge incontinence

- Urge incontinence is leakage of urine preceded by an urgent desire to pass urine
- Usually the patient is incontinent before reaching the toilet
- Urge incontinence is more common in women—usually the result of idiopathic instability of the bladder
- The condition can occur de novo in men but is seen more often in the presence of outflow obstruction of the bladder
- Recent studies suggest that obstruction leads to neural degeneration and connective tissue deposition in the bladder wall and hypersensitivity to local neurotransmitters
- Urge incontinence may occur after spinal trauma or other spinal cord disorders that lead to the development of a neuropathic bladder

Stress incontinence

Stress incontinence describes leakage of urine in response to any physical activity that raises intra-abdominal pressure, such as coughing, sneezing, bending down, and any exercise. It occurs most often in women but is also seen in men after transurethral resection of the prostate (after damage to the external urethral sphincter). About 50% of all women aged over 18 years will have mild stress incontinence. Stress incontinence in women commonly develops after childbirth and is thought to be due to a pressure denervation of the pelvic floor. Obesity may worsen the symptoms—dieting may bring about an improvement, although patients who are incapacitated by incontinence often find it difficult to lose weight.

Continuous incontinence is the continual leakage of urine by day and by night

Continuous incontinence

Continuous incontinence in men usually implies chronic urinary retention with overflow, which develops insidiously with outflow tract obstruction from any cause. Continual leakage of urine in women is usually due to fistulas involving the urinary bladder, and vesicovaginal fistula is particularly common after hysterectomy.

A patient surviving all day on one change of underwear has milder symptoms and is less likely to be helped by intervention than someone who uses incontinence pads in large quantities

Investigations

When incontinence is seen in general practice the first decision to be made is whether the patient needs a urological assessment—this will depend largely on the wishes of the patient. It is crucial to determine how wet the patient is, and this is easily assessed by determining how much protection is needed each day.

Patient undergoing video cystometrography.

Cystometrogram showing unstable detrusor contraction, which occurs when patient coughs. Intrinsic pressure is generated by detrusor muscle of bladder. Unstable contraction is genuine because rectal trace is flat.

The investigation of choice for both stress incontinence and urge incontinence is video cystometrography, an outpatient procedure lasting about half an hour. The patient lies on an x ray table after emptying his or her bladder, and catheters attached to pressure transducers are inserted into the bladder (through the urethra) and also into the rectum. The bladder is filled with a mixture of saline and x ray contrast medium at a rate exceeding 100 ml/min. The pressure recorded from the rectum (indicative of intra-abdominal pressure) is displayed on a video monitor together with the intravesical pressure. Detrusor pressure is derived by subtraction of the intra-abdominal pressure from the intravesical pressure. As the bladder fills the detrusor pressure is continually monitored and in most cases will not rise much—involuntary phasic contractions exceeding 15 cm H₂O pressure are diagnostic of an unstable bladder, which may be the cause of urge incontinence.

When the patient signals that the bladder is full, the filling is stopped and the patient is asked to stand. Provocative acts such as coughing and straining may be performed while the bladder is screened fluoroscopically to determine the degree of bladder neck descent. Finally, the patient is asked to void to completion while the detrusor pressure and the flow rate are calculated. Generally, a detrusor pressure higher than three times the flow rate indicates outflow obstruction.

To investigate continuous incontinence other procedures are needed, such as intravenous urography, cystography, and cystoscopy. The choice of investigations will depend on the clinical history.

Treatment of stress incontinence

- Weight loss—may help but is often difficult to achieve
- Pelvic floor exercises using vaginal weights
- Surgery

Management

Patients with mild symptoms from whatever cause may be able to manage with incontinence pads or by changing underwear during the day. Such patients may be greatly helped by advice and support from a continence adviser or community nurse working with the general practitioner.

Vaginal cones for incontinence. Weights (left) are placed inside cones (right), which are then inserted into vagina.

Women with mild symptoms and minimal bladder neck descent on video cystometrography may benefit from pelvic floor exercises. These are taught by specialist advisers in most urology departments and are easily done with vaginal weights—usually plastic cones inserted into the vagina. The patient is taught to increase tone in the pelvic floor by holding on to the weights for a specified period.

Surgical intervention is needed for more severe symptoms and when bladder neck descent is seen in the video cystometrogram. Endoscopic bladder neck suspension relies on nylon sutures passed either side of the bladder neck between the vagina and the anterior abdominal wall to restore the bladder neck to its normal intra-abdominal position. This allows intra-abdominal pressure to be transmitted equally on all parts of the bladder including the sphincter region of the bladder neck.

Treating neuropathic or unstable bladder

- Urge incontinence due to an unstable or neuropathic bladder may be treated with anticholinergic drugs such as oxybutynin
- Patients should be warned about the side effects of a dry mouth and blurred vision
- Severe bladder instability is treated with a clam ileocystoplasty, in which the bladder is opened up like a clam and the defect closed with a patch of ileum. This abolishes the instability

For severe bladder neck descent an open colposuspension procedure is usually needed. Through a Pfannenstiel's incision the bladder neck is dissected and sutures tied between the vaginal tissue on both sides of the bladder neck and either the obturator fascia or the pectineal ligament. When tied, these sutures raise a shelf of tissue which acts to restore the bladder neck to an intra-abdominal position.

Men with stress incontinence after transurethral resection of the prostate are sometimes helped by pelvic floor exercises but may need insertion of an artificial sphincter to control leakage.

Urinary tract infection

Features of urinary tract infection

- Urinary tract infection in adults is common, particularly in women
- Cystitis produces symptoms of frequency, dysuria, and urgency
- Ascending infection causes pyelonephritis, which typically presents with loin pain, fever, and malaise
- Urinary tract infection may be less common in men because the extra urethral length prevents bacterial colonisation of the bladder

Bacterial adherence to the urothelial surface is an important first stage in the development of urinary tract infection. Bacterial adhesins produced by pili on the bacterial surface seem to interact with specific receptors on the urothelial surface. Attachment to successively higher receptors may lead to ascending infection in the absence of vesicoureteric reflux. *P fimbriae* seem to be the major virulence factor possessed by *Escherichia coli*, and this factor is associated with increased pathogenicity.

Management in adults

Lower urinary tract infection may be diagnosed by dipstick urine analysis. The leucocyte esterase test detects pus cells in urine, while bacteria in the urine that reduce nitrate to nitrite can be detected by the nitrate reductase test. Commercially available strips that combine these two tests may be used in uncomplicated infections. Where doubt exists, and certainly for more serious infection, a midstream sample of urine should be sent for microscopy and culture to confirm the presence of bacteria and pyuria and to allow testing for sensitivity to antibiotics.

Repeated episodes of cystitis in a woman or a single urinary tract infection in a man need to be investigated—an x ray examination of the kidneys, ureters, and bladder, and a renal ultrasound examination will exclude upper tract abnormalities including stones. Serious reflux is unlikely if no renal scarring is seen in an ultrasound scan, and a voiding cystourethrogram is not needed. An ultrasound scan of the bladder combined with uroflometry will detect a residual volume and show the flow rate profile. When obstructive symptoms predominate, a cystoscopy and urethral dilatation may be needed in women to prevent further infection. Flexible cystoscopy in men may help to exclude local obstructive causes such as urethral stricture, and if an obstructive prostate is detected then a transurethral resection of the prostate can be arranged.

Five stages of vesicoureteric reflux.

Prevention of urinary tract infection in women

- Maintaining adequate fluid intake
- Ensuring that bladder is fully empty
- Emptying bladder after sexual intercourse

Single episodes of documented infection in otherwise normal women need no special investigations, but preventive advice should be given.

Uncomplicated urinary infection usually responds to a three day course of antibiotics, and longer treatments are not needed.

Pregnancy

- Urinary tract infection is common in pregnancy
- It may lead to acute pyelonephritis which, before antibiotics, was responsible for a high rate of premature delivery and high perinatal mortality
- Women should be screened for bacteriuria at the first prenatal visit—if present, this should be treated with antibiotics

Interstitial cystitis affects predominantly middle aged women, leading to fibrosis of the bladder wall. The main symptoms are frequency, urgency, and suprapubic pain especially when the bladder is full. This condition is often misdiagnosed as recurrent lower urinary tract infection, although the midstream urine is almost always free of infection. Patients presenting with these symptoms and no growth on urine culture should therefore be referred to a urologist for further investigation. In both men and women the possibility of bladder carcinoma mimicking symptoms of infection should be excluded by urine cytological analysis—and cystoscopy and biopsy, if necessary.

Management in children

Collecting urine specimens to confirm the diagnosis of urinary tract infection is more difficult in children. A midstream sample can be collected from older children, but in younger children a sterile bag placed over the genitalia to catch the urine may be needed. Suprapubic aspiration of the bladder is seldom required.

Treating uncomplicated infections for 3–5 days with antibiotics usually suffices. All children with a urinary infection should be investigated. An ultrasound scan or intravenous urogram will show abnormalities of the upper tracts. A voiding cystourethrogram should be performed to look for bladder outlet obstruction or vesicoureteric reflux. Sexual abuse as a cause of urinary infection in children should not be forgotten.

Urinary tract infection in children

- Only 1% of boys aged under 11 years develop a urine infection, but the incidence is three times as high in girls. Most such infections occur in the first 12 months of life
- The greatest danger in such children is the development of upper tract infection and subsequent renal scarring
- Vesicoureteric reflux accompanies urinary tract infection in children in 20–50% of cases. Although reflux may be the cause of infection, episodes of infection may lead to transient reflux
- Vesicoureteric reflux alone is not sufficient to cause renal cortical scarring—infection must also be present

Common urinary bacterial pathogens

- *Escherichia coli*
- *Streptococcus faecalis*
- *Proteus* spp
- *Pseudomonas* spp
- *Klebsiella* spp

Repeated infections should be treated accordingly. Prophylactic antibiotics may be needed if more than three infections occur during six months. Preventive measures should be explained to the parents in all cases, including the importance of adequate fluid intake and the avoidance of constipation.

If vesicoureteric reflux is discovered then conservative management is appropriate initially. Higher grades of reflux are unlikely to settle spontaneously, but lower grade reflux—that is, not reaching the renal pelvis—may settle without intervention. Surgery is likely to be needed if repeated infections occur while the child is taking prophylactic antibiotics, if antibiotic compliance is low, or if reflux persists after lengthy surveillance.

Key reference

Reid G, Bruce AW. Factors influencing the adhesion of uropathogens to the uroepithelium. *Current Opinion in Urology* 1993;3:21–4

The illustration of the patient undergoing video cystometrography was provided by Dr Jean Marshall, Edith Cavell Hospital, Peterborough.

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