4) Urinary Incontinence - Dr. Abeer

INTRODUCTION

- Involuntary loss of urine
- Social and hygienic problem
- It affects individuals physical, psychological and social which is associated with a significant reduction in quality of life
- The prevalence increases with age
- 5% of women between 15-44 years of age being affected
- Increases to 10% between 45-64
- Increases to 20% > 65 years
- Higher in women in residential nursing homes about 40%
- To hold urine & control urination, the lower urinary tract and nervous system need to be working normally
- The average adult bladder can hold over 2 cups (350 ml - 550 ml) of urine. Two muscles are involved in controlling urine flow:
  - The sphincter, which is a circle-shaped muscle around the urethra. You must be able to squeeze this muscle to prevent urine from leaking out.
  - The detrusor, which is muscle of bladder wall, this must stay relaxed so that the bladder can expand
- Continence and micturition involve a balance between urethral closure and detrusor muscle activity.
- Urethral pressure normally exceeds bladder pressure, resulting in urine remaining in the bladder.
- Intraabdominal pressure increases (from coughing and sneezing) are transmitted to both urethra and bladder equally, leaving the pressure differential unchanged, resulting in continence.
- Normal voiding is the result of changes in both of these pressure factors: urethral pressure falls and bladder pressure rises.

CLASSIFICATION

Stress incontinence:

- Urethral causes: involuntary leakage of urin during ↑ abdominal pressure in absence of a detrusor contraction
- is involuntary urine leakage on effort or exertion or on sneezing or coughing. (loss of support of the urethra which is usually a consequence of damage to pelvic support structures as a result of childbirth)
- Abnormal descent of the bladder neck and proximal urethra, so there is failure of equal transmission of intra abdominal pressure to the proximal urethra, leading to reversal of the normal pressure gradient between the bladder and urethra with negative urethra closure pressure
- Laxity of sub urethral support normally provided by the vaginal wall, endopelvic fascia, arcus tendineus fascia and levator ani muscles acting as asingle unit results in ineffective compression during physical stress and consequent incontinence

Aetiology of USI

- Damage to the nerve supply of the pelvic floor and urethral sphincter caused by childbirth
- Mechanical trauma to the pelvic floor muscles and endopelvic fascia and ligaments during vaginal delivery
- Prolong second stage, large babies and instrumental deliveries
- Menopause and associated tissue atrophy
- Chronic disease (obesity, chronic obstructive pulmonary disaese, constipation)
- Conginital causes( connective tissue and collagen)
Urge incontinence

- suddenly feeling the need or urge to urinate, A common cause of urge incontinence is inappropriate bladder contractions.
- Urge incontinence can mean that the bladder empties during sleep, after drinking a small amount of water, or touch water or hear it running.
- Certain fluids and medications such as diuretics or emotional states such as anxiety can worsen this condition. Some medical conditions, such as hyperthyroidism and uncontrolled diabetes, can also lead to or worsen urge incontinence.
- Involuntary actions of bladder muscles can occur because of damage to the nerves of the bladder, to the nervous system (spinal cord and brain), or to the muscles themselves. Multiple sclerosis, Parkinson's disease, Alzheimer's disease, stroke, and injury—including injury that occurs during surgery—all can harm bladder nerves or muscles.

Detrusor overactivity

- Involuntary detrusor contractions
- Overactive bladder occurs when abnormal nerves send signals to the bladder at the wrong time, causing its muscles to squeeze without warning. Voiding up to seven times a day is normal for many women, but women with overactive bladder may find that they must urinate even more frequently.
- The symptoms of overactive bladder include
  - urinary frequency—bothersome urination eight or more times a day or two or more times at night
  - urinary urgency—the sudden, strong need to urinate immediately
  - urge incontinence—leakage or gushing of urine that follows a sudden, strong urge
  - nocturia—awaking at night to urinate
- Urgency: is complaint of a sudden, compelling desire to void which is difficult to defer
- The combination of symptoms of urgency and frequency is termed OverActive Bladder(OAB)
- This group of symptoms affect quality of life more than stress incontinence
- Women with OAB are more restricted and often there journeys
- Around the location of toileting facilities

Overflow incontinence

- Sometimes people find that they cannot stop their bladders from constantly dribbling or continuing to dribble for some time after they have passed urine. It is as if their bladders were constantly overflowing, hence the general name overflow incontinence.

Retention with overflow

- Failure of bladder emptying may lead to chronic retention and overflow incontinence. Causes:
  - Lower motor neurone or upper motor neurone lesions
  - Urethral obstruction
  - Pharmacological

Symptoms and diagnosis

- Poor stream
- Incomplete bladder emptying
- Overflow stress incontinence
- Recurrent urinary tract infection
- Cystometry to make diagnosis
- Ultrasonography
- Intravenous urogram for any upper urinary tract reflux
- CT may be necessary
Examination

- Any mass that cause compression of the bladder must be excluded, prolapse, vaginal atrophy
- Observation of involuntary loss of urin with coughing may be suggest stress incontinence
- Observation of urin leakage through channels other than urethra from urethra (congenital anomaly, fistula)

**CONGENITAL ANOMALIES**

**Epispadias** (widened bladder neck, shortened urethra, separation of symphysis pubis and imperfect sphincter)

- Patient complains of stress incontinence which may not be apparent when lying down but noticeable when standing up
- X-ray of pelvis will show symphsial separation
- Suprapubic operation to elevate the bladder neck

**Bladder extrophy and ectopic ureter:** absence of the anterior abdominal and bladder wall

**Ectopic ureter** may be single or bilateral, opening is outside the bladder within vagina or perinium

**Fistula**

- Abnormal opening between the urinary tract and the outside
- Causes (obstetric or gynaecological)
  - Obstructive labour
  - Pelvic surgery
  - Pelvic malignancy
  - Radiotherapy
  - It can treated by surgery (isolation and removal of fistula tract, suture and closure of each layer separately without tension)

**URINARY TRACT INFECTION**

- The women have short urethra which is prone to entry of bacteria during intercourse, poor perineal hygiene
- Unefficient voiding ability
- Unnecesary catheterization
- Postmenopausal atrophy and change in vaginal PH
- The common organisms: E-Coli, Proteus mirabilis, Klebsiella aerogenes, Pseudomonas aeruginosa and Streptococcus faecalis

**Symptoms:**

- dysuria, frequecy, hematuria →
- loin pain, fever and riger (acute pyelonephritis has developd)

**Management:**

- Urin stick test, a nitrate can suggest infection. Infection counts ↑
- A culture and sensitivity C/S of midstream specimen of urin is required
- IV or CT urography or renal U/S may be required in patient with recurrent infection
- With acute infection we should send urin for C/S and start antimicrobial therapy, the regimen can be changed later according to the result of the urin C/S
- Trimethoprim 200mg x2 commonly used or Nitrofurantoin 100mg x4 or Cephalosporin
- With recurrent infection which an identifiable source has not been found may be managed by long-term low dose antimicrobial therapy such as trimethoprim.
- Recurrent infection, vaginal oestrogen in postmenopausal women
VOIDING DIFFICULTIES

Failure of bladder emptying this leads to acute or chronic urinary retention, poor stream

_Causes:_

- Failure of detrusor contraction
- Sphincteric relaxation
- Urethral obstruction
- Bladder overdistension

_Symptoms and examination_

- Poor stream
- Incomplete emptying
- Residual urin which leads to frequency and urinary infections
- Full bladder may be palpated
- Any pelvis mass
- Prolapse must be examined
- Vaginal atrophy
- Volumes voided and post void residual urin measure

_Assessment and investigation_

- History-taking and physical examination
- Assessment of pelvic floor muscles
- Assessment of prolapse
- Urine testing
- Assessment of residual urine
- Referral
- Symptom scoring and quality-of-life assessment
- Bladder diaries
- Pad testing
- Urodynamics testing
- Cystoscopy
- Imaging

Bladder stress test—You cough vigorously as the doctor watches for loss of urine from the urinary opening.

Urinalysis and urine culture—Laboratory technicians test your urine for evidence of infection, urinary stones, or other contributing causes.

Ultrasound—This test uses sound waves to create an image of the kidneys, ureters, bladder, and urethra.

Cystoscopy—The doctor inserts a thin tube with a tiny camera in the urethra to see inside the urethra and bladder.

Urodynamics—Various techniques measure pressure in the bladder and the flow of urine

Pad test

- Pad test are used to varify and quantify urine loss
- The pt. wears a pre-weighed sanitary towel, drink 500ml. Of water and rests for 15 min.
- After physical exercise for few min. reweighed the pad again
- If it is > 1 g is considered significant
Uroflowmetry

- Uroflowmetry is the measurement of urine flow rate
- Simple, non invasive procedure can be performed in the outpatient department
- The main indications are difficulty voiding (history of urine retention, neuropathy)
- The normal flow curve is bell shaped is considered abnormal in females
- A flow rate <15 ml/second is considered abnormal in females
- The voided volume should be > 150 ml
- A low peak flow rate and prolonged suggest avoiding disorder

Cystometry

- Measurement of the pressure-volume relationship of the bladder
- It involves abdominal pressure recording in addition to intravesical abdominal pressure monitoring during bladder filling and voiding
- Indication for cystometry:
  - Previous unsuccessful continence surgery
  - Mixed incontinence both stress and urge
  - Voiding disorder
  - Neurogenic bladder
  - Prior to primary continence operation

Normal bladder function

- Residual urine of <50 ml
- First desire to void between 150-200ml
- Capacity between 400-600ml
- Detrusor pressure rise of <15 cm H₂O during filling and standing
- Absence of systolic detrusor contractions
- No leakage on coughing

Other investigation

- Videocystourethrography (Aradio-opaque filling medium is used during cystometry)
- Intravenous urography (indicated in cases of haematuria, uretrovaginal fistula)
- MRI magnetic resonance imaging (anatomical pictures of the pelvic floor and urinary tract
- Cystourethroscopy (in cases of hematuria, persistent UTI, reduced bladder capacity)
- Urethral pressure profilometry

Treatment

- Exclusion of urinary tract infection
- Restriction of fluid intake special on afternoon
- Modifying medication e.g. diuretics
- Treat chronic cough and constipation
- Pelvic floor exercises can improve symptom 40%
- Physiotherapy is the conservative treatment of stress incontinence
- HRT in postmenopause women
- Electrical stimulation
Conservative management

- Pelvic floor muscle training should be offered to women in their first pregnancy as a preventive strategy for UI.
- There is evidence that pelvic floor muscle training used during a first pregnancy reduces the likelihood of postnatal UI.
- Intravaginal devices are not recommended for the routine management of UI in women, for example during physical exercise.
- Lifestyle interventions
  - Coffein
  - Daily fluid
  - BMI

Physical therapies

- Trial program for 3 months
- 8 contraction for 3-4 times
- Continous program

Behavioural therapies

- Bladder training
- Pt with resiual urin can learn double or triple voiding
- Timed voiding toileting programmes are recommended as strategies for reducing leakage episodes.

Sacral neuromodulation

Vaginal device

Medical management

- An anticholinergic agent is a substance that blocks the neurotransmitter acetylcholine in the central and the peripheral nervous system.
- The nerve fibers of the parasympathetic system are responsible for the involuntary movements of smooth muscles present in the GIT, urinary tract, lungs, etc.
- Anticholinergics are divided into three categories in accordance with their specific targets in the central and/or peripheral nervous system: antimuscarinic agents, ganglionic blockers, and neuromuscular blockers.

Procedures for stress UI

- The tension-free transvaginal (TVT) sling (86-95%)
- The transobturator tape (TOT) sling (82%)
- The mini-sling procedure also known as TVT-Secure (67-83%)
- Open colposuspension
  - Marshall-Marchetti-Krantz(retropubic suspension or bladder neck suspension surgery)
  - Burch
- Periurethral bulking agents

TVT

TOT

Colposuspension

Periurethral bulking