Renal system

Acute glomerulonephritis (Nephritic syndrome)

Diagnostic tool

1. Patient complaint-swelling of face, leg & eyelid, oliguria, haematuria, fever may be present.

2. History of skin lesion or sore throat 1-4 weeks before may be present.

3. On examination-puffy face, blood pressure-high, leg edema present, bed side urine examination-proteinuria.

4. Investigation-urine R/M/E-proteinuria (mild to moderate), hematuria, cellular (RBC, WBC) casts present.

Management

Treatment is supportive, with control of hypertension, edema, and dialysis as needed. Antibiotic treatment for streptococcal infection should be given to all patients and their co-habitants in poststreptococcal AGN.

1. Diet - normal, protein, salt, fruit, fluid restricted.

2. Cefuroxime 250 mg BD for 7 days; (in post streptococcal GN then phenoxymethyl penicillin 250 mg 6 hourly for 7 days).

3. Frusemide (40 mg) to reduce edema.

4. Ramipril 1.25 mg to 2.5 mg to control hypertension.

5. Maintain input output chart.

N.B:

* The inflammatory glomerular injury may require corticosteroids and cytotoxic agents.

* Postinfectious glomerulonephritis- corticosteroids have not been shown to improve outcome.

Nephrotic syndrome

Diagnostic tool

1. Patient complaint-generalized edema, starting from face, frothy urine (due to proteinuria).

2. On examination-puffy face, leg edema present, blood pressure usually normal.

3. Investigation-urine R/M/E-proteinuria, 24 hours total urinary protein > 3.5 gm (massive proteinuria), lipid profile- hypercholesterolemia, serum albumin-low.

Management

1. Diet - Normal, protein, salt, fruit, fluid restricted.

2. Antibiotic if UTI present (before that do urine C/S).

3. Frusemide preferably IV to reduce edema.

4. Ramipril to reduce proteinuria.

5. Prednisolone, 1 mg/kg/day orally for 6 weeks then gradually tapper off

6. Atrovastatin if hypercholesterolemia

7. Maintain input output chart

8. Treatment of the underlying cause like DM, SLE etc.

Tips: Patients with frequent relapses and corticosteroid resistance may need cyclophosphamide or chlorambucil to induce subsequent remissions.

Acute pyelonephritis

Diagnostic tool

1. Patient complaint-high fever with chills & rigor, loin pain, dysuria, frequency of micturition.

2. On examination - temperature high, renal angle tenderness may be present.

3. Investigation-urine R/M/E-pus cell >5/HPF, CBC-neutrophillic leucocytosis present, USG of whole abdomen-both kidneys may be swollen.

4. Urine C/S-must be sent to identify the offending organism and antibiotic sensitivity pattern.

Management

1. Antibiotic is the mainstay of treatment

First choice-ciprofloxacin 500 mg twice daily for 7 days or cefalexin 1 g 4 times daily for 14 days, admission to hospital if no response within 24 hours.

Second choice-cefuroxime 750–1500 mg 3 times daily or gentamicin for 14 days.

Antibiotic should be changed according to urine C/S report.

2. Paracetamol to control temperature.

Urinary tract infection (UTI) (acute urethritis and cystitis)

Diagnostic tools

1. Patient complaint- dysuria, loin pain, haematuria, frequency of micturition, foul smelling urine, cloudy urine, lower abdominal pain etc.

2. On examination - renal angle and lower abdominal tenderness may be present.

3. Investigation-urine R/M/E-pus cell >5/HPF.

4. Urine C/S-must be sent to identify the offending organism and antibiotic sensitivity pattern.

Management

Antibiotic duration- 3 days in women (during pregnancy 7 days), 7-10 days in men.

1. Antibiotic is the mainstay of treatment

First choice-nitrofurantoin 100 mg twice daily or trimethoprim 200 mg twice daily.

Second choice-ciprofloxacin 250 mg twice daily.

In pregnancy-nitrofurantoin 100 mg twice daily.

Antibiotic should be changed according to urine C/S report.

Intravenous antibiotic should be given in following conditions:

i) Complicated UTI (UTI with renal impairment, immunocompromised condition like DM, cancer patient, getting cytotoxic drugs etc).

ii) UTI with high fever with poor general condition.

2. Following advice should be given

Dc‡`k

1| cÖwZw`b Kgc‡¶ 2 wjUvi cvwb Lv‡eb|

2| cÖmªv‡ei Pvc Avm‡jB cÖmªve Ki‡eb| cÖmªv‡ei Pvc a‡i ivL‡eb bv|

3| cÖmªv‡ei ci cwi¯‹vi cvwb e¨envi Ki‡eb|

4| mnev‡mi c~‡e© I c‡i cÖmªve Ki‡eb|

5| gvwm‡Ki mgq cwi®‹vi Kvco ci‡eb|

Persistent or recurrent UTI

If the causative organism persists on repeat culture despite treatment, or if there is reinfection with any organism after an interval, then an underlying cause is more likely to be present and more detailed investigation is justified. In women, recurrent infections are common and investigation is justified only if infections are frequent (three or more per year) or unusually severe.

Management

1. Main management is to treat the underlying condition like treatment of genital prolapse, BPH etc.

2. If an underlying cause cannot be treated then prophylactic antibiotic should prescribe.

First choice- Trimethoprim 100 mg at night

Second choice- Nitrofurantoin 50 mg at night.

Acute kidney injury (AKI)

Diagnostic tools

1. Patient complaint-history of vomiting or diarrhoea or massive blood loss followed by oliguria or anuria, vomiting, hiccough.

2. On examination-dehydration usually present, blood pressure low, pulse rapid thready.

3. Investigation-s. creatinine raised. S. electrolytes-to see serum potassium, blood and urine C/S should be sent (as septicaemia is common).

Management

1. Diet-protein, salt, fruit restricted.

2. Fluid restricted- fluid intake should be the equal amount of previous day output.

3. Infusion normal saline if patient dehydrated (cholera saline should be avoided because it contains k+, which may cause hyperkalaemia and cardiac arrest).

Follow up

1. Pulse

2. BP

3. Hydration status

4. Urine out put

5. S. creatinine

6. Serum electrolytes.

Indication of renal replacement therapy (dialysis or transplantation) in acute kidney injury

1. Hyperkalaemia K+ >6.5 mmol/L.

2. Fluid overload & pulmonary edema.

3. Metabolic acidosis.

4. Increased plasma urea and creatinine (urea > 180 mg/dl & creatinine >6.8 mg/dl).

5. Uraemic pericarditis/ uraemic encephalopathy.

Chronic renal failure

Diagnostic tools

1. History of hypertension or diabetes or glomerular disease, or other systemic disease (SLE).

2. Patient complaint of anorexia, vomiting, generalized weakness.

3. On examination-anaemia present, blood pressure usually raised.

4. Investigation-s. creatinine raised, USG of whole abdomen-bilateral small kidney.

Management

1. Diet-protein, salt & fruit restricted (protein 60 gm daily).

2. Tab. Calcium carbonate (500mg) 1+0+1 continued.

3. Cap. Cholicalciferol (0.25 µgm) 0+1+0 continued.

4. Tab. Ferrous sulphate 1+0+1 (if patient is anaemic).

5. Treatment of the underlying cause like hypertension, DM etc.

6. If anemia persists after iron therapy then

Inj. Epoietin (25-50 IU/kg body weight once or twice in a week).

Antihypertensive used in CRF

1. First choice- ACEI, ARB, non-dihydropyridines CCB (amlodipin)

2. Alpha receptor blocker

3. Betablocker (Atenolol)

N: B: 1-2 week after giving ACEi or ARB if s.creatinine increased 25 % than previous record then stop ACEi or ARB).

Indication of dialysis in CRF (WHO criteria)

1. Uraemic pericarditis.

2. Uraemic encephalopathy or neuropathy.

3. Pulmonary edema unresponsive to diuretics.

4. Severe hypertension if not control by medical management.

5. Severe hyperkalaemia not control by medical management.

6. Severe bleeding diathesis.

7. S. Creatinine > 12 mg/dl or BUN > 100mg/dl.

Dc‡`k

1) Wv³v‡ii civgk© Qvov †cÖmv‡ii Ilya eÜ Ki‡eb bv |

2) aygcvb/ZvgvK/R`©v/¸j e¨envi Ki‡eb bv |

3) Avwgl RvZxq Lvevi †hgb gvQ, gvsm, wWg, `ya 60 MÖvg Gi †ewk Lv‡eb bv|

4) Pwe© RvZxq Lvevi †hgb- Miæi gvsm, Lvwki gvsm, wPsox gvQ, `y‡ai mi Kg Lv‡eb|

5) cÖwZw`b 30 wgwbU nvU‡eb| IRb Kgv‡eb|

6) cÖPzi cwigv‡b kvK-meRx Lv‡eb|

7) cv‡Z jeb Lv‡eb bv|

8) gvbwmK Pvc cwinvi Ki‡eb|

9) †cÖmvi 130/80 Gi Kg _vK‡j eyS‡eb Avcbvi †cÖmvi wbqš¿‡Y Av‡Q|

10) †cÖmvi wbqš¿‡Y bv _vK‡j nvU© A¨vUvK, wKWbx †dBji, †ó ªvK, AÜZ¡ mn Av‡iv A‡bK RwUj mgm¨v n‡Z cv‡i|

Tips:

Ccr (creatinine clearance) can be estimated from the Cockcroft and Gault equation-

Ccr = (140- age) × body weight/72 × S. creatinine (mg/dl)

For women, the creatinine clearance is multiplied by 0.85 because muscle mass is less.

Staging of CKD

Stages of CKD GFR (ml/min/1.73m2)

Stage 1 > 90 (with evidence of kidney damage)

Stage 260-89

Stage 330-59

Stage 415-29

Stage 5<15 or dialysis

N:B: Evidence of kidney damage means pathological abnormalities or marker of damage, including abnormalities in urine tests or imaging studies. Two GFR values 3 months apart are required to assign stage.

Urinary incontinence

Urinary incontinence is defined as any involuntary leakage of urine. Childbirth, hysterectomy, obesity, recurrent UTI, dementia or poor mobility, an acute illness or hospitalization, especially in older people, smoking, caffeine and constipation are risk factors for incontinence. Management depends on type of incontinence. Sometimes cystometrography to see urine flow rates and full urodynamic assessment to classify types of incontinence (for selected patients).

Stress incontinence

This occurs because passive bladder pressure exceeds the urethral pressure, due either to poor pelvic floor support or a weak urethral sphincter. Stress incontinence is very common in women and seen most frequently following childbirth.

Diagnostic tools

1. Symptom-patient complains of incontinence during coughing, sneezing or exertion.

2. On examination- in women, perineal inspection may reveal leakage of urine when the patient coughs.

3. Investigation-diagnosis is clinical. Urine R/E & C/S, USG to exclude other causes.

Management of stress incontinence

1. Weight reduction if obese.

2. Pelvic floor muscle exercise (see below).

3. There are no approved medications to specifically treat stress incontinence. The antidepressant duloxetine can be used. Dose is 80 mg/day, should be started at low dose 20 mg BD then increase dose according to the response.

Urge incontinence

This usually occurs because of detrusor over-activity, which produces an increased bladder pressure that overcomes the urethral sphincter. The incidence of urge incontinence increases with age. Urge incontinence usually resulting from UTI, DM, spina bifida or multiple sclerosis.

Diagnostic tools

1. Symptoms- sudden, intense urge to urinate followed by an involuntary loss of urine.

2. Examination- neurological and lumbar spine examination is needed. Perineal sensation and anal sphincter tone should be assessed.

3. Investigation- Urine R/E & C/S, blood glucose, USG. Others according to the history and clinical examination findings.

Management

1. Weight reduction if obese.

2. Pelvic floor muscle exercise (see below).

3. Anticholinergic drug like tolterodine (start 1 mg/day then gradually increase according to response up to 2 mg 2 times daily), solifenacin (start 5 mg/day then gradually increase according to response up to 10 mg/day) can be helpful. Mirabegron is a new drug to treat stress incontinence.

Overflow incontinence

This occurs when the bladder becomes chronically over-distended. It is most commonly seen in men with benign prostatic enlargement.

Diagnostic tools

1. Symptoms- patient complains of incontinence of urine without any urge of micturition. This may happen during the day or even wetting the bed at night.

2. Examination- Rectal examination is needed to assess the prostate in men and to exclude faecal impaction as a cause of incontinence

3. Investigation- Urine R/E & C/S, USG.

Management

1. Alpha blockers (tamsulosin, alfuzocin, terazosin) is helpful. In men with overflow incontinence, these medications relax bladder neck muscles and muscle fibers in the prostate and make it easier to empty the bladder.

2. Surgery- if not responding to drugs.

Continual incontinence

This is suggestive of a fistula, usually between the bladder and vagina (vesicovaginal), or the ureter and vagina (ureterovaginal). Prolonged obstructed labour is common cause of vesicovaginal fistulae. Also may be following gynaecological surgery, patients with gynaecological malignancy or post radiotherapy.

Genital examination should be done to identify phimosis or paraphimosis in men, and vaginal mucosal atrophy, cystoceles or rectoceles in women. Uusually treatment is surgical.

Pelvic floor muscle exercises (Kegel exercises)-improves both stress and urge incontinence.

1. Find the right muscles. To identify pelvic floor muscles, stop urination in midstream. Watch carefully which muscles is require to do this. Exercise of those muscle should be done.

2. Perfect your technique. Tighten (contract) the muscles use to stop urinating and hold for five seconds, and then relax for five seconds.

3. Maintain your focus. Work up to holding the contractions for 10 seconds at a time.

4. Repeat three times a day-do this 3 times/day (10 to 15 repetitions each time).