

Paediatric renal problems

5th year lecture

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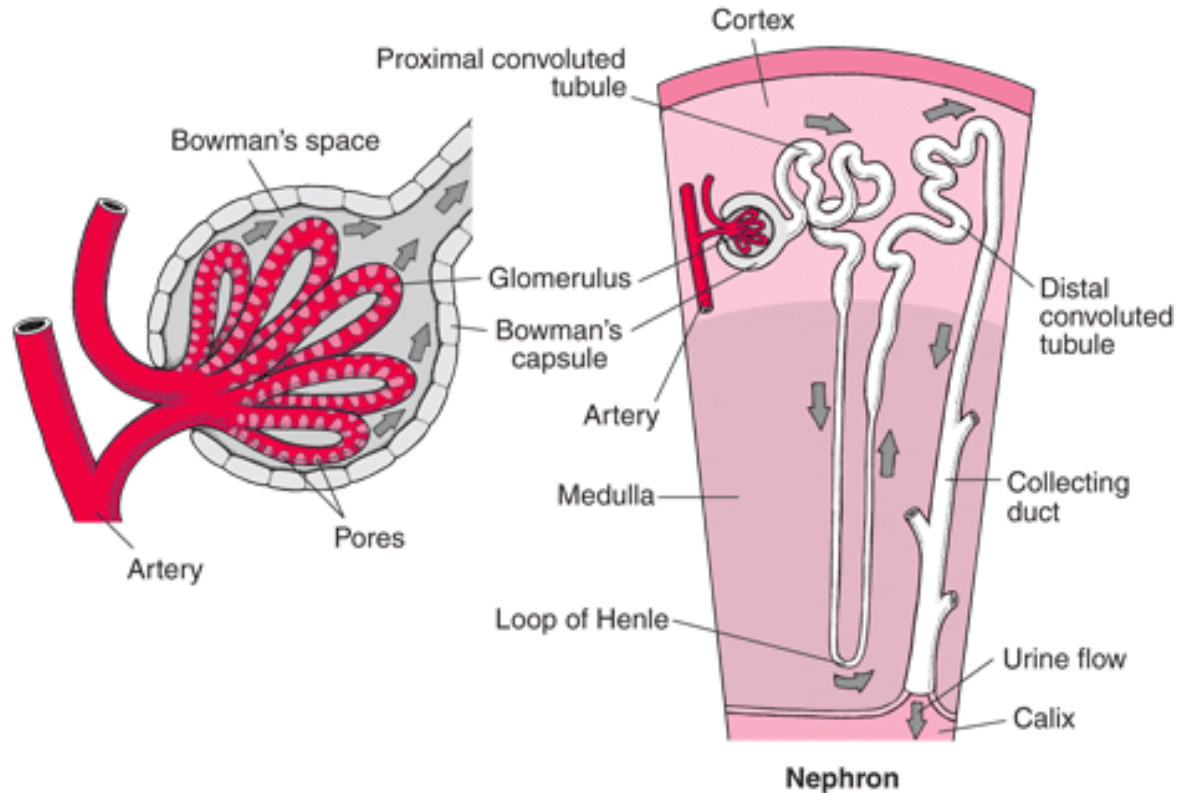
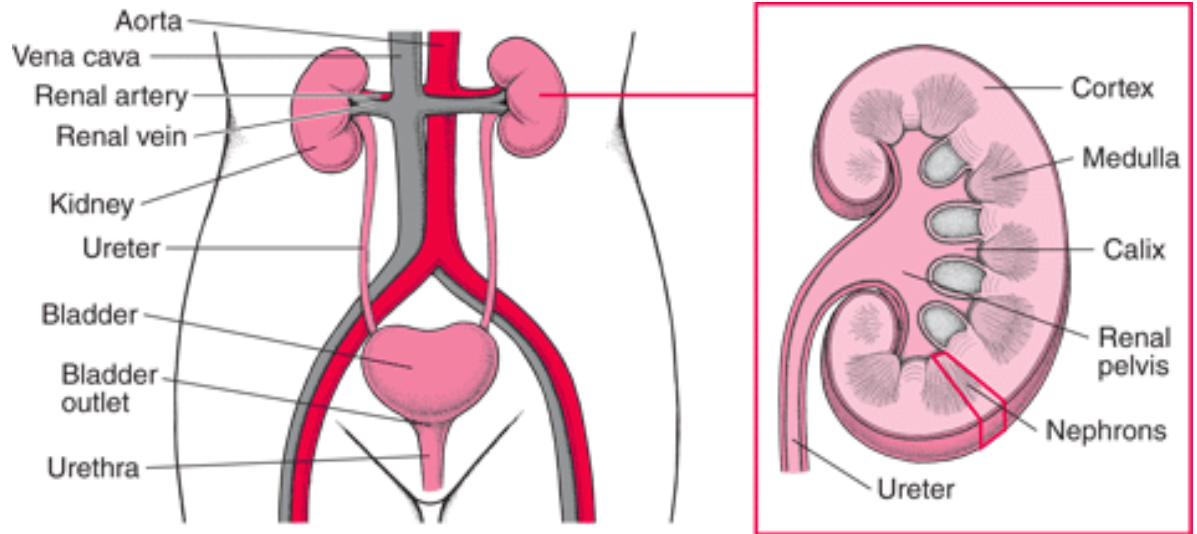
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Learning objectives

By the end of the lecture you should understand the pathogenesis, presentation, investigation and management of:

- Nephrotic syndrome
- Nephritic syndrome
- Haemolytic Uraemic Syndrome
- Acute renal failure

What do kidneys do?



Nephrotic syndrome

- Proteinuria
- Oedema
- Low plasma albumin

- Cause often unknown
- May be secondary to
 - HSP, other vasculitides eg. SLE, malaria, allergens

Nephrotic syndrome

Clinical signs

- Periorbital oedema
- Oedema of lower limbs and genitalia
- Ascites
- Breathlessness
 - Pleural effusions

Differential diagnoses?



Nephrotic syndrome

Investigations

- Urine protein
 - Dipstick
 - 24 hour collection
 - Early morning urine protein/creatinine ratio
- FBC, ESR
- Urea, creatinine, electrolytes, albumin
- Urinary sodium concentration
- BP



Steroid-sensitive nephrotic syndrome

- 85-90% cases
- Ages 1- 10 years
- No macroscopic haematuria
- Normal BP
- Normal renal function

Treatment

- Oral prednisolone 60mg/m² per day for 4/52
- Then 40mg/m² on alternate days for 4/52
- Then stop

- May be better outcome if extended to 6 month course by tapering the alternate day regime

Side effects of steroids?

Complications

- Hypovolaemia
 - Loss of fluid from intravascular compartment
- Thrombosis
 - Multifactorial
- Infection
 - Capsulated bacteria eg. *Pneumococcus*
 - Prophylactic Penicillin until in remission
- Hypercholesterolaemia

Prognosis

- 1/3 resolve
- 1/3 relapse infrequently
- 1/3 relapse frequently = steroid dependent

“Relapse”

2+ or more on urine dipstick on 3 consecutive days

“Steroid dependent”

2 consecutive relapses on steroid treatment or within 14 days of stopping steroids

Acute nephritis

- Restricted glomerular blood flow → decreased filtration
 - Decreased urine output and volume overload
 - Hypertension
 - Oedema, usually periorbital
 - Haematuria and proteinuria



Acute nephritis

Causes

- Post infectious – streptococcal
- Vasculitis – HSP
- Ig A nephropathy
- Familial
 - Alport's syndrome X-linked recessive

Acute nephritis

- Investigations
 - Urinalysis: blood, protein, red cell casts
 - Renal function and electrolytes
 - ASOT, anti DNase B
 - Autoimmune profile, complement levels
- Management
 - Fluid and electrolyte balance
 - Diuretics
 - Close monitoring of renal function

Acute renal failure

- Sudden potentially reversible reduction in renal function
- Increased creatinine and urea
- Oliguria
 - $<0.5\text{ml/kg/hr}$
- Pre-renal
- Renal
- Post renal

Acute renal failure

Pre renal	Renal	Post renal
<p>Hypovolaemia</p> <ul style="list-style-type: none"> GE Sepsis Burns Bleeding Nephrotic syndrome <p>Circulatory failure</p>	<p>Vascular</p> <ul style="list-style-type: none"> HUS Vasculitis Embolus Renal vein thrombosis <p>Tubular</p> <ul style="list-style-type: none"> Acute tubular necrosis Ischaemia Toxins <p>Glomerular</p> <ul style="list-style-type: none"> Glomerulonephritis <p>Interstitial</p>	<p>Obstruction</p> <ul style="list-style-type: none"> Congenital Acquired

Acute renal failure

- Investigations
 - Urine dipstick and microscopy, urine Na
 - Electrolytes, urea, creatinine, bone profile
 - FBC and film
 - Renal tract USS
- Management
 - Treatment of fluid and electrolyte imbalance
 - Challenge with 10-20ml/kg NaCl
 - Frusemide only if volume replete – 2mg/kg IV
 - Treatment of hypertension
 - Dialysis

Haemolytic Uraemic Syndrome

- Microangiopathic haemolytic anaemia
- Thrombocytopenia
- Acute renal failure

- Typical, diarrhoea associated
 - Enterohaemorrhagic E. Coli (O157:H7)
- Atypical, non-diarrhoeal
 - Pneumococcus, HIV

Haemolytic Uraemic Syndrome

- Prodrome → pallor → oliguria
- Oliguria up to 2/52 after onset of diarrhoea (typically d4-7)
- Fluid balance problems
- Hypertension

- Treatment is supportive
 - Fluid balance, blood transfusion, platelets if active bleeding
 - Dialysis needed in >50%
- No Abx for EHEC

Reading

Illustrated textbook of Paediatrics

Lissauer and Clayden

p317-325