

## Haematuria

### Differential diagnosis of red urine (it does not always need to be blood)

- Haematuria
  - Red blood cells in urine (macroscopic or microscopic)
- Haemoglobinuria
  - From haemolysis. Classical red urine.
  - Positive urine dipstick
  - When urine spun in centrifuge the entire fluid will remain red – whereas whole red blood cells in urine will form a supernatant – ask the lab to spin when unsure!
- Myoglobinuria
  - From muscle breakdown
  - Measure CK
  - When urine spun in centrifuge the entire fluid will remain red
- Bilirubinuria
  - In obstructive jaundice
  - Does not occur in haemolysis as this produced non-soluble unconjugated bilirubinaemia which is not soluble
- Other
  - Beetroot
  - Rifampicin, nitrofurantoin, senna all change urine color
  - Porphyria

### Types of haematuria

- Two types
  - Macroscopic (visible)
  - Microscopic (non-visible)
- There has been a shift towards using “visible” and “non-visible” haematuria although they mean the same thing
- Macroscopic patients will tell you about it! They generally present earlier – this always needs investigation

### Causes of haematuria: From kidney to urethral tip

- **Kidney/Glomerular:**
  - Glomerular
    - Thin basement membrane (TBM) in children – persistent microscopic haematuria
    - IgA nephropathy – transient macroscopic haematuria sometimes followed by persistent macroscopic haematuria
    - Alport’s syndrome – like TBM but associated with deafness, X-lined dominant in 85%, defect in IV collagen of basement membrane
    - Glomerulonephritis
  - Non-glomerular
    - Tumours (RCC, Wilm’s in children)
    - Nephrolithiasis
    - Infection – including renal TB
    - Polycystic kidneys
    - Trauma – take haematuria post trauma seriously!
    - Urethral stricture
    - Renal infarction/AVM/renal vein thrombosis
    - Sickle cell

- Drugs
  - NSAIDs, anticoagulants

- **Ureters**

- Stones
- Tumours
- Strictures
- Urethritis

- **Bladder**

- Stones
- Tumours – Transitional cell and squamous cell
- Infections
- Cyclophosphamide (haemorrhagic cystitis)
  - Need to heavily hydrate and give MESNA
- Benign polyps
- Schistosoma haematobium

- **Urethral**

- Benign prostatic hypertrophy
- Prostatitis
- Urethritis – take a sexual health history
- Trauma

- **Transient or unknown source**

- Exercise induced
- Menstruation
- Post-coital
- Over-anticoagulation (though still search for source in this case)
- Functional
- Non-specific viral illness

### History in haematuria

- Presenting complaint
  - How often, how much for how long?
  - Only associated with voiding? When in the stream?
  - Associated pain? Loin to groin? Suprapubic?
- Associated symptoms
  - Any obvious masses?
  - Trauma?
  - Previous occurrences?
  - Systemic symptoms or “B type” symptoms: weight loss, fevers, night sweats
  - History of anticoagulation?
  - Recent infections (glomerulonephritis)?
  - Recent travel (Lake Malawi - schistosoma)?
  - Recent instrumentation?
- Past medical history
  - Stone disease, cancer, recent anticoagulation, hypertension, diabetes
- Drugs history
  - Anticoagulants/anti-platelets, recent chemotherapy
- Social history
  - Risk factors for urological malignancy: Smoking, aniline dyes (fumes and chemicals), radiotherapy, immunosuppression, schistosoma
- Family history

- Deafness (Alport's), general renal disease, TB contacts

### Examination in haematuria

- Haemodynamic status: adopt an ABCDE approach if patient unwell
- Examine for signs of anaemia: pallor (including conjunctiva)
- Obvious bruising or bleeding
- Evidence of pharyngitis (GN)
- Systemic signs
  - Arthralgia, lymphadenopathy, purpuric rashes
- Signs of endocarditis
- Oedema
- Hypertension
- Abdominal masses
  - Tumours and polycystic kidneys
- Abdominal pain
- Abdominal bruits if AVM suspected
- Rectal examination for prostate

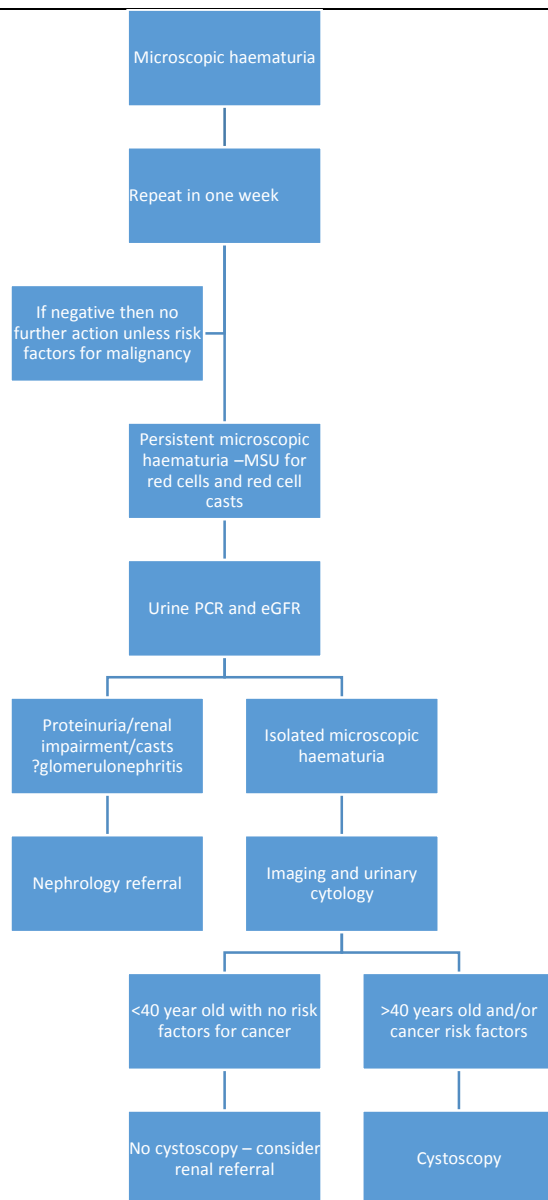
### Investigations in haematuria

- Urine
  - Urine dip
    - Even if negative but patient reports macroscopic urine take it seriously
  - MC and S
    - Consider sending for ova if Schistosoma is suspected, red cell casts insinuate glomerular disease
  - Urine cytology
- Bloods
  - U+Es, creatinine (?renal damage)
  - FBC (?chronic disease, ?renal impairment), clotting, G+S
  - Consider a PSA and haemoglobin electrophoresis
- Imaging
  - Renal tract USS and/or CT
    - CT pre and post contrast is preferable
- Cystoscopy
  - Cystoscopy is nearly always warranted: imaging does not allow for true luminal visualisation (as well as need for biopsies or ability to give treatment locally)
- Renal biopsy
  - If glomerulonephritis suspected

### Management of haematuria

- Depends on cause
- Urgent referral for:
  - Anyone with macroscopic haematuria
  - Anyone over 50 with persistent microscopic haematuria

### Management algorithm for microscopic haematuria



- Glomerular lesions are more likely if: proteinuria, red cells casts, renal impairment of hypertension.
- If microscopic haematuria remains unexplained then as long as patient's symptoms remain stable an annual review with a urine dip, blood pressure check and U&Es is reasonable (can be done by GP)
- Some patients depending on risk will require annual cystoscopy

### Questions on haematuria

- Name two causes of asymptomatic glomerular haematuria?
  - Answer: IgA nephropathy and thin basement disease
- How is Alport's inherited?
  - Predominantly X-linked dominant