

Canadian **U**rological Association  
The Voice of Urology in *Canada*



Association des **U**rologues du Canada  
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# Management of Microscopic Hematuria

**Alan So MD, FRCSC**

*Senior Research Scientist*

*Vancouver Prostate Centre*

*Associate Professor*

*Department of Urologic Sciences*

*University of British Columbia*

# Disclosures

- Advisory Boards: Abbvie, Tersera, Ferring, Merck, Janssen, Amgen, Bayer



# Learning Objectives

- By participating in this educational program, health care providers can expect to:
  - 1. Define hematuria
  - 2. Describe the differential diagnoses of hematuria
  - 3. Review the appropriate investigation and management of hematuria
  - 4. Determine when to refer a patient with hematuria to a urologist



# Definitions

- Microscopic hematuria is defined as the presence of 3 or more red blood cells ( $\geq 3$  RBC) per high power field (hpf) on a urine microscopy evaluation
- Positive dipstick may indicate hemoglobinuria, hematuria, or both and requires confirmation on urine microscopy investigation.
- Hematuria is often classified as visible or non-visible hematuria (gross or macroscopic hematuria vs microscopic) and symptomatic vs asymptomatic



# Risk Factors for Bladder Cancer

- History of smoking is the strongest risk factor
- Other risk factors include:
  - Occupational exposure to chemicals or dyes (e.g. benzenes or aromatic amines)
  - Exposure to certain drugs (phenacetin, cyclophosphamide)
  - Exposure to pelvic radiation
  - Specific occupations at risk: tobacco workers, dye & textile workers, chimney sweeps, rubber workers, waiters, metal workers, firemen/women, painters, printers, seafarers



# Assess symptoms and risk factors with a good history

- 1. Localizing signs or symptoms:
  - Flank/abdominal pain to suggest colic
  - Lower urinary tract symptoms such as:
    - dysuria to suggest UTI
    - frequency to suggest carcinoma-in-situ
- 2. Systemic symptoms
  - Signs of infection: fever, chills, back pain
  - Signs of coagulopathy: epistaxis, etc.
- 3. Assess for risk factors:
  - Smoking history
  - Occupational history
  - Medical history (exposure to chemotherapies, radiation)

# Rule out other non-urologic etiologies

- 1. Rule out infection (WBCs, nitrates, positive urine culture)
- 2. Assess for isolated hemoglobinuria (positive dip but negative microscopic urinalysis) that may suggest hematologic problems such as paroxysmal nocturnal hemaglobinuria (PNH) that may require expedited referral to hematology



# Rule-out non-urologic entities

- 3. Assess for renal causes (dysmorphic RBCs, proteinuria, cellular casts, renal insufficiency or any suspicion of renal parenchymal disease) that may warrant nephrologic workup.
- 4. Clinicians should perform the same evaluation of patients with microhematuria who are taking DOACs or **other** anticoagulants (regardless of the type or level of therapy) as patients not on these agents. Do not assume hematuria is due to anticoagulation





# Initial Evaluation

- 1. Microscopic evaluation to confirm positive dip test
  - Confirm presence of RBCs (3 or more /HPF)
  - Assess for isolated hemoglobinuria that may prompt hematologic referral
- 2. Urine cytology and urinary markers are poor screening tests and are **not recommended** in the initial workup
- 3. Measure Serum creatinine, Urine albumin-to-creatinine ratio (ACR) and blood pressure
  - Proteinuria, dysmorphic RBCs, casts, abnormal ACR, reduced GFR, new onset hypertension suggests renal parenchymal disease and nephrology referral



# Indications for Urology Referral

- SINGLE episode of **visible** hematuria (any age)
- SINGLE episode of **symptomatic** hematuria not associated with infection
- SINGLE episode of isolated microscopic hematuria (3 or more RBCs/ HPF) **aged  $\geq$  40 years**
- Microscopic hematuria and aged  $<$  40 years AND perceived high risk factors, including:
  - Current or past tobacco use
  - History of pelvic irradiation
  - Cyclophosphamide or other carcinogenic alkylating agent exposure
  - Exposure to occupational hazards such as dyes, benzenes, and aromatic amines



# Urologic Assessment

- Lower tract assessed by cystoscopy
- There is limited evidence to strongly recommend one modality.
  - A. Ultrasound, CT, MRI, retrograde pyelogram are acceptable
  - B. Taking patient safety (ionizing radiation and exposure to i.v. contrast), availability, and cost into consideration, it is recommended that ultrasound be used as the imaging test of first choice for asymptomatic microhematuria
- In those with visible hematuria and/or strong risk factors, CT-Urography or MR-Urography are better to assess for upper tract urothelial abnormalities



# Follow up:

- No cause will be found for microscopic hematuria in many cases.
- When no specific cause for persistent microscopic hematuria is found, the patient should be followed annually with:
  - Urine microscopy
  - Creatinine/eGFR
  - Blood pressure
  - Urine cytology (only in patients with risk factors for urothelial cancer)

# Follow-up

- If patients develop visible hematuria, new urinary symptoms, or increasing degree of microscopic hematuria, proteinuria, or declining renal function, re-investigation should be undertaken.
- If, after initial investigation, the degree of microscopic hematuria persists unchanged on annual follow-up, repeat investigation within 3-5 years should be considered.
- If three consecutive annual urine microscopies are negative, follow-up testing can be discontinued.



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