

# Overview of Etiology and Roles of Family Physicians in Diagnosis of Hematuria

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**Abstract:** This article provides an overview of the many areas of this disease and provides guidelines for evaluating hematuria for primary care providers. We discuss the common etiologies, diagnosis and highlight the management. We conducted search through databases; PubMed, and Embase for articles published to October, 2017. Blood in urine - recognized clinically as hematuria. The majority of the disorders that might trigger hematuria are "nonsurgical, non-uological" illness and need to be managed by a general physician. Usually blood in the urine is not life-threatening, nevertheless, it should not be neglected. All situations of hematuria need to be assessed by a physician that could order examinations to verify or eliminate the cause. There is no particular therapy for hematuria, since it's symptom are not certain. That's why, therapy should be focused on the underlying reason.

**Keywords:** hematuria, red blood cells (RBCs), primary care providers.

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## 1. INTRODUCTION

Hematuria is defined as the presence of an abnormal quantity of red blood cells (RBCs) in the urine. Hematuria is among one of the most usual searching's for on urinalysis in patients experienced by primary care doctors, with an occurrence of 4 for every 1000 patients each year[1]; 1 it stands for concerning 6% of brand-new patients seen by urologists.2 The resource of hematuria can be anywhere along the urinary system as well as could be the very first discussion of a major problem consisting of hatred. In numerous situations it can, in addition, be the first conversation of a considerable urological difficulty. Medically, it can be categorized as either gross or tiny hematuria.

Hematuria is a difficult issue with a large range of factors along with treatments. It can be a difficult situation when an or else nonurologic clinical patient has this issue. Gross hematuria is specified as pee that is noticeably discoloured by blood [2]. It might accompany as low as 1 mL of blood in 1 L of pee. Since the patients could identify the unusual shade of the pee, they normally offer to their medical professional not long after the episode. Gross hematuria should be set apart from various other reasons for discolored urine. Descriptions of microscopic hematuria differ, varying from 1 to greater than 10 RBCs for each high-power area (400 magnification ) [3].For that reason, making a precise referral for the assessment of microscopic hematuria based upon previous researches is difficult.

This article provides an overview of the many areas of this disease and provides guidelines for evaluating hematuria for primary care providers. We discuss the common etiologies, diagnosis and highlight the management.

## 2. METHODOLOGY

We conducted search through databases; PubMed, and Embase for articles published to October, 2017. All studies concerned the hematuria etiology and management in primary care. More studies were identified through searching the references list of included studies.

### 3. DISCUSSION

- **Etiology of Hematuria:**

Pain-free hematuria in grownups is normally associated (in greater than 90% of instances) to a malignant procedure of the urinary system, while hematuria in kids, which is not unusual (5 – 30% of asymptomatic kids [4], belongs to a large range of problems primarily unrelated to malignancy. A few of erythrocytes could be located in typical urine, however greater than 3 to 5 erythrocytes each high-power area on a microscopic assessment is normally taken into consideration irregular. Hematuria is an usual grown-up issue. In a current population-based research study, 13 % of grownups had asymptomatic hematuria. There is a basic understanding that hematuria is a major trouble which possibly lifethreatening reasons should be strongly eliminated.

- **Causes of Hematuria:**

Numerous researches have actually analyzed the reasons for hematuria as well as have actually located that differences in between gross as well as microscopic hematuria, or in between hematuria existing on one or numerous evaluations, could not be relied upon to anticipate a benign procedure. As a result, medical professionals have to think about the opportunity that also a single episode of asymptomatic microscopic hematuria could show a significant condition. The reasons for certain hematuria differs extensively in presently reported research studies, as (Table 1) shows.

**Table.1 Common Causes of Hematuria[5].**

Glomerular	Renal (nonglomerular)	Postrenal	Hematologic	False
IgA nephropathy	Renal infarct	Nephrolithiasis	Coagulopathy	Vaginal bleeding
Other glomerulonephritis	Renal vein thrombosis	Tumors of lower urinary tract	Anticoagulation	Fictitious
Alport's syndrome	Tuberculosis	Cystitis-infection, drug-related, radiation, idiopathic	Sickle cell anemia and trait	Pigmentura-porphyrin, hemoglobinuria, myoglobinuria, food, drugs
Benign familial hematuria	Pyelonephritis	Prostatitis		
Strenuous exercise	Polycystic disease	Foreign bodies of bladder or urethra		
	Medullary sponge kidney	Urethritis		
	Interstitial nephritis-drug-related, infection, and the like	Benign prostatic hypertrophy		
	Trauma	Obstruction		
	Papillary necrosis			
	Neoplasm			

**Glomerular:**

One of the most usual reason for glomerular bleeding is glomerulonephritis. Acute glomerulonephritis, either primary or secondary to a systemic illness, is typically defined by the unexpected look of hematuria, proteinuria, and also erythrocyte casts [6], [8].The connected signs and symptoms, as well as chosen serologic searchings for frequently, assist set apart amongst the different reasons for secondary glomerulonephritis, yet a kidney biopsy could be needed to set apart amongst the primary kinds of the condition. Primary glomerulonephritis could additionally offer with just separated hematuria without proteinuria or casts. Numerous patients with this problem have actually been identified as having "benign primary hematuria" in the past when substantial analyses were unrevealing and also the lasting diagnosis seemed excellent.

The medical symptoms of supposed IgA nephropathy variety from asymptomatic hematuria adhering to viral infections (Berger's illness) to systemic participation as seen in Schonlein-Henoch purpura. Therapy is mainly supportive and the long-lasting treatment typically better, however some patients do call for treatment for modern hypertension or kidney insufficiency.

### **Renal (Nonglomerular):**

Nonglomerular kidney lesions that might trigger hematuria involve a range of problems such as pyelonephritis, kidney infarct, kidney vein thrombosis, interstitial nephritis, papillary necrosis, and also tumors [7]. Of all kidney tumors, 90 % are kidney cell cancer, the 2nd most typical malignant neoplasm of the urinary system. Kidney cell cancer happens mainly in older patients; just 4% of instances are discovered prior to age 40. About 60% of these instances existing with hematuria, yet different systemic discussions consisting of hypertension, polycythemia, as well as fever, prevail. If these slow-growing tumours are found very early and also operatively eliminated prior to the tumor gets to the capsule, the five-year survival could be as high as 67%.

### **Postrenal:**

Hematuria typically arises from postrenal reasons such as nephrolithiasis, cystitis, prostatitis, and also reduced system neoplasms, specifically transitional cell cancer of the bladder (one of the most usual malignant condition of the urinary system). Regrettably, as numerous as 22% of cases of transitional cell cancer is not related to observable hematuria. Although benign prostatic hypertrophy could trigger hematuria, various other reasons have to be dismissed due to the fact that most of the patients will eventually have an additional reason for the hematuria [8].

### **Hematologic:**

Hematologic reasons for hematuria involve coagulopathies, too much anticoagulation, and also hemoglobinopathies. Restorative anticoagulation or antiplatelet treatment normally does not trigger hematuria, as well as underlying illness needs to be omitted. The sickle cell characteristic could trigger tiny or gross hematuria. The hematuria is normally pain-free as well as solves automatically, however the system is unidentified. The sickle cell attribute must likewise be taken into consideration in nonblacks too, as the trait is commonly dispersed amongst the populaces of southerly Europe, the Middle East, North Africa, and also India.

### **False Hematuria:**

False hematuria involves hemorrhaging from various other resources, such as the vaginal canal or exterior genitalia, and also pigmenturia. Pigmenturia prevails with particular foods, such as beets, as well as medications involving phenazopyridine, methyldopa, as well as rifampin [6]. Myoglobinuria as well as hemoglobinuria both trigger favourable urine dipstick examinations in the lack of erythrocytes on microscopic exam. Fictitious hematuria can be exceptionally difficult to identify and also is ideal eliminated by mindful catheterization.

#### **• Signs and symptoms [9]:**

- Fever, stomach pain, dysuria, regularity, and also current enuresis in older kids might indicate a urinary system infection as the reason
- Passage of clots in urine proposes an extraglomerular reason
- Recent throat or skin infection might recommend postinfectious glomerulonephritis
- Hematuria because of glomerular reasons is pain-free
- Joint discomforts, skin breakouts, as well as extended high temperature in adolescents recommend a collagen vascular problem
- Anemia could not be made up by hematuria alone; in a patient with hematuria and also pallor, various other problems ought to be thought about
- Skin rashes and also arthritis could happen in Henoch-Schönlein purpura and also systemic lupus erythematosus
- Recent injury to the abdominal area might be a sign of hydronephrosis
- Early-morning periorbital puffiness, weight gain, oliguria, dark-colored urine, as well as edema or hypertension recommend a glomerular reason
- Information concerning workout, menstrual cycle, current bladder catheterization, consumption of specific medicines or harmful compounds, or passage of a calculus might additionally aid in the differential medical diagnosis

- A family history that is suggestive of Alport syndrome, collagen vascular illness, urolithiasis, or polycystic kidney condition is necessary

• **Diagnostic algorithm:**

**Medical History:**

Info on injury is normally offered. It is essential to highlight that, in kids, also small injury could cause comprehensive genitourinary system damages. In grown-up patients, traditional signs and symptoms of urinary system or upper respiratory system health problem can be gotten [10]. Time in between beginning of signs to the look of hematuria could give a hint concerning the nature of the illness. Concomitant blood loss from various other body organs might show coagulation conditions; a family history of hemorrhaging problems, kidney, hearing, as well as sickle cell condition must be acquired.

**Physical Examination:**

Indications of candid or passing through injury ought to lie, when there is a background of injury. Genitalia must constantly be taken a look at as well as, in cases of injury, indicators of contusion, hematoma, or lacerations need to be recognized. Lesions of the genitalia without a clear background of injury must increase the uncertainty of kid misuse. When a genitourinary mass, such as rhabdomyosarcoma, belongs to the differential medical diagnosis, an anal exam needs to be done likewise. Evaluation of the abdominal area showing inflammation of the flank can cause the medical diagnosis of a urinary system infection or rock condition; stomach, retroperitoneal, as well as pelvic masses are reasonably simpler to palpate in little ones compared to in grownups as the stomach wall surface layers are much less created.

Physical exam must provide the following [10]:

- Measurement of the blood pressure (with a suitably sized cuff).
- Evaluation for the existence of periorbital puffiness or outer edema.
- Detailed skin assessment to search for purpura.
- Abdominal assessment to seek apparent kidneys.
- Careful assessment of the genitalia.
- Detailed ophthalmologic examination (in family hematuria).

The following lookings for assist compare glomerular as well as nonglomerular hematuria:

- Glomerular hematuria: Brown-colored urine, RBC casts, and also dysmorphic (tiny, deformed, misshapen, occasionally fragmented) RBCs as well as proteinuria.
- Nonglomerular hematuria: Reddish or pink urine, flow of blood clots, and also eumorphic (normal-sized, biconcavely designed) erythrocytes.

**Laboratory Tests:**

After recording that hematuria exists, a cautious look for various other urinary system irregularities is practical. The existence of proteinuria recommends a kidney parenchymal etiology and also must be measured by timed urine collection [12] Urine protein discharging of higher than 1 g/24 human resources is basically analysis of kidney parenchymal illness. Urine protein discharging of less than 1 g/24 human resources is not valuable in the differential medical diagnosis since it could schedule just to the existence of serum proteins that go along with the hematuria, or protein launched from red cells that have actually lysed.

White blood cells or white cell casts might come with red cells in contagious or noninfectious inflammation (e.g., acute interstitial nephritis or acute glomerulonephritis). Red cell casts are analysis of a kidney etiology of hematuria, generally glomerular in beginning. Crystals might be seen in patients with nephrolithiasis, however several kinds of crystals might additionally exist in the urine of patients without kidney stones.

Along with a total urinalysis [11], a complete blood count, serum electrolytes, blood urea nitrogen, as well as serum creatinine ought to be acquired. In patients with proof of infection, urine culture need to be acquired. If there is

uncertainty of a coagulation disruption, a prothrombin time, partial thromboplastin time, and also bleeding time ought to be examined. Black patients must be evaluated for the existence of sickle hemoglobin due to the high frequency of hematuria in patients with sickle characteristic. If there is a background of kidney colic, a kidney/ureter/bladder exam must be carried out to seek a kidney rock, adhered to by purgative urography if suitable. If there is a background symptomatic of hatred, cystoscopy needs to be done to review for bladder tumors; stomach computerized tomography or kidney arteriography ought to be done if kidney tumor is presumed.

If an evident resource is not evident after the preliminary analysis [14], after that excretory urography must be done. Cystoscopy must be done in patients with gross hematuria, searchings for symptomatic of a reduced system resource of blood loss and also in all older males. The effectiveness of regular cystoscopy for asymptomatic tiny hematuria in females and also males under the age of 40 has actually been wondered about as well as is most likely not called for on a regular basis. A skin test for tuberculosis ought to be put as well as, if favorable, first-voided early morning urine samplings for mycobacterial society must be gotten on 3 various events to dismiss genitourinary consumption. If all various other examination is nondiagnostic, or if there is proof of kidney parenchymal condition, nephrologic appointment needs to be gotten for factor to consider of percutaneous kidney biopsy.

• **Evaluation and Management:**

Injury patients ought to be handled in accordance with their hemodynamic standing and also concomitant injuries. In secure kids with injury, the gold requirement for imaging is CT [13]. If urethral or bladder injury is thought, urethrocytography needs to be done. Stomach masses need to be examined with ultrasound to distinguish in between cystic/hydronephrotic masses and also strong masses. Hydronephrosis will certainly be assessed by the urologist with a cystogram and also kidney check. Strong lesions are taken into consideration malignant as well as comprehensive work-up consisting of CT as well as MRI will certainly be done. In cases of urinary system infection, a cystogram is suggested due to the high rate of vesicoureteral reflux (VUR) in these patients. Preventative prescription antibiotics must be offered up until VUR is dismissed. Urinary system stone illness must be taken care of by the urologist as well as nephrologist with each other. In a lot of cases, a youth urinary system stone results from acquired illness; for this reason, a full metabolic examination ought to be carried out by the nephrologist. "Mechanical" analysis will certainly be done by the urologist [14]. CT and also IVP are exceptional methods to recognize as well as prepare therapy for urinary system rocks; nevertheless it must be born in mind that these kids will certainly require lots of analysis imaging examinations as well as will certainly have considerable direct exposure to radiation; for that reason, ultrasound is a fairly excellent method for subsequent actions. A background of hematuria adhering to the top respiratory system or gastrointestinal illness, along with indicators of edema, hypertension, as well as rash, must guide us to the medical diagnosis of glomerular conditions. If the urologist is the primary physician, he could advertise the medical diagnosis by taking throat cultures, enhance degrees, as well as antistreptolysin. Care needs to be required to evaluate the patient's blood pressure as well as to validate that kidney function is typical. Management must be under the guidance of a doctor; nonetheless, if hypertension, edema, or damaged kidney function exists, the patient needs to be looked after in a health center center.

**Medical Care:**

Asymptomatic (separated) hematuria normally does not need therapy. In problems related to unusual scientific, research laboratory, or imaging research studies, therapy could be required, as proper, with the primary medical diagnosis [15].

**Surgical Care:**

Surgical treatment might be needed in particular physiological problems, such as ureteropelvic junction obstruction, tumor, or considerable urolithiasis.

**Diet:**

Nutritional changes is generally not suggested besides kids that could have a tendency to establish hypertension or edema as a result of their primary illness procedure (eg, nephritis). In these patients, a reduced sodium diet regimen might be valuable. On top of that, a diet having the suggested day-to-day quantity (RDA) for calcium plus a low-salt diet plan might be advantageous in youngsters with hypercalciuria as well as hematuria.

**More Outpatient Care:**

Patients with relentless microscopic hematuria ought to be checked at 6-month to 12-month periods for the look of indications or signs a measure of modern kidney illness. Noticeable amongst them are proteinuria, hypertension, and a reduction in kidney function.

#### 4. CONCLUSION

Blood in urine - recognized clinically as hematuria. The majority of the disorders that might trigger hematuria are "nonsurgical, non-uological" illness and need to be managed by a general physician. Usually blood in the urine is not life-threatening, nevertheless, it should not be neglected. All situations of hematuria need to be assessed by a physician that could order examinations to verify or eliminate the cause. There is no particular therapy for hematuria, since it's symptom are not certain. That's why, therapy should be focused on the underlying reason.

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