

Non-Invasive Diagnosis of The Symptomless Hematuria

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Summary

Symptomless hematuria may be a sign of serious conditions. The urine specimens of 103 patients with asymptomatic hematuria were examined for red-cell casts.

Only 85 specimens were suitable for the red-cell casts examination, 42 patients (49.14%) were red-cell casts positive, revealing a glomerular origin of the hematuria.

Therefore, a selective application of possibly burdening and expensive urologic diagnostic procedures is possible by a simple, cheap and harmless urine examination demonstrating the presence or absence of red-cell casts in the urine.

Introduction

Hematuria is a problem commonly encountered in urological practice. The diagnosis is based on macroscopic and microscopic urine analysis. Microscopic hematuria is defined as 5 or more red blood cells per high powered field on a microscopic examination of the urinary sediment.

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Asymptomatic hematuria, gross or microscopic, may be a sign of serious conditions. Therefore, in all cases an attempt should be made to arrive at a diagnosis. For some patients this may involve unpleasant, expensive and potentially harmful procedures, such as cystoscopy, retrograde urography, arteriography, CT-scan or even renal biopsy.

Hematuria may be divided into hematologic, renal-glomerular, renal-non-glomerular, postrenal and "false" hematuria. The presence or absence of red-cell casts in the urinary sediment plays a crucial role in the differential diagnosis between glomerular and non-glomerular (urological) hematuria^{11,15,16}.

The present study is conducted to clarify further the exact place of this simple investigation in the diagnostic work-up of these patients.

Material and Methods

One hundred and three (103) patients with asymptomatic hematuria are included in this study.

All patients had proven hematuria, gross or microscopic. In all patients the renal function and blood-coagulation tests were normal. Proteinuria was either mild or absent. Intravenous urography was always unremarkable. The age of the patients ranged between 6 and 65 years. There were 54 male and 49 female patients.

Urine analysis for red cell casts was done on a fresh sample of the first voided portion of the morning urine. In general the urine was acidified by giving the patient Ammonium chloride 0.1 g/kg the evening before the examination. Acidification of the urine prevents the disintegration of casts.

Results

Of the 103 specimens examined, 85 were suitable for further analysis. As indicated in Table-I, 4 out of 54 samples were contaminated or infected in the male group whereas 14 out of 49 were unsuitable in the female patients.

Table-II gives the results. Thirty (30) male patients (60%) out of 50 showed to be red-cell casts positive. This was the case in 12 female patients (34%) out of 35. This means that in the group examined, 42 patients (49.41%) out of 85 with asymptomatic hematuria were red-cell casts positive, revealing a glomerular origin of the hematuria.

Discussion

Hematuria is an alarming symptom. In most of the cases macroscopic hematuria directly leads to further physical and clinical investigations. Microscopic hematuria may be noted during the course of an illness or discovered fortuitously during a routine examination of an asymptomatic individual. In most of the cases a diagnosis of an urological abnormality will be found as the cause of hematuria^{2,3,4,16}. This is certainly the case in symptomatic patients. In adults neoplasma, urinary tract infections, stones, prostatic hypertrophy, urethritis and urethro-trigonitis are amongst the more common causes of hematuria. In asymptomatic patients too, urologic abnormalities play an important role in the etiology. Once hematuria is confirmed by microscopic examination, an intravenous urography is the next step in the diagnostic follow-up. By this examination a urologic etiology will be clear or can be assumed. In these patients further urologic work-up and therapy should be instituted without any delay.

The question remains whether this diagnostic work-up should be performed in patients with asymptomatic hematuria and a completely normal IVU. Here the chances of renal-glomerular hematuria are more likely. Glomerular hematuria can only be confirmed by urine analysis for red-cell casts or by renal biopsy. It is clear that the presence of proteinuria, preferentially quantitated with a twenty-four hours urine protein measurement, is presumptive evidence of a renal origin of the bleeding. But even in the absence of massive proteinuria the demonstration of red-cell casts suggests strong evidence of a glomerular cause of the bleeding. This was the case in almost 50 percent of our patients.

In these patients, the diagnosis of glomerulonephritis can be put forward. This group of patients requires no further urological evaluation if renal function is normal.

Glomerular pathology in this group may vary, but mesangiopathic glomerulonephritis is most likely^{1,14}. In the presence of heavy proteinuria, the patient is at risk for further deterioration of the renal function. If there is only a mild proteinuria and certainly when no proteinuria can be found, glomerular hematuria is in general harmless and only a small percentage of patients will progress to chronic renal failure^{5,8,10,13}. These patients should have yearly blood pressure measurements, urinalysis and renal function determination to detect the occasional individual with progressive disease.

We do not perform routine renal biopsy because of the limited prognostic significance of a histologic diagnoses and the lack of proven therapy for glomerular disease found in this setting. Neither do we perform cystoscopy or arteriography, certainly not in the younger patients with red blood cells in the urine. The incidence of bladder lesions in these individuals is very low^{6,7,9,11,12}. This attitude is represented in Fig. 1 which demonstrates our diagnostic strategy in patients with asymptomatic haematuria. In all other patients especially in the older individuals, cystoscopic evaluation and, if negative, further diagnostic steps are necessary to clarify the underlying condition.

Conclusion

From the present study, however, we can conclude that a selective application of possibly burdening and expensive urologic diagnostic procedures is possible by a simple, cheap and harmless urine examination demonstrating the presence or absence of red-cell casts in the urine.

TABLE - I
URINALYSIS FOR RED CELL CASTS IN PATIENTS
WITH ASYMPTOMATIC HEMATURIA

Number of Patients: 103

Age range: 6 - 65 years

	Male	Female
Contaminated	02	10
Infection	02	04
Suitable	50	35
Total	54	49

TABLE-II
URINALYSIS FOR RED CELL CASTS IN PATIENTS
WITH ASYMPTOMATIC HEMATURIA

Male : 50

Female: 35

casts -ve	casts +ve	casts +ve	casts -ve
20 patients (40%)	30 patients (60%)	12 patients (34%)	23 patients (66%)

42 patients
 casts positive
 (49.41%)

FIGURE 1

DIAGNOSTIC STRATEGY IN PATIENTS WITH ASYMPTOMATIC HEMATURIA

Urinalysis	:	isolated (gross or microscopic) hematuria
Physical examination	:	normal
Intravenous urography	:	normal
Coagulation tests	:	normal

URINALYSIS FOR RED CELL CASTS

Positive

Negative

GLOMERULAR HEMATURIA

EXTRA-GLOMERULAR HEMATURIA

No further diagnostic steps

Further diagnostic steps such as:

- cytology
- cystoscopy
- rontgenology
- biopsy
- surgery

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