

# Causes of Gross Hematuria and Prevalence of Urological Carcinomas

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## ABSTRACT

**Aim:** To determine - the common causes of gross hematuria the frequency of urological carcinomas in patients with gross hematuria

**Study Design:** Cross-sectional/ observational study

**Place and Duration:** This study was conducted in Urology department Sandeman Civil Hospital Quetta from October 2018 to September 2020(3 years)

**Methods:** Total 195 patients of both genders presented with gross hematuria were included. Patients ages were ranging from 15 to 70 years Patients detailed demographic including age, sex, body mass index and causes of gross hematuria were recorded after taking written consent. Urine routine examination and urine cytology and microscopy were done to examine hematuria for excluding malignant cells. Patients were followed by ultrasound, X-ray KUB, CTU scan and cystoscopy when required. Causes of gross hematuria and their frequency was recorded. Data was analyzed by SPSS 24.0.

**Results:** There were 145 (74.36%) males and 50 (25.64%) females patients. Mean age of patients was 50.24±9.55 years. Most common cause of gross hematuria was trauma and found in 50 (25.64%) patients, urinary tract infection was the second most frequent cause found in 46 (23.59%) patients and 38 (19.49%) patients had urolithiasis. 35 (17.95%) patients had urological carcinoma while 160 (80.05%) patients had no urological carcinoma even though gross hematuria they had gross hematuria.

**Conclusion:** Although urological carcinoma was commonly associated with gross hematuria, but trauma and urinary tract infection were most frequent causes of gross hematuria.

**Keywords:** Gross Hematuria, Urinary Tract Infection, Trauma, Urological Carcinomas.

## INTRODUCTION

Adults in ambulatory care are typically observed with hematuria (1, 2). In the absence of hematuria, screening of the patients (3, 4) with urine dipstick and microscopic examination are recommended in millions of patients, as a common feature of primary care (5, 6). However, hematuria may also be an accidental finding in testing for other reasons. Considering the multiplex existence of dipstick tests, the frequency is not understood in terms of the primary objective of cancer screening. The reference series highlight the potential for a positive test result to be the presenting sign of occult cancer. Current guideline on hematuria highlight the structured urological investigations of this risk by bladder endoscopy (cystoscopy). However, there are substantial differences in the severity of cancer risk [7, 8], and confusion about the consistency of evidence in practice.

Hematuria also produces drastic effects as a blood in the urine that is highly noticeable. The classic manifestation of urinary stone disease is symptomatic gross hematuria with associated flank pain or renal colic, while painless gross hematuria has a stronger correlation with cancer. In the sense of a relatively high likelihood of pre-test of cancer or other clinically relevant underlying conditions, any episode of gross hematuric disease in adults, needs urgent urologic evaluation (coherently > 10% [7,8] and + 25% in certain referral series [9]).

Several factors are known in development of gross hematuria, in which trauma, urinary tract infection, urolithiasis and prostatic hyperplasia are the most common [10]. The incidence rate of urological tumors in patients with gross hematuria is very high, due to inaccurate assessment of gross hematuria by general practitioner [11]. The present study was conducted aimed to examine the prevalence of urological carcinomas in patients with gross hematuria and also to determine the causes of gross hematuria.

## MATERIALS AND METHODS

This cross-sectional/observational study was conducted at Sandeman Civil Hospital Quetta during the period from October

2018 to September 2020. Total 195 patients of both genders presented with gross hematuria, were included. Gross hematuria was defined as presence of red or brown urine (1 mL of blood per liter of urine can induce a visible color change). Patients ages were ranging from 15 to 70 years. Patients detailed demographic including age, sex, body mass index and causes of gross hematuria were recorded after taking written consent. Patients with renal failure, patients with microscopic hematuria and already diagnosed cases of urological carcinomas were excluded.

Urine routine examination, urine cytology and microscopic examination were performed to confirm the cases of gross hematuria and to exclude the malignant cells. Patients were followed by ultrasound, X-ray KUB, CTU scan and cystoscopy when required. Causes of gross hematuria such as trauma, urinary tract infection, urolithiasis, prostatic hyperplasia and heavy activities were examined. Frequency of urological carcinomas was recorded. Patients were investigated for previous episodes of hematuria. All the data was analyzed by SPSS 24.0.

## RESULTS

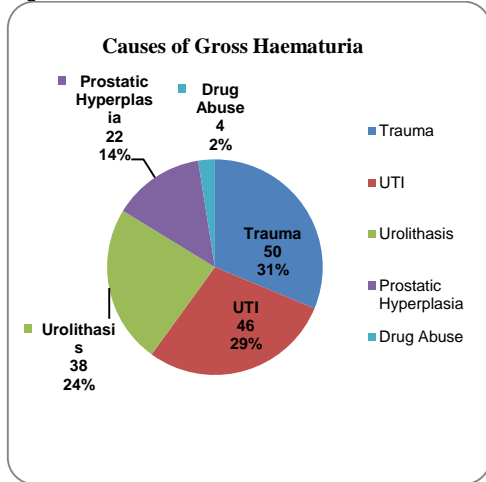
Out of 195 patients, 145 (74.36%) patients were males while 50 (25.64%) were females. Mean age of patients was 50.24±9.55 years. Mean BMI of all the patients was 23.24±1.46 kg/m<sup>2</sup>. (Table 1).

Table No 1: Baseline details of all the patients

Characteristics	Frequency No.	Percentage
Mean age (yrs)	50.24±9.55	-
Mean BMI ( kg/m <sup>2</sup> )	23.24±1.46	-
Gender		
Male	145	74.36
Female	50	25.64

Most common cause of gross hematuria was trauma and found in 50 (25.64%) patients, urinary tract infection was the second most frequent cause found in 46 (23.59%) patients and 38 (19.49%) patients had urolithiasis, prostatic hyperplasia was found in 22 (11.28%) patients and 4 (2.05%) patients had drug abuse respectively. (Figure 1)

Figure No 1: Causes of Gross Hematuria



Urological carcinomas were observed in 35 (17.95%) patients while 160 (82.05%) patients had no urological carcinoma. (Table No. 2)

Table No 2. Prevalence of Urological Carcinomas among all the patients

Variables	Frequency No.	Percentage
Urological Carcinoma		
Yes	35	17.95
No	160	82.05

**DISCUSSION**

Gross hematuria is one of the most common urological disorders associated with high rate of morbidity and mortality<sup>[13]</sup>. Many of studies demonstrated that patients with gross hematuria were on risk in developing urological carcinomas and the incidence rate of malignant cells in gross hematuria patients is quite high<sup>[14]</sup>. The present study was conducted to examine the prevalence of urological carcinomas in patients with gross hematuria and also examine the causes of gross hematuria. In this regard 195 patients with blood in urine were included. Majority of patients 74.36% were males while 25.64% were females with mean age of 50.24±9.55 years. These results were comparable to many of previous studies in which male patients' population was 70 to 85% and the average ages of patients were 45 to 65 years<sup>[15-16]</sup>.

In present study trauma was the most frequent etiology of gross hematuria and was found in 50 (25.64%) patients, urinary tract infection was the second most frequent cause found in 46 (23.59%) patients and 38 (19.49%) patients had urolithiasis, prostatic hyperplasia was found in 22 (11.28%) patients and 4 (2.05%) patients had drug abuse. Awan SD et al<sup>[17]</sup> reported trauma was the most frequent cause of gross hematuria, in which abdominal injuries, due to accidents and pelvic fractures were most common. Another study conducted by Ofer N. Gofrit et al<sup>[18]</sup> regarding frequency of gross hematuria in patients with prostate cancer. In their study they reported that bladder cancer was the most frequent cause of gross hematuria followed by urinary infection in 38.5% and 23% patients respectively.

In this study urological carcinomas was observed in 17.95% patients. 28% patients had first episode of gross hematuria while 30.72% patients had two or more episodes of gross hematuria. These results were similar to some previous studies in which urological tumors were directly associated to gross hematuria in 12% to 32%<sup>[19-20]</sup>. A study by William C et al, reported that 23% of

the patients who presented with gross hematuria had genitourinary carcinoma as the cause of their hematuria.

**CONCLUSION**

Gross hematuria is one of the common presentation of urothelial carcinoma. Trauma, urinary tract infections and urolithiasis were the most frequent causes associated with gross hematuria.

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