

Involved in Children Having Hematuria

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ABSTRACT

Objective: To find out pattern of presentation as well as factors involved in children with hematuria.

Study Design: Cross sectional study.

Place and Duration of Study: This multicentre center study was conducted at Children Hospital, Chandka Medical College, Larkana, Department of Paediatrics of Pir Syed Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat, and Department of Pediatrics of Ghulam Muhammad Mahar Medical College and Hospital, Sukkur from Jan 2019 to June 2019.

Materials and Methods: A total of 152 children, aged 1-15 years, reporting in out-patient department or emergency department, having hematuria (> 5 red blood cells per high power field in centrifuged urine following a positive dipstick test) were enrolled in this study. Demographic data like age, gender, sign and symptoms, along with risk factors, clinical features and laboratory investigations were recorded on a predesigned proforma. Mean and standard deviation was calculated for quantitative variables while frequency and percentages were calculated for qualitative variables.

Results: Out of a total of 152 children, 87 (57.2%) were male and 65 (42.8%) female. Most children, 66 (43.4%) were between 1 and 5 years of age while 49 (32.2%) between 6 to 10 years and 37 (24.3%) between 11 to 15 years. Most common presentation of children with hematuria were recorded as fever in 89 (58.6%) followed by red or cola color urine 66 (43.4%) and hypertension in 57 (37.5%). Post streptococcal glomerulonephritis was noted to be the commonest finding as 63 (41.3%) children had that whereas urinary tract infection 36 (23.7%), renal stone (11.2%) and vesico ureteric reflux were some of the other most common conditions.

Conclusion: Age group of 1 to 5 years and male gender seem to be more common among children having hematuria. Fever as well as red / cola color urine seemed to be the commonest presentation. Post streptococcal glomerulonephritis and UTI were the commonest factors found.

Key Words: Fever, hematuria, hypertension, urinary tract infection.

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INTRODUCTION

Hematuria is considered a common problem amongst children and described as > 5 red blood cells (RBCs) per high power field in sediment from 10ml of fresh voided and centrifuged urine.¹ The prevalence of

hematuria is presented as less than 1 to 14% with differences among different communities.²

Hematuria can be distinguished as macroscopic or microscopic haematuria. Many children having isolated microscopic hematuria do not need urgent investigations. Blood found in urine, can have origin from any part of urinary tract while gross as well as microscopic haematuria can indicate major underlying etiology.^{3,4}

Urine analysis done by dipstick is an important initial medical assessment. It has been estimated that about 50% of the patients having hematuria possess some sort of underlying defect and 10% having microscopic hematuria have been noted to contain urologic malignancy.⁵

Hematuria can be symptomatic as well as asymptomatic, transient or persistent, isolated or linked with proteinuria or some other urinary tract disorders. In comparison to gross hematuria, asymptomatic microscopic hematuria seems to be 10 times more common.⁶ Hematuria along with proteinuria is rare but their presence at the same time points major renal abnormality. Red urine is not always indicative of

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blood coming in the urine as beetroot as well as blackberries can cause redness to blood color, whereas, drugs like rifampacin and medical states like hemoglobinuria and myoglobinuria can also be the reason of red color urine.^{7,8}

Hematuria is considered a frequent finding in primary as well as tertiary care settings. American Academy of Pediatrics (AAP) removed routine urine analysis from their recommendations, but still, paediatricians use screening of urine as a part of their practice.^{1,9} Not all presenting with hematuria have underlying renal abnormalities but persistent hematuria requires further assessment depending upon the history and initial evaluation. AAP has not endorsed annual assessment of urine using dipstick analysis in paediatric population but many countries including Japan, Taiwan and Korea recommend regular routine screening among paediatric population.¹⁰⁻¹³

Laboratory investigations assessing haematuria usually depend upon history and physical examination. Investigations like urinalysis, blood urea nitrogen, serum creatinine, hematological and coagulation profiles, urinary calcium excretion, serological testing, urine culture, radiological studies and renal biopsy help identifying underlying etiology of hematuria.¹⁴ This study was planned to find out pattern of presentation as well as factors involved in children with hematuria. The findings of this study will help paediatricians and general practitioners in early identification of this common problem amongst pediatric age group.

MATERIALS AND METHODS

This was a cross sectional study from Jan 2019 to June 2019. Three centers were the venues for this study including Children Hospital, Chandka Medical College, Larkana, Department of Paediatrics of Pir Syed Abdul Qadir Shah Jeelani Institute of Medical Sciences, Gambat, and Department of Pediatrics of Ghulam Muhammad Mahar Medical College and Hospital, Sukkur.

A total of 152 children, aged 1-15 years, reporting in out-patient department or emergency department, having hematuria (> 5 red blood cells per high power field in centrifuged urine following a positive dipstick test)⁴ were enrolled in this study. All those children using rifampicin or food like beetroot, berries and food dyes were not included. Children on renal dialysis and using anti-coagulation therapies were also not included as well. Informed consent was taken from parents or guardians of all the study participants. Approval from institutional ethical and research committees were sought for this study.

Demographic data like age, gender, sign and symptoms, along with risk factors, clinical features and laboratory investigations were recorded on a predesigned proforma. SPSS version 21.0 was used for data analysis. Mean and standard deviation was calculated

for quantitative variables while frequency and percentages were calculated for qualitative variables.

RESULTS

Out of a total of 152 children, 87 (57.2%) were male and 65 (42.8%) female. Overall, mean age of the children studied was recorded to be 7.43 years with standard deviation of 3.39 years. Most children, 66 (43.4%) were between 1 and 5 years of age while 49 (32.2%) between 6 to 10 years and 37 (24.3%) between 11 to 15 years. There were 97 (63.8%) children who belonged to urban areas whereas 55 (36.2%) from rural areas.

Table No.1: Distribution of Gender, Age and Area of Residence Among Children With Hematuria

Study Variables	Number (%)	
Gender	Male	87 (57.2%)
	Female	65 (42.8%)
Age	1-5	66 (43.4%)
	6-10	49 (32.2%)
	11-15	37 (24.3%)
Area of Residence	Urban	97 (63.8%)
	Rural	55 (36.2%)

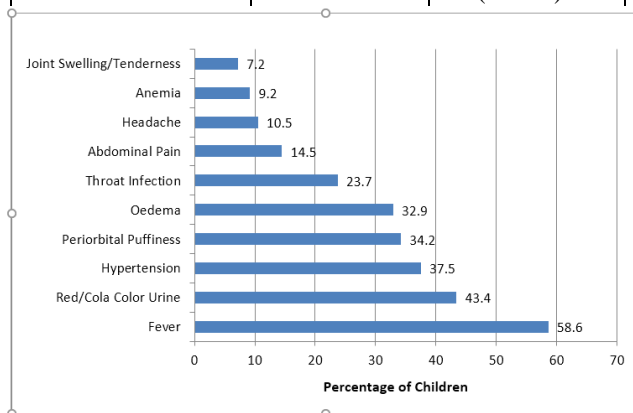


Figure No.1: Sign and Symptoms amongst children having Hematuria (Some sign and symptoms were overlapped)

Table No.2: Factors Associated With Hematuria Among Children

Clinical Condition	Number of Children (%)
Post Streptococcal Glomerulonephritis	63 (41.3%)
Urinary Tract Infection	36 (23.7%)
Renal Stone	17 (11.2%)
Vesico Ureteric Reflux	14 (9.2%)
Systemic Lupus Erythematousus	11 (7.2%)
Chronic Renal Failure	7 (4.6%)
Henoch Schonelon Purpura	5 (3.3%)
Atypical Nephrotic Syndrome	5 (3.3%)

Most common presentation of children with hematuria were recorded as fever in 89 (58.6%) followed by red or cola color urine 66 (43.4%) and hypertension in 57 (37.5%). Figure No.1 shows spectrum of presentation in children reporting with hematuria.

Table No.2 shows number having factors associated with hematuria. Post streptococcal glomerulonephritis was noted to be the commonest finding as 63 (41.3%) children had that whereas urinary tract infection 36 (23.7%), renal stone (17 (11.2%) and vesico ureteric reflux were some of the other most common conditions.

DISCUSSION

In children having microscopic or gross hematuria, initial visits of to clinicians with up to date knowledge about epidemiology and factors involved, can certainly lead to better management. It has also been advocated that early diagnosis of hematuria can prevent extra investigations as well as interventions.¹⁵

In the current work, most children, 87 (57.2%) were male and 65 (42.8%) female. Overall, mean age of the children studied was recorded to be 7.43 years with standard deviation of 3.39 years. Most children, 66 (43.4%) were between 1 and 5 years of age while 49 (32.2%) between 6 to 10 years and 37 (24.3%) between 11 to 15 years. A study conducted by Ahmed S et al from Lahore⁴ noted the mean of children having hematuria as 7.64±4.45 years which is quite close to which we noted. In the same study, the researchers noted an overall male predominance amongst children as male to female ratio of 1.2:1. A study conducted by Orta N et al² also noted the mean age of children with hematuria as 7.7±6.1 years which is again close to our findings. They also noted that age less than 5 years was the most common (40%) group amongst children. Gupta S and colleagues¹⁶ also got age 2 to 6 years as the most common age group amongst children.

In the present study, we found that 94 (61.8%) children were having microscopic hematuria where detection was based on dipstick and confirmation was done by analyzing urine sediment. Korean School Screening Program revealed that 50% of the children had microscopic hematuria.¹⁷

In the present work, most common presentation of children with hematuria were recorded as fever in 89 (58.6%) followed by red or cola color urine 66 (43.4%) and hypertension in 57 (37.5%). Ahmed S et al⁴ also noted fever to be the commonest complaint, noted in 54.7% children with hematuria whereas red or cola color urine was noted in 41.3% of the children. We noted abdominal pain in 22 (14.5%) children. Similar findings have already been reported in the past where abdominal pain was noted in 12% of children having hematuria⁴ whereas Vachvanichsanong P et al¹⁸ also reported 11.5% children having abdominal pain along with hematuria. A study from Korea¹⁹ revealed 17.5%

of the school going children with urinary abnormalities to have hematuria as well as proteinuria.

We noted that 23.7% of children having hematuria were seen to have urinary tract infection (UTI). UTI is quite common in children with hematuria especially in children with age between 1 to 5 years. Another local study⁴ noted 22.6% children between 1 to 5 years to be having UTI while similar findings were also recorded by Patel HP et al²⁰ where 19% of the children having hematuria had UTI. Other common findings in the present study were renal stone 17 (11.2%) and vesico ureteric reflux amongst children with hematuria. Our findings regarding vesico uteteric reflux were quite similar to other studies where authors reported vesico uteteric reflux in 8%⁴ and 6.4%²⁰ children. We had noted renal stone in 11.2% of children but other researchers²¹ have noted renal stones to be present as high as 20% children with hematuria. In another local study⁴ evaluating significance of presence of different factors with regards to hematuria among children, no significant difference has been recorded.

CONCLUSION

Age group of 1 to 5 years and male gender seem to be more common among children having hematuria. Fever as well as red / cola color urine seemed to be the commonest presentation. Post streptococcal glomerulonephritis and UTI were the commonest factors found.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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