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Clinico-epidemiological profile of children with of asymptomatic phase of renal disease

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Abstract

Pyuria is defined as more than 5WBCs/mm³ of urine and if this definition is taken into consideration it correlates in 90% cases of UTI. However, pyuria may be masked in significant infections due to Proteus, Klebsiella and Pseudomonas due to disintegration of White Blood Cells caused by alkaline condition produced by these urease positive organisms. Children were subjected to physical examination, blood pressure recording and urine was collected and further analyzed. All children were advised to collect mid stream clean catch urine sample under strict aseptic precautions. The collected urine samples were tested for protein, blood and bacteria by dipstick method and microscopy rapid screening test like griess nitrate test was done. 95% of the children had no RBCs in urine. 2.8% showed 1-5 RBCs/HPF. Significant hematuria (> 5 RBCs/HPF) was seen in 2.2% of children.

Keywords: renal disease, pyuria, significant hematuria

Introduction

Sir Robert Hutchison used to say that the ghosts of dead patients that haunt us do not ask why we did not employ the latest fad of clinical examination; they ask, "Why did you not test my urine?" Now-a-days the trend of urine testing is increasingly delegated to the non-medical persons, who may be inadequately trained in the performance and interpretation of the tests they perform and are unaware of their importance. All the doctors and students should be acquainted with the urine testing, which is an essential part of any medical examination^[1].

In symptomatic patients it is advised to make accurate diagnosis and to institute appropriate treatment. It is also advocated in failed short course treatment and recurrent UTI cases and in children with P.U.O. In asymptomatic cases it is carried out in preschool and school girls, diabetic patients and after instrumentation and urological operations. Three basic types of urine specimen are submitted for bacterial culture. These are midstream clean catch, catheter collected and suprapubically aspirated urine. The recommended procedure for transporting urine is immediate delivery to the laboratory or refrigeration until processing. Alternatively, 1.8% boric acid can be used as stabilizer^[2]. Most screening tests for UTI have been evaluated using 10⁵ bacteria/ml. Or greater for interpreting significant bacteriuria, whereas counts less than 10⁵ are considered to represent contamination. Pyuria is defined as more than 50 WBCs/ mm³ of urine and if this definition is taken into consideration it correlates in 90% cases of UTI. However, pyuria may be masked in significant infections due to Proteus, Klebsiella and Pseudomonas due to disintegration of White Blood Cells caused by alkaline condition produced by these urease positive organisms^[3].

Bacteria in urine can be detected by chemical tests like Griess Nitrate Reduction Test and Triphenyle-tetrazolium Chloride Reduction Tests. False-Positive Triphenyle-tetrazolium Chloride Tests is caused by low urinary PH and False-Negative by some organisms like Staphylococcus, Pseudomonas and some Enterococci which do not reduce this compound. Griess Nitrate Reduction Tests is available in many forms including Dipsticks. These sticks are 90% sensitive and 99% specific. 21 False-Positive results are uncommon, False-Negative results may be caused by low dietary nitrate, reduction of nitrate due to diuresis, infections due to enterococci and acinetobacter^[4].

Ultrasound examination provides excellent information about the anatomy of the urinary tract & ultrasound guidance can be used in invasive procedures, e.g., fine needle aspiration

and biopsy. The normal kidney has an elliptical shape. All along the margin there is the low echogenic cortex with evenly distributed triangular hypoechoic pyramids. In the center lies the intensely echogenic renal sinus fat. Cortical echotexture in children is hyperechoic compared with liver or spleen. A further increase in cortical echogenicity may be seen in renal parenchymal diseases but is non specific.

The major drawback of ultrasonography is that it is operator dependent. Considerable experience is required for interpretation of findings in infants and neonates.

Careful examination should be done to see if hematuria is persistent, to detect urinary tract infection and confirm that there is no proteinuria. A family history of kidney disease and urolithiasis should be obtained. Physical examination of the child should include assessment of growth and evidence of an acute or chronic renal failure such as edema, hypertension, unexplained anemia, bony abnormalities and growth retardation. Abnormality of eyes and ears should be looked for. Ultrasound abdomen is obtained. Urinary calcium to creatinine ratio should be determined to exclude hypercalciuria. Family members examined for the presence of microscopic hematuria. Further laboratory studies are not indicated. Child should be examined once a year and urine analysis carried out. If any abnormal features appear or proteinuria develops other studies should be performed [5, 6].

Methodology

Source of data

Asymptomatic school children of both sexes selected from slum schools

Method of collection of data

A cross sectional study was conducted on 500 school going children of both sexes. An informed consent was obtained followed by a visit to the institution. Children were subjected to physical examination, blood pressure recording and urine was collected and further analyzed.

All children were advised to collect mid stream clean catch urine sample under strict aseptic precautions. The collected urine samples were tested for protein, blood and bacteria by dipstick method and microscopy rapid screening test like griess nitrate test was done.

Culture Criteria

1. Presence of bacteria on microscopy
2. Presence of protein on dipstick
3. Presence of pus cells on high power field of microscopy in centrifuged samples of urine
4. Presence of RBCs cells on high power field of microscopy in centrifuged samples of urine
5. Positive griess nitrate test

Children with positive findings were further evaluated for cause of proteinuria, bacteriuria and hematuria.

Sampling Method

Cases were selected on the basis of probability proportionate to the sample size. (Probability Proportionate Sampling technique). From each school students of both sexes were selected on the basis of probability proportionate sampling till the required sample size was obtained.

Results

In our study male children were 59.2% (296) & female children were 40.8% (204). Most common age group was 13 years (18.6%) followed by 9 years (13.8%), 10 years (11.2%) & 6 years (10.6%)

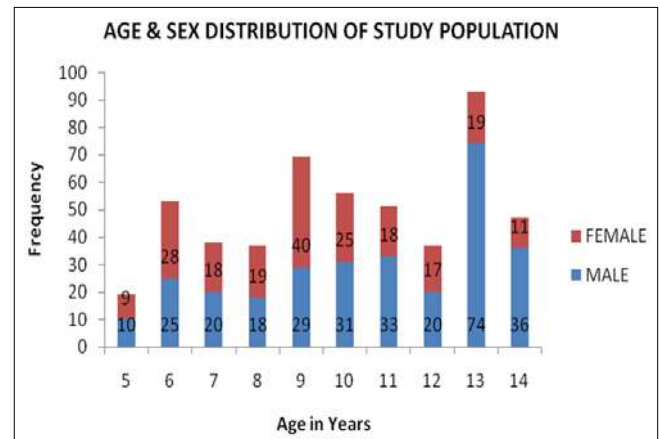


Fig 1: Age and sex distribution of study population

Table 1: Distribution of study population according to pem grade

Grade	M	F	Percentage
Normal	135	45	36
Grade i	108	92	40
Grade ii	50	60	22
Grade iii	3	7	2
Total	296	204	

Chi square value: 32.97 P value: <0.001

Table showing PEM grading of the study population according to IAP classification. 36% of the children were normal. 40% had Grade I malnutrition, 22% had Grade II malnutrition 2% had Grade III malnutrition.

Table 2: Distribution of study population according to height percentile

Grade	Male	Female	Percentage
5-50	194	166	72
51-90	102	38	28
Total	296	204	

Chi square value: 15.01 P value: <0.001

Table showing the height percentile of the study population. All the children were between 5 – 90 percentile for their age & sex.

Table 3: Distribution of study population according to presence of proteinuria by dipstick

	Male	Female	Percentage
NIL	242	168	82
Trace	43	27	14
One plus	10	7	3.4
Two plus	1	2	0.6
Total	296	204	

Chi square value: 0.98 P value: 0.80

Table showing the results of dipstick test of the population. 82% showed no protein in urine. 14% showed traces of protein. 4% had significant proteinuria. P value was not significant.

Table 4: Distribution of study population according to presence hematuria

	Male	Female	Percentage
NIL	282	193	95
1-2	6	3	1.8
3-5	3	2	1
>5	5	6	2.2
Total	296	204	

Chi square value: 1.07 P value: 0.78

95% of the children had no RBCs in urine. 2.8% showed 1-5 RBCs/ HPF.

Significant hematuria (> 5 RBCs/ HPF) was seen in 2.2% of children.

Table 5: Distribution of study population according to results of griess nitrate test

	Male	Female	Percentage
Positive	4	2	1.2
Negative	292	202	98.8
Total	296	204	

Chi square value: 0.14 P value: 0.70

Griess nitrate test was positive in 1.2% (6 cases), negative in 98.8% (496 cases).

Discussion

A total of 500 school children from urban slums of Mysore were screened for presence of asymptomatic hematuria, bacteriuria & proteinuria. Children with positive results were further evaluated to detect the cause. Culture was done on children with significant hematuria (> 5 RBCs/ HPF), significant proteinuria (> 30 mg/dl), and bacteriuria (griess nitrate test & bacteria & pus cells > 5).

There have been number of studies reporting the incidence of asymptomatic proteinuria. The prevalence of persistent proteinuria found in two or more sample range from 0.38 to 2.5%.

In the present study the incidence of proteinuria was found to be 4%. The results were comparable with that of Dodge W *et al.* [7] & Parakh P *et al.* [8] There was no significant cause for proteinuria in the present study except for one case where culture was positive. This may be explained by orthostatic proteinuria.

Normally about one million RBCs pass into the urine, which correlates with presence of one to three RBCs per high power field of centrifuged urine sediment examined microscopically. Transient microscopic hematuria was found in 16% of men & 13% of premenopausal women but no obvious serious cause was found in most cases. Usually fever, infection, trauma & exercise are the potential causes of transient hematuria. Acute infection of urinary tract such as cystitis, urethritis & prostatitis, is usually asymptomatic and is responsible for 5 to 25% of all cases of hematuria. If urine culture is negative the possibility of Chlamydia should be considered.

20% of all hematuria case are caused by stone disease, hypercalciuria & hyperuricosuria have been associated with hematuria even in the absence of demonstrable renal stones.

37% of patients with isolated hematuria had either hypercalciuria or hyperuricosuria.

In the present study the incidence of hematuria was found to be 2.2%. The results were comparable with that of Hajar F [9], Murakami M, Patil PM [10] & Parakh P [8]. In the present study 11 patients had significant hematuria, out of one had renal calculus & one had glomerulonephritis. Rest of the children had no significant cause for hematuria.

Conclusion

The incidence of proteinuria was found to be 4%. There was no significant cause for proteinuria in the present study except for one case where culture was positive.

95% of the children had no RBCs in urine, 2.8% showed 1-5 RBCs/ HPF and Significant hematuria (> 5 RBCs/ HPF) was seen in the 2.2%(11 cases). The incidence of hematuria was found to be 2.2%. In the present study 11 patients had significant hematuria, out of which one had renal calculus & one had glomerulonephritis.

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