

An Overview of Renal Diseases in Children in Pokhara

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Abstract

Objective: To determine the current pattern and prevalence of renal diseases in childhood in this region of Nepal.

Material and Methods: A retrospective study of the renal diseases in children attending the Pediatric OPD and those hospitalised in Manipal Teaching Hospital, Pokhara was done over a period of 6 years (September 2000-September 2006). A detailed clinical and laboratory evaluation was performed at baseline. The children were managed according to disease diagnosed. These cases are under follow up and some have undergone surgical treatment. **Results:** 228 children (123 boys & 105 girls) were diagnosed to have renal disease. Among them 39.5% had urinary tract infection (UTI), 30.7% were suffering from acute glomerulonephritis (AGN), 17.5% were cases of nephrotic syndrome (NS) and 12% had some other problems for example, 6.14% had genetic defects, 2.63% had renal Stone, 2.2% had pre-renal acute renal failure, unexplained recurrent hematuria in 1.3%. All the cases of UTI underwent through investigation and were treated accordingly. All cases of AGN are planned for follow up for 1½ yrs and among them 3 required biopsy till date. All cases of NS are under regular follow-ups and 2 have undergone biopsy. Renal stone was operated successfully. All cases of acute and chronic renal failures had required dialysis. Out of 5 (2.5%) chronic renal failures, 2 with end stage renal disease expired after repeated hemodialysis and three are still requiring dialysis. Among the obstructive uropathies, 43% had renal stone, 36% had posterior urethral valve and 21% VUR. **Conclusion:** It can be concluded that renal disease is not uncommon in children. It can be completely cured with proper and adequate treatment. Sometimes it has a bad prognosis when it reaches end stage renal disease. Early recognition, timely treatment and regular follow up are mandatory in management of children with renal diseases.

Key words: Renal disease pattern, UTI, AGN, NS, Obstructive Uropathy, Renal failure

Introduction

Childhood Renal Diseases (CRD) are commonly associated with few or no specific symptoms¹. This fraction of patients may not be managed adequately, hence the diagnosis of these cases are important. This study therefore evaluates the current pattern and prevalence of renal diseases in childhood. This study also points out the relative public health problems of renal diseases in childhood.

Materials and Methods

This was a retrospective study carried out for a period of 6 years from September 2000 to September 2006. All children attending the Paediatric Outpatient Department and those admitted in the paediatrics ward of Manipal Teaching Hospital were included in this study. All the children had come with symptoms related to the renal system. Every case was subjected to a detailed clinical examination, followed by relevant investigations. The children were divided in to four age groups; 0-1 yr, >1-5 yr, >5-10 yr and over 10 years. The renal problems were classified as Urinary Tract Infections (UTI), Acute Glomerulo Nephritis (AGN), Nephrotic Syndrome (NS), & Others. The investigations included routine urine examination, renal function tests, ultrasonogram (USG) abdomen, Micturating Cystourethrogram (MCU), Intravenous Pyelography (IVP) and other scans as required.

Results

There was total of 228 children. Age range was 0-14 years with male (123) to female (105) ratio of 1.2:1. Most of the cases were between ages of 5-10 years and above 10 years (Table 1). The pattern of renal disease that was seen is as per Table 2. It was seen that the maximum number of cases were Urinary Tract Infection (UTI), Acute Glomerulonephritis (AGN) and Nephrotic syndrome (NS) accounting for 39.5%, 30.7% and 17.5% respectively. Twelve percent of the patients had other problems like congenital defects which were seen in 6.14%, renal stones in 2.63% and pre renal acute renal failure in 2.2%, and unexplained recurrent hematuria in 1.3% of the cases. UTI was seen more in the girls as compared to other problems, which were seen more in males. Figure 1 shows the causes of obstructive uropathies namely; Bilateral Double Collecting System With Hydronephrosis 1(8.3%), Posterior Urethral Valves with Hydronephrosis 6 (50%), VUR With Obstructive Uropathy 5(42%), Table 3 shows causes of renal failure with prerenal cause predominating. The signs and symptoms with which the child had presented on first visit are shown in Table 4. Main signs and symptoms were fever 117 (51%), puffy face/ oedema 105 (46%), hypertension 89 (39%), hematuria 87 (38%). The other symptoms were oliguria 70 (30.7%), pyoderma 67 (29.3%), sore throat 55 (24%), burning urine 55 (24%), pain abdomen 54 (23.7%),

increased frequency of urination 51 (22%), chills and rigor 50 (22%), headache 47 (20.6%), vomiting 45 (19.7%), convulsion 42 (18.4%), dysuria 36 (15.8%), decreased appetite 35 (15.4%), constipation 35 (15.4%), dribbling of urine 31 (13.5%), renal angle tenderness 25 (11%), excess cry 20 (8.8%), retention of urine 20 (8.8%), discharge per vagina 20 (8.8%), abdominal lump 5 (2%) and joint pain with rash 3 (1.3%). Special procedures and management done is shown in Table 5. All the cases of UTI underwent thorough

investigations and were treated accordingly. All cases of AGN are planned for follow up for 1-½ yrs and among them three patients required biopsy till date. All cases of NS are under regular follow-ups out of which two have undergone biopsy. Renal stones were operated successfully. All cases of acute and chronic renal failures had required dialysis. Out of 3 (25%) chronic renal failures 2 with End stage renal disease expired after repeated hemodialysis and one is still requiring dialysis.

Table 1: Age and Sex Distribution at Presentation

Sex	Age				Renal Diseases
	<1yr	>1-5yr	>5-10yr	>10yr	
Male=32 (35.5%) Female=58 (64.5%)	9	11	10	2	UTI (n=90)
	7	15	21	15	
Male=45 (64.3 %) Female=25 (35.7%)	0	2	17	26	AGN (n=70)
	0	1	9	15	
Male=25 (62.5%) Female=15 (37.5%)	1	12	8	4	NS (n=40)
	1	8	2	4	
Male=21 (76%) Female=7 (24%)	3	8	4	6	Others (n=28)
	1	0	3	3	
Total	22	57	74	75	228

Table 2: Pattern of Renal Diseases

Renal disease (n=228)	Number	Percentage
Urinary tract infection (UTI)	90	39.5%
Acute glomerulonephritis (AGN)	70	30.7 %
Nephrotic syndrome (NS)	40	17.5 %
Congenital Defects 1. Agenesis of left Kidney= 1(0.44%) 2. Horseshoe Kidney=1(0.44%) 3. Obstructive uropathy: (n= 12) · Bilateral double collecting system with Hydronephrosis= 1(8.3%) · Posterior Urethral Valves with Hydronephrosis= 6 (50%) · VUR with obstructive uropathy = 5 (42%)	14	6.14%
Renal stone	6	2.63 %
Pre renal acute renal failure	5	2.2 %
Hematuria	3	1.3%
Total	228	100%

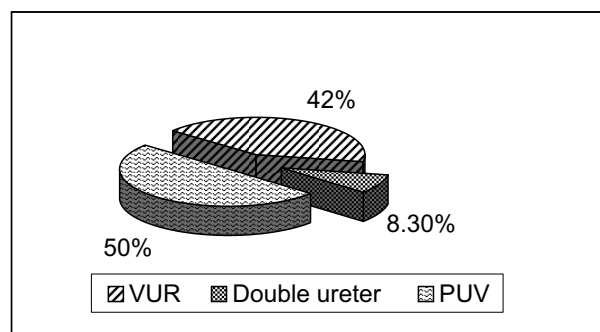


Fig 1: Causes of Obstructive Uropathy;(N=14)

Table 3: Causes of Renal Failure

Total cases n =228	Number	Percentage
Acute renal failure (n=9)=3.9%		
-Prerenal :		
Post diarrhea	3	33%
Septicemia	2	22%
Renal cause:		
Post-Streptococcal	2	22%
Glomerulonephritis		
Hepato-renal failure (cause not sure)	1	11%
Post Renal :		
Posterior Urethral Valves	1	11%
Chronic renal failure (n=8)= 3.5%		
Glomerulonephritis		
Obstructive uropathy	4	50%
Nephritic syndrome	3	37.5%
	1	12.5%

Table 4: Signs and Symptoms at Presentation

Signs and Symptoms	Number (n=228)	Percentage
Fever	117	51%
Puffy face/oedema	105	46%
Hypertension	89	39%
Hematuria	87	38%
Oliguria	70	30.7%
Pyoderma	67	29.3%
Sore throat	55	24%
Burning urine	55	24%
Pain abdomen	54	23.7%
Increased frequency	51	22%
Chills rigor	50	22%
Headache	47	20.6%
Vomiting	45	19.7%
Convulsion	42	18.4%
Dysuria	36	15.8%
Decreased appetite	35	15.4%
Constipation	35	15.4%
Dribbling urine	31	13.5%
Renal angle tenderness	25	11%
Excess cry	20	8.8%
Retention of urine	20	8.8%
Discharge PV	20	8.8%
Abdominal lump	5	2%
Joint pain with rash	3	1.3%

Table 5: Special Procedures and Management Required

Procedures/Management	Number (n=228)	Percentage
Dialysis	12	5.3%
MCU	12	5.3%
Surgery	6	2.6%
Renal Biopsy	5	2.2%
Mortality	5	2.2%
Referred to Higher Centre	4	1.8%

Discussion

Children with renal disease are brought to the hospital with a variety of symptoms, regardless of being related to the symptoms of kidney diseases or not². In our study out of all the children who attended the paediatric OPD in a period of 6 years, 250 were found to have significant findings that warranted a full pattern of investigations related to kidney disease, including urine routine examination, urine culture and sensitivity, renal function tests, ultra sonogram etc. Out of these 228 were finally labelled to have renal problems. In the general population, about 30 people in every 100,000 develop kidney failure each year. In the paediatric population of the age group 19 and under; the annual rate is only 1 or 2 new cases in every 100,000 children³. The number of urinary tract infections (UTIs) were the highest accounting for 39.5% of cases and then 30.7 % were of acute glomerulonephritis (AGN) followed by 17.5 % of nephritic syndrome (NS). Throughout childhood, the risk of a UTI is two percent for boys and eight percent for girls⁴.

Incidence and prevalence of nephritis in the paediatric population is not known⁵. However in a study by Zhongguo Dang Dai Er Ke Za Zhi 29.09% were diagnosed as nephrotic syndrome, 22.00% as acute nephritis syndrome, 17.21% as isolated hematuria, 15.87% as purpura nephritis, and 7.30% as hepatitis B virus-associated nephritis.⁶ This pattern is different from the pattern seen in our study. In the developed countries Acute post infectious (most often post streptococcal) GN has almost been wiped out but in Asia it still accounts for a large number of cases⁷. The overall prevalence of NS in childhood is approximately 2-5 cases per 100,000 children. The cumulative prevalence rate is approximately 15.5/100,000⁸. The type of symptoms that should be of significance include edema, oliguria, hematuria, anuria and even evidence of renal failure. In older children presence of fever, hypertension, are some modes of presentations⁹. These features were noted in our study also. Hematuria is one of the most common urinary findings that bring children to the attention of the paediatric nephrologists¹⁰. Thirty eight percent of our cases also presented with hematuria. Acute renal failure is a serious condition in critically ill patients, but less literature is available on acute renal failure in critically ill children¹¹. The incidence rate of acute renal failure in PICU was 4.5%¹¹. In our study 3.9% of the patients presented with ARF. The most common causes in our case was due to prerenal conditions like Post Diarrhoeal conditions, Septicemia followed by Post-Streptococcal

Glomerulonephritis, Hepato-renal failure and Posterior Urethral Valve. While in another study the main cause of ARF was hemolytic uraemic syndrome in 18.2%, oncologic pathologies in 18.2% and cardiac surgery 11.4%¹¹.

In a study by Kari JA sixty-six children had chronic renal failure (CRF) over a period of 4 years whereas we had only 8 cases over 6 years. Congenital abnormalities of the renal system were the major cause of CRF (50%) followed by neurogenic bladder (19.6%), either idiopathic (6%) or associated with neural tube defects (13.6%). Hereditary conditions were the cause in 12% and glomerular disease in 13.6%¹². In our study Glomerulonephritis, Obstructive Uropathy and Nephrotic Syndrome were the causes of CRF.

Coming to management part the cost of investigations and treatment of these children is expensive and many patients in the developing world cannot afford it. Children with renal disease may require simple treatment in the outpatient department or may be so serious that they may require treatment in a paediatric renal or intensive care (PICU) unit, or may require continuous renal replacement therapies such as haemofiltration (HF). The special procedures that was carried out was micturating cystourethrogram (MCU) in 5.3% cases which helped us to diagnose obstructive uropathy. Renal biopsy was done only in 5 (2.2%) cases probably due to the expensive cost and also due to lack of a good histopathological support. Other specialized procedures are not available in this part of the country. Many of our cases were managed in the outpatient department and the inpatient ward of the paediatric department. Some required PICU care and a 12 (5.3%) cases required dialysis. In a study by Kari JA 10.6% received hemodialysis and 21.2% cases had received peritoneal dialysis¹². Yet in another study peritoneal dialysis (PD) was done in 23%, hemodialysis (HD) in 15%, HF in 28%¹³. With recent advances, stone management has changed from an open surgical approach to a less invasive procedure such as extracorporeal shock-wave lithotripsy and endoscopic techniques. Herein, in our study all cases of renal stone underwent successful surgery. Finally 4 (1.8%) cases were referred to higher centers for management in a nephrology unit. Five patients (2.2 %) died. Mortality reported by others were from 18%-20%^{12,13}.

Conclusion

The early detection of renal diseases in childhood leads to better treatment and reduction in the mortality and morbidity. Our study, which is the first from the western region in Pokhara attempts to show the incidence and prevalence of renal disease in children. The difficulty of determining these relates to frequent under diagnosis. Many tests are available but in developing countries most cannot be done as these are unavailable or are too expensive. This constitutes a big public health problem and as facilities for treatment are expensive or not available, many children die before getting optimal treatment.

Acknowledgements

The authors take this opportunity to thank Dr S.K Dham Dean &CEO, Manimal College of Medical Sciences, Pokhara

,for the necessary encouragement and support imparted to bring out this publication.

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