Chronic renal failure in children at Aseer Region

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Vol. 13, No. 1 (2009-01 - 2009-12)

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Abstract

To have a base line of findings to evaluate the introduction of the pediatric peritoneal dialysis unit which was established recently in Aseer Central Hospital. Over a 10 year period (January 1998 to December 2007), a total of 89 patients below the age of 18 years were diagnosed with chronic renal failure. Their records were reviewed and information about age, sex and age at diagnosis, primary diseases, modalities of treatment, biochemical blood tests and radiological and kidney biopsy findings were all studied. Results: The mean age at diagnosis was 8.6 ± 6.3 years. The male: female ratio was 50.6:49.4. Etiological factors for CRF included congenital urological malformation (44.9%), glomerulonephritis (20.2%), hereditary disorder (10.1%), miscellaneous (11.2%) and unknown etiology (13.5%). Conservative treatment alone was performed in 32.5%, hemodialysis in 40.5% and peritoneal dialysis in 20.2%. Six cases were transplanted. Conclusion: The early recognition of congenital malformation and early treatment of recurrent urinary tract infection will prevent this condition.

Key words: Chronic renal failure, Etiology, Children

Accepted March 08 2009

Introduction

Chronic renal failure (CRF) is uncommon in Pediatrics. However, early recognition is important because the treatment and progression of CRF in children has significantly improved with the introduction of dialysis and kidney transplantation to this population. [1] Some authors have studied the issue of CRF in children.[2,3,4] Defining the etiology of CRF in children and adolescents could help with the management or delay the development of end stage renal disease (ESRD). [5]

The epidemiological data of chronic renal diseases in children is very important in order to plan for their special medical requirements e.g. dialysis and kidney transplantation, so, it is important to do a periodic studies on the epidemiological data on CRF in children as with time the etiology and epidemiology of CRF in children may change especially in areas where they plan for starting a new units for kidney disease. The aim of this study is to provide epidemiological data about CRF in children in Aseer region after establishing Pediatric peritoneal dialysis unit in 2005.

Patients and Methods

Data was collected from all children with chronic renal failure who attended Aseer central hospital between January 1998 and December 2007 and aged less than 18 years at the time of diagnosis.

The patient's data included patient's age at diagnosis, gender, diagnosis, medical, family and social history, physical examination, radiographic studies and renal biopsy findings. The criteria for diagnosing glomerulonephritis were clinical, laboratory and kidney biopsy findings. CRF was defined as glomerular filtration rate below 50m//min/1.73m^2 for at least 3 months as described by Schwartz formula [6] or by serum creatinine level > 2mg/dl (176.8µmol/L) for 0-2 year old, 2.5mg/dl (221µmol/L) for 3-10 years old and 3mg/dl (265.2µmol/-L) for 11-17 years old. [7]

Results

This study group comprised 45 males (50.6%) and 44 females (49.4%). The mean age of this group is 14.4±8.4 years while the mean age at diagnosis was 8.68±6.3 years. The serum creatinine for these patients was 10mg/dl± 23.7 and the serum PTH was 169.2±161.2.

Primary diseases that led to the renal failure are shown in Table.1. It is seen that the most common causes were congenital urologic malformations in 38 (42.7%) patients. Post glomerulonephritis was responsible for renal failure in 17 patients (19.1%). The cause was unknown in 12 patients (13.5%) while vascular and hereditary diseases were responsible for 4.5% of cases each. Other causes include HUS in 4, Urinary tract infection in1, chronic phyelonephritis in 4 and Barter syndrome in 1. Congenital urologic malformations causing renal failure were obstructive uropathy (55.3%) followed by reflux nephropathy (26.3%) and different types of aplasia (18.4%).

Table 1. Primary disease causing renal failure patients

	N	**%**
Age	14.4	8.4
Age at diagnosis	8.6	6.3
Male	45	50.6
Female	44	49.4
Disease	**N**	**%**
Congenital urological malformation	40	44.9
Glomerulonephritis	18	20.2
Others:	10	11.2
HUS	4	
Urinary tract stone	1	
Chronic pyelonephritis	4	
Barter syndrome	1	
Hereditary disorder	9	10.1
Unknown cause	12	13.5
Total	89	100
	Mean	**%**
Obstruction uropathy	21	55.3
Reflux nephropathy	10	26.3
Kidney aplasia, hypoplasia dysplasia	7	18.4
Total	38	100

Table 2: Mode of treatment

Conservative	29	32.5
Hemodialysis	36	40.5
Peritoneal dialysis	18	20.2
Kidney transplantation	6	6.8

Majority of children were treated conservatively (29.2%). Haemodialysis was done for 13.6% and peritoneal dialysis (both APD and CAPD) was the treatment of choice for 9% of patients. Transplantation was performed for 6 cases. However the conservative treatment was provided with other types of treatment in a considerable proportion of patients. Thus, it accompanied heamodialysis in 27% of cases, peritoneal dialysis in 11.2% and transplantation in 5.7% of cases (Table. 2). patients (13.5%) while vascular and hereditary diseases were responsible for 4.5% of cases each. Other causes include HUS in 4, Urinary tract infection in1, chronic phyelonephritis in 4 and Barter syndrome in 1. Congenital urologic malformations causing renal failure were obstructive uropathy (55.3%) followed by reflux nephropathy (26.3%) and different types of aplasia (18.4%).

Discussion

This is the first study describing the epidemiology of CRF in children in Aseer region, Southwestern Saudi Arabia after establishing the pediatric nephrology unit.

The reported age adjusted per million population (pmp) prevalence of CRF in children up to 18 years of age in KSA is 20.4 per million).[8] According to the SCOT data, the annual incidence of ESRF in Saudi children up to 20 years of age is 14pmp [9].

It is very difficult to estimate the exact number of cases of CRF in children because many patients remain asymptomatic, and the disease sometimes is detected by chance.

There is some predominance of male to female ratio in this study which is not the case in other studies. [3,10-12] This might be due to the social peculiarities of the Saudi society where male children are more privileged by the parents, making them more accessible to health services.

The primary causes of CRF in our unit showed that malformations of the urinary tract constituted the prominent group in our patients (44.9%). This was also the leading cause of CRF in children in most other studies worldwide.[2,4,7,13] as well as in some national reports. [3,10] The availability of good antenatal care for all pregnant women and the early recognition and treatment of urinary tract infection, markedly improve the long term prognosis of this cause.

Our patients were late in presenting with CRF than those reported in some other studies, [14] with mean age at diagnosis (8.6 years ± 6.3). This may be due to late diagnosis and ineffective treatment of recurrent UTI. Among the congenital urinary tract malformation obstructtive uropathy constituted about 55.3% in our study and hypoplasia and dysplasia about 18.4% which was almost similar to other national and international studies. [4,7,10,14] Re-Chronic renal failure in children at Aseer Region.

flux nephropathy constituted about 26.3% ,a high figure when compared to the other national studies 4,14] and quiet near similar to some international studies. [7,13] High consanguinity among Aseer couples might play a role in this high figure.

Hereditary renal disorder caused 10.1% of CRF cases in our study which is less than some national studies [12,14] but higher than other international studies.[4,13] We think that the relatively high hereditary disorder in our country is partly due to the above mentioned high incidence of consanguineous marriage. [12] Glomerulonephritis caused about 20.2% of CRF in our study which was higher than previous national studies [3,10,12] but less than a Jordanian and a Vietnamese studies.[2,4] This may be due to some ethnic differences or to the use by different studies to different diagnostic criteria.

Other miscellaneous causes for CRF in this study represent low figure that differs insignificantly from other studies. [10,11,14]

The cause was unknown in 13.5% of CRF causes in our patients. This figure is higher than in many other studies,[2,10,13]. The difference in awareness and level of health education in the Southern region of Saudi Arabia might be a factor for the low prevalence of the CRF in our patients.

About 61% of our patients are in ESRF; this finding differs from the prevalence found by other studies. [11,14] This might indicate that dialysis extended considerably the life expectancy of many patients beside that our study extended over a considerable longer time than the above mentioned studies.

Although the peritoneal dialysis is nowadays the recommended procedure in pediatric ESRD, its prevalence in our study is almost half (20.2%) the prevalence of hemodialysis (40.6%). This is because the peritoneal dialysis unit was established relatively recently in year 2005 at Aseer Central Hospital.

The kidney transplantation was done for 6 patients outside Aseer region in specialized hospitals in Riyadh or abroad.

The early recognition of congenital malformation in the antenatal and postnatal periods as well as early diagnosis and treatment of UTI and other controllable causes can not be over emphasized. Better recognition and awareness of the predisposing conditions and treatment of CRF and ESRDwill improve the quality of life and longer survival of these patients.

This study was conducted in order to evaluate the impact of introducing the newly established pediatric peritoneal dialysis unit on the pattern of end stage renal disease treatments on the region.

Acknowledgement

The author would like to acknowledge the effort Prof. Ismail Abdelmoneim of the Department of Family and Community Medicine, College of Medicine, King Khalid University, Abha, for reviewing the manuscript and Mr. Allan Agaton for typing out the article.

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