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Research Article

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Pattern and Factors of Renal Disease Among Children Admitted in a Tertiary Level Hospital, Dhaka, Bangladesh

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ABSTRACT

Introduction: Renal diseases in children can be congenital or acquired. In Bangladesh, pediatric nephrology care is available for last 2 decades, but there was no epidemiological study to see the pattern and factors of renal diseases in children of the country. So, this study was carried out to observe the pattern and factors of renal diseases in children of pediatric nephrology centers of Dhaka city. **Objective**: This study was conducted to find out the pattern and factors of renal diseases among children admitted in a tertiary level hospital (Dhaka Shishu Hospital), Dhaka, Bangladesh. **Methods**: A retrospective cross sectional study was conducted for a period of four months using data was collected from the Secondary data. **Results**: In an inpatient department among 41 patients, 22(52.50 %) were male and 19 (47.50%) were female. Most common renal disease, Nephrotic syndrome were 23 (55%), Chronic Kidney Disease 6 (15%), Glomerulonephritis 3 (7.5%) and Acute Kidney Injury 5 (12.5%). Other less common renal disorders include Obstructive Uropathy and Urinary Tract Infection were 2 (5%) respectively. Common symptom were edema (37.5%), oliguria or anuria (27.5%) and proteinuria (25%). Most common pattern of patients were Minimal Change Disease (MCD) 13 (32.5%), Focal Segmental Glomerulosclerosis (FSGS) 11 (27.5%) and Membranous Nephropathy 6 (15%) respectively and most common factors birth defect and hereditary disease 90%. **Conclusion**: The current pattern of renal diseases shows that the most common renal diseases are NS followed by CKD and UTI and most common pattern of IPD patients were MCD then FSGS and most common factors birth defect and hereditary disease. In the study, male patients are more common than female.

Key Words: *Factors association, Renal Disease, Pediatric Nephrology.*

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INTRODUCTION

The pattern of pediatric kidney diseases varies according to genetic, racial, environmental differences as well as geographical locations. Spectrum of pediatric renal diseases start from Congenital Anomalies of Kidney and Urinary Tract (CAKUT) such as obstructive uropathy and other congenital urological manifestations to acquired kidney disorders such as Glomerulonephritis, renal stone diseases and urinary tract infections[1]. Children with congenital disorders of urinary tract have a slower progression to Chronic Kidney Disease (CKD) in comparison with Glomerulonephritis, resulting in lower proportion of CAKUT in the ESRD population, compared to less advanced stages of CKD[2]. Moorani et al. were Nephrotic Syndrome (49.3%), CKD (28.7%), urinary stone disease (4%), and obstructive uropathy (3.5%)[3]. There is epidemiological evidence of higher incidence of Nephrotic Syndrome (NS) in children from south Asia[4,5,6]. But there is limited information on the epidemiology of CAKUT. By knowing the spectrum of CAKUT and their clinical manifestations, we can address this group of patient early. Early management of congenital disorders can delay the progression CKD as well as prevent CKD. In Bangladesh, data regarding pediatric kidney diseases are scanty due to absence of a national registry. Earlier, a study from a district hospital reports, about 4.4% of hospital admission were due to renal related problems. But study on adult population shows 16-18% patients were CKD and Glomerulonephritis (35%), Diabetes Mellitus (37%) and Hypertension (13%) were the common etiologies. Pediatric nephrology is a new sub specialty in Bangladesh and a few centers are established, among them 4 centers are in Dhaka city, those are referral centers also. Renal replacement therapy is available in the form of peritoneal dialysis and hemodialysis in all 4 centers, but renal transplantation for children is available only in one center (Bangabandhu Sheikh Mujib Medical University).

So, an audit of renal diseases in children may provide data that could guide the planners to prevent ESRD. Several studies have so far been done on various aspects of NS, obstructive uropathy, Acute Renal Failure and CKD, but exact pattern of renal diseases in children is yet to be known. Therefore, we have planned to study retrospectively in selected 4 centers of Dhaka city to see the pattern of renal diseases in children[7].

Methodology

A retrospective cross sectional study was conducted to find out the pattern and factors of renal diseases among children admitted in a Dhaka Shishu Hospital from November 2020 to February 2021. Children and adolescent of 1 day to 12 years of age admitted in renal ward during data collection period was included. Data was collected from the Secondary data by registry book kept in IPD. Data including age, gender, weight and height, clinical findings was collected on a structured perform and analyzed using Statistical Package for Social Science (SPSS) version 16. The analyzed data was presented in tables, graphs, charts and bars. Descriptive statistics was used for the interpretation of the finding.

Results

Total 41 patients were selected by hospital record book. All the findings obtained from the study are presented mainly by using different types of tables and graphs. Of the 41 patients selected, Patients were predominantly female 19 and male 22.

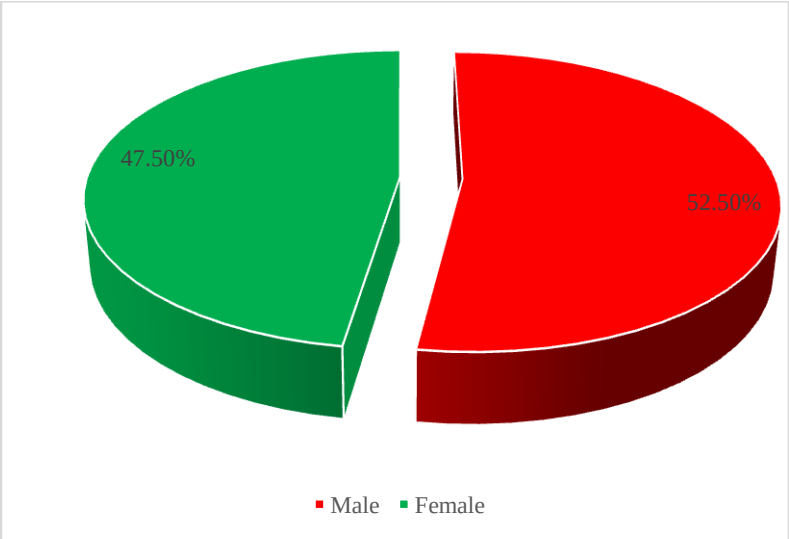

Figure-1: Distribution of the patient according to their Gender.

Table-1: Distribution of patient according to age (n=41)

Age (in years)	Number(n)	Percentage (%)
<1	6	15%
1-5	11	27.5%
5-12	24	57.5%
Total	**n=41**	**100%**

Among 41 patients, <1 years of age were 15% (6), 1-5 years of age were 27.5% (11), 5-12 years of age were 57.5% (24). The mean age was 4.41±3.5 years.

Table-II: Distribution of patient according to pattern of renal diseases (**n=41)**

Type of renal diseases	**Number(n)**	**Percentage (%)**
Nephrotic syndrome	23	55%
Chronic Kidney Disease	6	15%

Glomerulonephritis	3	7.5%
Acute Kidney Injury	5	12.5%
Obstructive Uropathy	2	5%
Urinary Tract Infection	2	5%
	n=41	**100%**

Table shows, pattern of renal diseases in IPD patient. It was found that out of 41 patients with renal disease, Nephrotic syndrome were 23 (55%), Chronic Kidney Disease 6 (15%), Glomerulonephritis 3 (7.5%) and Acute Kidney Injury 5 (12.5%). Other less common renal disorders include Obstructive Uropathy 2(5%) and Urinary Tract Infection were 2 (5%) respectively.

Table–III: Distribution of patient according to sign and symptoms of renal diseases (n=40)

Sign and symptoms	**Number(n)**	**Percentage (%)**
Edema or swelling of body	15	37.5%
Oliguria or Anuria	11	27.5%
Proteinuria	11	25%
Abdominal Pain	3	7.5%
Hematuri	1	2.5%
	n=41	**100%**

Table showed that, presenting features of admitted patients with renal disease in this study. Most common presentation of IPD patients were edema or swelling of body (37.5%). Other presenting features were oliguria or anuria (27.5%), proteinuria (25%), abdominal pain (7.5%). Other important presenting features were hematuria (2.5%).

Table-IV: Distribution of patient by factors of renal diseases (n=40)

Factors of Renal diseases	**Number(n)**	**Percentage (%)**
Minimal Change Disease(MCD)	13	32.5%
Focal Segmental Glomerulosclerosis (FSGS)	11	27.5%
Membranous Nephropathy	6	15%
Other Glomerulonephropathy	11	25%
	n=41	**100%**

Table showed that, factors of admitted patients with renal disease in this study. Most common factors of IPD patients were Minimal Change Disease (MCD) 13 (32.5%), Focal Segmental Glomerulosclerosis (FSGS) 11 (27.5%) and Membranous Nephropathy 6 (15%) respectively.

DISCUSSION

This study highlights the epidemiology of renal diseases in children managed at Dhaka Shishu Hospital of Dhaka city. The most common renal disease requiring admission in pediatric nephrology ward was Nephrotic Syndrome (NS) accounting 862 (76%), which was similar to other studies. Chronic Kidney Disease accounting 70 (6%) and Acute Kidney Injury (AKI) accounting 67 (5.9%) were next two common diseases. Primary NS has been reported as the most common renal disorder in pediatric population from all over the world. Its frequency varies from 18.5% to 60% in different studies from various geographical regions. In this study Nephrotic Syndrome was found more common in male and male to female ratio was 1.8:1, which corresponds with previous studies[8,9,10]. CKD was found as the second most common renal disease in hospital admission (6%) in this study. Similar results were found in the study from Nepal[11]. We found that obstructive uropathy (n=34, 48.5%) and glomerulonephritis (n=24, 34%) were two common etiologies of

CKD in this study followed by renal hypoplasia and dysplasia (n=08, 11.4%). Study from neighboring country shows, most common etiologies were renal hypoplasia-dysplasia and urinary stone disease. Data from European countries and North America shows similar results; most common etiologies were CKAUT and obstructive uropathy[12,13]. Studies from Mid Asian region shows, congenital urological malformations were more common. According to North American Pediatric Renal Trials and Collaborative Study (NAPRTCS, 2014) data, renal aplasia/ hypoplasia/ dysplasia (15.8%) was the most common etiology of CKD followed by obstructive uropathy (15.3%) and Focal segmental Glomerulosclerosis (11.7%)[13,14,15]. However, it is consistent with USRD annual data report 2014. So, studies from different geographical region shows, congenital urological malformations were the main etiology of CKD[16,17]. Our study shows, similar results also. It was also observed that, most of the patients in this study presented as ESRD (57%), the reason may be all the study centers are tertiary care centers. We found CAKUT in 61(5.4%) patients in this study. CAKUT was about 30% in all the prenatally diagnosed congenital malformations and it is also responsible for more than 50% causes of CKD. In this study we found, CAKUT was the etiology of more than 60% cases of CKD and most common diagnosis was obstructive uropathy (48.5%), then renal hypoplasia-dysplasia (11.4%). But in a study from National Institute of Child Health (NICH), Karachi, Pakistan, they found >85% cases are CAKUT among the etiologies of CKD, where renal hypoplasia-dysplasia was 43%[18]. The reason of these etiological variations in our study may be the CKD cases were presented to hospital in later stage. So, early stages of CKD and CAKUT were remaining undiagnosed in the community. Glomerulonephritis (6%) was found the third most common disorder in this study. There were 69 cases of Glomerulonephritis, among them, acute post streptococcal Glomerulonephritis was most common followed by Lupus Nephritis, Henoch Schonlein Purpura and IgA Nephropathy. Study from NICH shows, similar results but percentages of Glomerulonephritis was higher in the study from Pokhara, Nepal[11]. Other studies from different regions of Africa show similar results[19-23]. The frequency of Acute Kidney Injury (5.9%) was higher than studies from neighboring countries. Urinary tract infection was found 2% in admitted patients but it was 9.4% in OPD patients. It may be due to UTI patients were treated at OPD and complicated UTI patients were only admitted.

CONCLUSION

This study identifies the current pattern of renal diseases in children in pediatric nephrology centers of Dhaka city. Nephrotic syndrome is the most common disease, followed by chronic kidney disease and urinary tract infection. Hereditery where Minimal Change Disease (MCD) is the most common factors of renal disease in children than Focal Segmental Glomerulosclerosis (FSGS). It has been found that, boys were presented more commonly than girls in this study.

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