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Research Article

Renal Diseases

The Spectrum of Biopsy Proven Renal Diseases among Children- A Single Centre Study

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Introduction: The burden of different renal diseases among children in developing countries is limited due to the absence of a specific registry. In several locations, single or multicenter data on kidney biopsies help to fill this gap. **Aim:** This study aims to evaluate the histopathological pattern in the south Indian paediatric population in a tertiary care centre. **Methods:** It is prospective hospital-based research done between the years 2019 to 2021 in 41 cases of less than 14 years of age group. **Results:** Present study population had a mean age of 72.7 months, with a male predominance. The most common indication for renal biopsy was Steroid Resistant Nephrotic Syndrome, and minimal change disease was the most common histopathological diagnosis by Renal biopsy. **Conclusion:** This study emphasizes the significance of establishing a regional registry for pediatric renal illness.

Keywords: Renal biopsy, Minimal change disease, FSGN

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Introduction

Globally with an annual incidence rate of 8%, renal disease is becoming a common problem among children [1]. The burden and pattern of renal disease among children in developing countries like India are unknown. Furthermore, there is evidence of a recent shift in the Spectrum of renal illnesses in various regions of the world [2]. Renal biopsy is a well-known diagnostic method for evaluating kidney disorders in children. The disorders discovered on percutaneous renal biopsies vary widely based on various parameters, including age, gender, race, geographic location, and the type of the biopsy reasons. Country-based renal biopsy registries exist in many regions of the world, but no such policy is seen in India [3-5]. In India, a few hospital-based studies [6,7]. have been conducted, but there is little information available on the population of South India.

Aim

This study aims to investigate the indications of renal biopsy in the south Indian paediatric population, to evaluate the histopathological pattern in a tertiary care centre.

Methodology

The present study is a descriptive prospective hospital-based study. We looked at renal biopsies conducted at a single centre NRI medical college and general hospital in children under 14 from January 2019 to August 2021. Pediatric nephrologists used 18-gauge renal biopsy needles to perform all of the biopsies under ultrasound supervision.

Sample size: 41 cases under the age of 14 were included in the study. Prior consent was taken from guardians of the study population.

All data, including age, gender, indication for kidney biopsy, and histological diagnosis, was recorded after the study was approved by the Institutional Ethical and Review committee. After blood work, an interventional radiologist did ultrasound-guided kidney biopsies under general anesthesia. Before and immediately after the biopsy, all patients had a renal ultrasound, and the children were monitored for vital signs and any changes in urine colour or volume. All of the patients had a Follow-up hemoglobin test after 6–24 hours. The patients were discharged the next day with stern orders to refrain from strenuous exercise for a week. One renal pathologist analyzed the majority of the samples.

Results

A total of 41 cases were included in this study. The majority study population were in less than 5 years age group (51.2%). The mean age was 72.7 months (6 years).

More than half of the study populations were boys (56.1%). (Table No.1)

Table 1: Age and Gender Distribution.

Variables		N	N %
Age Categories In Years	Less Than 5	21	51.2%
	5 TO 10	10	24.4%
	11 TO 15	10	24.4%
Gender	Female	18	43.9%
	MALE	23	56.1%

Steroid Resistant Nephrotic Syndrome was the most common (46.3%) indication followed by Rapidly Progressive Glomerulonephritis (22%) followed by Infantile Onset Nephrotic Syndrome (19.5%) for renal biopsy.

There were two cases of Steroid Dependent Nephrotic Syndrome and each case of Acute Glomerulonephritis, Hypertensive Encephalopathy, and Nephro Nephritic Syndrome were present as an indication for renal biopsy. (Table No.2)

Table 2: Indication of Renal Biopsy Distribution.

Indication	N	N %
Steroid Resistant Nephrotic Syndrome	19	46.3%
Rapidly Progressive Glomerulonephritis	9	22.0%
Infantile Onset Nephrotic Syndrome	8	19.5%
Steroid Dependent Nephrotic Syndrome	2	4.9%
Acute Glomerulonephritis	1	2.4%
Hypertensive Encephalopathy	1	2.4%
Nephro Nephritic Syndrome	1	2.4%

In the present study, renal biopsy showed minimal change disease (46.3%) as the most frequent histopathological diagnosis, followed by Post Infectious Glomerulonephritis (19.5%), followed by Focal Segmental Glomerulo Sclerosis (12.2%) followed by Membranous Nephropathy (7.3%). (Table No.3)

Table 3: Renal Biopsy Diagnosis Distribution.

Biopsy Diagnosis	N	N %
Minimal Change Disease	19	46.30%
Post Infectious Glomerulonephritis	8	19.50%
Focal Segmental Glomerulo Sclerosis	5	12.20%
Membranous Nephropathy	3	7.30%
Membrano Proliferative Glomerulonephritis	2	4.90%
Diffuse Mesangial Sclerosis	1	2.40%
Ig A Nephropathy	1	2.40%
Ig A Vasculitis	1	2.40%
Thrombotic Angiopathy	1	2.40%

Discussion

This research provides the frequency of 'Biopsy proved renal diseases' among children in the south Indian population over two and half years. The majority were males and below five years in the study population (mean age -6 years). Anochie I et al. [8] and Rahman MH et al. [9] also had similar male predominance in renal diseases among children. Al-Sadoon EI et al. [10] did a similar in Saudi Arabia, which showed 7.3 years as the mean age, almost similar to the present study. Mohapatra A et al. [11] did a similar study on the South Asian population where it showed 12.8 years which is way higher than the present study's mean age. Gender distribution was similar to other studies done in Brazilian, Serbian, and Korean studies [12-14]. The differences in gender may be due to the gender-based discrimination of health-seeking present in developed countries like India.

Steroid Resistant Nephrotic Syndrome was the most common indication for renal biopsy in the present study. A similar study done in North India by Kanodia KV et al [15]. had similar frequent indications (Nephrotic syndrome -46.2%) in their study which supports the present study. A Chinese study was done by Nie S et al [16]. also had Nephrotic syndrome had the main indication (50%) for renal biopsy in their child study population.

In a study done in Saca, Edward et al [17]. also had steroid-resistant nephrotic syndrome accounting as the main indication for biopsy in their study which supports the present study. Saudi Arabian study by Al-Sadoon EI et al [10]. also had nephrotic syndrome in 58.9% as an indication.

Minimal change disease (46.3%) is the most frequent histopathological diagnosis in the present study.

Table No.4 Comparison of Various Similar Studies Done Around the World with the Present Study.

Study	Country	Study Period	Common Diagnosis
Present Study	South India	2019-2021	Minimal Change Disease
Clement Wilfred Devadass et al. [18]	South India	2008-2013	Primary Glomerulonephritis
Mohapatra A et al. [11]	South India	1996-2015	Minimal Change Disease
Kanodia KV et al. [15]	North India	2008-2013	Primary Gn Included Mesangial Proliferative Gn (MEPGN)
Al-Sadoon EI et al. [10]	Saudi Arabia	2008-2018	Minimal Change Disease
Khalid Alhasan et al. [19]	Saudi Arabia	1998-2018	Focal Segmental Glomerulosclerosis And Minimal Change Disease
Ruimin Hu et al. [20]	China	2009-2018	IGA Nephropathy
Sheng Nie et al. [16]	China	200-2014	Minimal Change Disease
Reem Hadidi et al. [21]	Jordan	2006-2012	Minimal Change Disease
Saca, Edward et al. [17]	Jordan	1999-2003	Focal Segmental Glomerulosclerosis
Printza N et al. [22]	Greece	2003 - 2009	Focal Segmental Glomerulosclerosis
Batinić D et al. [23]	Croatia	1991-2004	Focal Segmental Glomerulosclerosis
Choi et al. [24]	Korea	1973-1995	Minimal Change Disease

Table no. 4 shows various Indian studies with Minimal Change Disease as the most frequent diagnosis at renal biopsy. On the other hand, other countries like China [16], Jordan [21], and Korea [18] also had the same common diagnosis as the present study.

Focal Segmental Glomerulosclerosis appears to be the most common diagnosis of renal biopsy in various countries like Saudi Arabia [19], Jordan [17], Greece [22], Croatia [23], and Korea [18].

Summary: Present study had very young children (less than five years) with a mean age of 72.7 months.

The most common indication for renal biopsy was Steroid Resistant Nephrotic Syndrome.

The most common histopathological diagnosis by Renal biopsy was minimal change disease.

Conclusion

Our centre's renal disease distribution in the pediatric age group is comparable to that documented in other nations, with minor variances. Given the scarcity of trustworthy data in India, this study emphasizes the significance of establishing a regional registry for pediatric renal illness.

What does this study add? This study adds information about biopsy-proven renal diseases among south Indian children. However, as a single-centre study, the enrolled patients mostly came from coastal regions and may not represent the south Indian population as a whole.

Contribution: All authors contributed equally to manuscript preparation and approved the manuscript.

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