



Indications for Renal Biopsy in Iraqi Children With Glomerular Diseases

KEYWORDS

Renal biopsy, nephrotic syndrome.

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ABSTRACT *Background: Renal biopsy is a basic tool in renal tissue analysis. Many are the indications for renal biopsy in paediatric patients which may vary between different nephrology centers.*

Objectives: To study the main indications for performing renal biopsy in Iraqi children with glomerular diseases.

Subjects, materials and methods: Analysis was done for a 10 years period records of 200 Iraqi paediatric patients who underwent percutaneous renal biopsy, collected from three different Paediatric nephrology centers in Baghdad.

Results: Out of 200 patients, 110 were males and 90 were females. The mean age was 7.8 years + standard error (SE) of 4.1 years and a range from 6 months to 17 years. The most frequent indication for renal biopsy was nephrotic syndrome reported in 69% of the patients.

Conclusions: Nephrotic syndrome was the main indication for performing renal biopsy at the Paediatric Nephrology Centers in Baghdad.

Introduction:

The gold standard for renal tissue analysis is the renal biopsy. It is routinely performed to allow the proper diagnoses of renal diseases and to determine the extent of damage in native and allograft kidneys.¹ Renal biopsy is now able to provide a tissue diagnosis in more than 95% of cases with a life threatening complication rate of less than 0.1%.² Patients with renal disease often present with nephrotic syndrome (NS), acute kidney injury (AKI), or chronic kidney disease (CKD) which are merely patterns of kidney disease that can have many causes. To aid the management of such patients, the histological analysis of a renal biopsy sample should therefore aim to identify a specific diagnosis, reflect the level of disease activity and provide information to allow informed decisions about treatment.³ The indications for performing a renal biopsy may vary among nephrologists, determined in large part by the presenting signs and symptoms. Isolated glomerular hematuria, non-nephrotic proteinuria, nephrotic syndrome, acute nephritic syndrome, unexplained acute renal failure, chronic renal failure, rapidly progressive glomerulonephritis, familial renal disease, systemic disease with renal dysfunction and renal transplantation are the main indications for renal biopsy.^{4,5,6,7,8}

This study aims to study the indications of renal biopsy in Iraqi paediatric patients and to compare these findings with reports from other countries.

Patients, materials and Methods:

In this cross sectional retrospective study, analysis of the indications for 200 percutaneous renal biopsies at tertiary paediatric nephrology centers was done, 96 biopsies were from Al-Karama teaching hospital, 68 biopsies from Central Child teaching hospital and 36 biopsies were from Children Welfare teaching hospital. All the selected renal biopsies were performed in the period between the 1st of January 2004 to the 31st of December 2013 and collected over 3 months duration. The patients' clinical information (age,

sex, clinical features) in addition to the laboratory findings were carefully documented from the patients' records. All the results were analyzed and calculated using the Statistical Package for the Social Sciences (SPSS) 19.0 software and the Microsoft Office Excel software 2007. Only P values less than 0.05 were considered statistically significant.

Results:

Among 200 patients there were 110 (55 %) males and 90 (45 %) females. Male to female ratio (M: F) was 1.22:1. The age ranged from 6 months to 17 years with a mean age of 7.8 years \pm SE of 4.1 years and median age of 8 years. .

Renal biopsy was more encountered at the age group of less than 6 years old with a frequency of 70 cases (35%) 44 while the least frequency was found in the age group of 16 – 17 years old being only 8 cases (4%). There was no statistical significant association between gender and mentioned age group ($p > 0.05$).

Table (1) Distribution of patients according to age and gender.

Age group (years)	Males frequency	Female frequency	Total frequency	Total %
< 6	44	26	70	(35 %)
6 – 10	34	31	65	(32.5 %)
11 – 15	27	30	57	(28.5 %)
16 – 17	5	3	8	(4 %)
Total	110	90	200	(100 %)

In the current study, the most frequent indication for renal biopsy was nephrotic syndrome (specifically steroid resist-

ant) while the least frequent one was isolated proteinuria.

Table (2) Indications for renal biopsy.*

Indication	NS					Acute nephritic syndrome	Isolated haematuria	Isolated proteinuria	Systemic disease associated with renal impairment
	Atypical		Steroid dependant	Steroid resistant	Frequent relapse				
	Age ≤ 1 year	Age > 10 years							
Frequency	11	30	9	92	38	15	20	4	25
Percentage	8%	21.7%	6.5%	66.7%	27.5%	7.5%	10%	2%	12.5%
Total	138 (69%)								

* Patients may present with more than one indication.

The most frequent clinical manifestation was oedema observed in 92.5 % of the cases while the most frequent laboratory abnormality was proteinuria in 96 % of the cases ($P > 0.05$).

Table (3) Clinical and biomedical parameters of the patients. *

Parameter	No. of patients	Relative percentage
Oedema	185	92.5 %
Macroscopic hematuria	30	15 %
Hypertension	63	31.5 %
Systemic manifestations	48	24 %
Renal impairment	35	17.5 %
Microscopic hematuria	123	61.5 %
Proteinuria	192	96 %
UTI	75	37.5 %
Haematological abnormalities	19	9.5 %
Serological abnormalities	33	16.5 %

* Patients may present with more than one clinical or laboratory manifestation.

Discussion:

This review provides information about indications of renal biopsy over a period of 10 years covering three Paediatric Renal Centers in Baghdad. Out of 200 renal biopsies were included in this study, (55%) were for male patients and (45%) were for female patients. Male to female ratio was

1.29:1. These findings go with a study done in Czech in 2004⁹, showed out of 710 patients, (53.2%) of the paediatric patients were males and (46.8%) were females. In contrast to a previous Iraqi study published in 2010¹⁰, out of 100 patients, males were (70%), females were (30%) and male to female ratio was 2.3: 1. Possibly, that variance could be elucidated by the difference in the sample size between these studies. At the time of diagnosis the age of the patients ranged from 6 months to 17 years. The median age was 8 years. This was to some extent similar to the findings of the same mentioned Iraqi study¹⁰, with age ranged from 1 month to 15 years and a median age of 7.5 years. Mean age of the patients was 7.8 years, which is slightly lower than that was reported in the Czech study⁹ where the mean age was 10 years; this maybe due to ethnic variations between Iraqi and other countries populations. The most frequent age group was the (< 6 years) group, like what was mentioned in the same Iraqi study¹⁰.

The main indication for renal biopsy in the current study was nephrotic syndrome reported in 138 patients out of the 200 patients (69%), 92 of them presented with steroid resistant nephrotic syndrome. That was to some extent comparable to the findings of a Jordanian study in 2007¹¹, a study conducted in Greece in 2011¹², a Spanish study in 2008¹³, a Serbian study in 2012¹⁴ and a study in Pakistan¹⁵ where nephrotic syndrome was the main indication for performing renal biopsy in these studies and was found in 39.6%, 34.5%, 37.3%, 32.3% and 50% of the patients, respectively. Unlike a British study in 2009¹⁶, isolated proteinuria was the predominant indication for doing renal biopsy in 36% of the patients. A Korean study in 2008¹⁷ reported systemic disease with renal impairment as the main indication for performing renal biopsy and was found in 34% of the patients.

These variable frequencies could be explained by that different centers may have different selection criteria for doing renal biopsy for patients with renal abnormalities, thus, variances in the frequencies may occur.

Conclusion:

Results illustrated that nephrotic syndrome was the main indication for performing renal biopsy at the paediatric nephrology centers in Baghdad.

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