CLINICAL AND HISTOPATHOLOGICAL EVALUATION OF KIDNEY BIOPSY SAMPLES

Recep Demirci[1] ID**, Berrak Sahtiyancı[2]** ID**, Ali Bakan[3]** ID**, Okan Akyuz[4]** ID**, Yasemin Özlük[5]** ID**,
Işın Kılıçaslan[6]** ID

[1,2]MD, [3]Assoc. Prof., Department of Nephrology, University of Health Sciences Kanuni Sultan Suleyman
Training and Research Hospital, Turkey

[4]MD, Department of Nephrology, Bilecik State Hospital, Bilecik, Turkey

[5]MD, [6]Prof. Department of Pathology, Istanbul University Istanbul Faculty of Medicine, Istanbul, Turkey

ABSTRACT

The aim of this study was to evaluate the clinical and pathological evaluation of renal biopsies performed between
January 2015 and December 2019. In this study, renal biopsy data of 64 patients who were performed in the
Internal Medicine Clinic of Kanuni Sultan Suleyman Training and Research Hospital between January 2015 and
December 2019 were analyzed retrospectively. All renal biopsies were performed under ultrasonography guidance
and all were native kidney biopsies. Demographic, clinical and laboratory data of the patients were obtained from
hospital records. The study group consisted of 26 (41.2%) males and 38 (58.8%) females with a mean age of 44.41
± 8.55 years. In the study, nephrotic proteinuria and hematuria were the most common biopsy indications (65.1%).
Biopsy revealed the most common focal segmental glomerulosclerosis (FSGS) (29.7%) and followed membranous
glomerulonephritis (MGN) (20.4%). In conclusion, the most common indication for biopsy was nephrotic
proteinuria and hematuria. It was noteworthy that the most common pathology detected by biopsy was FSGS.

Keywords: focal segmental glomerulosclerosis, membranous glomerulonephritis, renal

BÖBREK BİYOPSİ ÖRNEKLERİNİN KLİNİK VE HİSTOPATOLOJİK AÇIDAN DEĞERLENDİRİLMESİ

ÖZET

Bu çalışmada Ocak 2015 ve Aralık 2019 tarihleri arasında yapılan böbrek biyopsilerinin klinik ve patolojik açıdan
değerlendirilmesi amaçlandı. Bu çalışmada Ocak 2015- Aralık 2019 tarihleri arasında Kanuni Sultan Süleyman

Eğitim ve Araştırma Hastanesi İç Hastalıkları Kliniğinde yapılan 64 hastanın böbrek biyopsi verileri retrospektif olarak analiz edildi. Böbrek biyopsilerinin hepsi ultrasonografi eşliğinde yapılmış olup tamamı nativ böbrek biyopsisiydi. Hastalara ait demografik, klinik ve laboratuvar bilgileri hastane kayıtlarından elde edildi. Çalışma grubunun 26'sı (%41.2) erkek, 38'i (%58.8) kadın olup yaş ortalaması 44.41 ± 8.55 yıl idi. Çalışmada biyopsi endikasyonları arasında ilk sırada nefrotik düzeyde proteinüri ve hematüri (%65.1) bulunuyordu. Biyopsi sonucunda en sık fokal segmental glomerüloskleroz (FSGS) (%29.7) saptanırken ikinci sırada ise membranöz glomerülonefrit (MGN) (%20,4) saptandı. Sonuç olarak çalışmada en sık biyopsi endikasyonu nefrotik düzeyde proteinüri ve hematüri olarak saptandı. Biyopsi sonucunda en sık saptanan patolojinin FSGS olması dikkat çekiciydi.

Anahtar Kelimeler: böbrek biyopsisi, fokal segmental glomeruloskleroz , membranöz

INTRODUCTION

Renal biopsy is an important diagnostic tool in many subjecys, including the exact diagnosis of renal parenchymal diseases, the degree of active or chronic changes in kidney diseases, the prognosis and the likelihood of response to treatment, and also to assist in the evaluation of genetic diseases (1-3).

Routine evaluation of renal biopsy involves examining tissue under light, immunofluorescence, and electron microscopy, and each component of the evaluation can provide important diagnostic information (2). As with any biopsy procedure, sufficient tissue and sufficient glomeruli are vital for clear pathological diagnosis in renal biopsies. As it is an interventional procedure, bleeding complications such as hematuria and perinephric hematoma can be seen, but these complications are low in renal biopsies (4). Especially, the frequency of major complications is very low in renal biopsies performed with automatic or semi-automatic needles accompanied b ultrasonography (USG) (5).

The evaluation of renal biopsies performed with the USG will provide information on the most common kidney pathologies, especially the complications of biopsy and the result of biopsy. Although some studies have been carried out in our country, a limited number of studies have been found (6-9). In our study, it was aimed to evaluate the renal biopsies performed between January 2015 and December 2019 in terms of clinical and pathology.

MATERIALS AND METHODS

Study population

In this study, renal biopsy data of 64 patients who were performed between January 2015 and December 2019 t Kanuni Sultan Suleyman Training and Research Hospital Internal Medicine Clinic were analyzed retrospectively. Demographic, clinical and laboratory information of the patients was obtained from hospital records. Approval was obtained from the ethics committee of Istanbul University Haseki Training and Research Hospital for this study (KAEK/2019.02.33).

Biopsy

All renal biopsies were performed using a 16G automated biopsy needle with USG. All kidney biopsies included in the study were native kidney biopsies.

Pathological examination

Samples obtained as a result of kidney biopsy were put in Petri dishes in saline gauze. Ice molds were placed around the boxes and samples were delivered to Istanbul Medical Faculty Department of Pathology as soon as possible. Samples were examined under a light and immunofluorescence microscope. For light microscope examination, 2 Lam Hematoxylin and Eosin (HE), 2 lam Periodic-Acid-Schiff (PAS), 1 Lam Masson Trichrome were stained with 1 lam Periodic-Acid-Silver Methanamine (PAS-M) and 1 lam Congo Red. For immunofluorescence examination, sections were taken from shock-frozen tissues using liquid nitrogen and stained directly with IgG, IgA, IgM, C3, C1q and fibrinogen antibodies. At least 10 glomeruli in the sample were considered as sufficient biopsy samples.

Statistical Analysis

IBM SPSS (v20) statistical package program was used to evaluate the data. Descriptive statistics were given as percentages and average. Continuous variables were given as mean±standard deviation and categorical variables as frequency (percent).

RESULTS

The study group consisted of a total of 64 patients, 26 (41.2%) male and 38 (58.8%) female. The mean age of the patients was 44.41 ± 8.55 years. Among the biopsy indications in the study, proteinuria and hematuria (65.1%) were in the first place at the nephrotic level. Other indications were isolated proteinuria and unexplained fast-moving kidney damage. As a result of biopsy, focal segmental glomerulosclerosis (FSGS) (29.7%) was the most common, while the second place was diagnosed as membranous glomerulonephritis (MGN) (20.4%) (Table 1). No major complication developed in any patient included in the study. In 6% of patients, minor complications such as minor bleeding and hematoma, which did not require minor intervention, developed.

Table 1. Basic features of patients

	n= 64	%
Gender		
Male	26	41.2
Female	38	58.8
Biopsy indication		
Nephrotic proteinuria and hematuria	42	65.1
Isolated proteinuria		
Rapidly progressive kidney damage of unknown cause		
Diagnoses		
Focal segmental glomerulosclerosis	19	29.7
Membranous glomerulonephritis	13	20.4
IgA nephropathy	9	14.1
Amyloidosis	7	10.9
Crescentric glomerulonephritis	3	4.7
Diabetic nephropathy	2	3.1
Malignant nephrosclerosis	2	3.1
C3-associated nephropathy	1	1.5
Normal findings	8	12.5

DISCUSSION

In this study, the results of kidney biopsy, known as the gold standard in the diagnosis and treatment of kidney diseases, were evaluated.

Indication for kidney biopsy varies depending on the regions where the studies are performed or whether there are single-center or multi-center studies. However, in most studies, proteinuria is the most common indication for biopsy (8, 10-12). In our study, the most common indication for biopsy was nephrotic proteinuria and hematuria (65.1%). The value we identified was generally higher than the rates found in the literature.In our study, the combined evaluation of proteinuria and hematuria at nephrotic level may have resulted in this result. In the study conducted by Akarsu *et al*., which reported very close results to our study in a proportional manner supporting this result, it was reported that the most common indication of kidney biopsy was proteinuria and hematuria (68.6%) at nephrotic level (8).

In studies, very different results have been reported about the most common pathologies as a result of biopsy. In a very wide-ranging study in which 4200 patients were evaluated between 1998 and 2018, it was reported that MGN (25.4%) was the most common pathology after biopsy and FSGS (13%) was the second most common (10). In a study conducted by Zink *et al*, which evaluated 1208 biopsies over a 24-year period, the most common pathology was IgA nephropathy (34.7%) (13). Another study evaluated 818 patients and reported the most frequent mesengial proliferative glomerulonephritis (34.5%) and the second most frequent IgA nephropathy (14). Considering the studies conducted in our country, it was stated that in a large-scale study in which 25 centers were included in the study and 1274 biopsies were evaluated, the most frequent MGN (28.8%) was FSGS (19.3%) (9). In the study conducted by Akarsu *et al*. (8), the most common was MGN (22.9%), in the study of Ecder *et al.* (7), the most common was IgA nephropathy (11.9%), and in the study of Pişkinpaşa *et al*. (15), the most common was MGN (16% 4). In our study, it was found that the most common pathology was FSGS (29.6%) and MGN (20%) was the second most common result of kidney biopsy. Although most of the studies in our country reported that the most common pathology is MGN, similar to our study, there are also studies that report that FSGS and MGN are the second most frequent (16). In addition, in a recent study evaluating kidney biopsy results over a 24-year period, FSGS has been reported to increase significantly over the years, although the most common pathology

was reported to be IgA nephropathy (13). The most common pathologies both in the world and in our country are highly variable. The biopsy is usually based on the individual decisions of the expert who will perform the biopsy or on a single center policy.

In addition, cardiac evaluation of patients who are scheduled for renal biopsy can sometimes be considered. Because it is cardiac asymptomatic and may be accompanied by underlying heart diseases. Studies have shown that there may be cardiac valve calcifications, systolic-diastolic dysfunctions, and disorders of right heart functions, especially in kidney disease patients (17,18). We think that suspicious patients who may think about cardiac pathology should be performed in electrocardiographic and echocardiographic evaluation before biopsy.

As a result, the lack of consensus on the true indications of biopsy may have led to very different results. Establishing a standard for kidney biopsy indication will give more accurate results in comparison of detected pathologies.

There were some limitations in our study. Firstly, the data in the study are obtained by retrospectively screening the hospital records. Secondly, being a single center study and relatively low number of cases can be counted as a limitation. Finally, the results have some degree of prejudice in this sense, as there may be patients who have refused the biopsy due to complications.

CONCLUSION

In our study, the most common indication of biopsy was proteinuria and hematuria at nephrotic level. It was noteworthy that the most common pathology found as a result of biopsy was FSGS. In general, MGN, which was found more frequently in the literature, was found in the second frequency in our study. Extensive and long-term studies on this subject will provide a clearer understanding of the trend in the most common pathologies.

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