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ORIGINAL ARTICLE

A Cross-Sectional Study on Histological Pattern of Primary Glomerular Diseases among Adult Patients

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ABSTRACT

Background and Aims: Primary glomerulonephritis (GN) is the major cause for end-stage renal disease (ESRD) and considered to contribute in 52% cases. Kidney biopsy is an essential tool in nephrologists' clinical practice for determining diagnosis, prognosis, and therapy of a variety of glomerular conditions. The purpose of the present study was to determine the primary glomerular diseases histopathological pattern among adult patients.

Patients and Methods: A total of 94 suspected primary glomerular disease (GD) patients were investigated in this cross-sectional study conducted in the Nephrology Unit of Medicine department of Mayo Hospital, Lahore from 21st January 2021 to 20th February 2022. Individual's demographic details, diagnostic tests, clinical presentation, kidney biopsy indications, and post-biopsy complications were recorded on pre-designed questionnaire/pro-forma. Data analysis was done using SPSS version 27.

Results: Out of 94 patients, about 76 (80.9%) patients had primary glomerular disease diagnosed on native kidney biopsies. The overall mean age was 38.4± 6.2 years. Out of 94 primary glomerular disease patients, there were 48 (51.1%) male and 46 (48.9%) females. The incidence of nephrotic syndrome and unexplained renal parameters elevations were 47.4% (n=36) and 31.6% (n=24) respectively. The prevalence of Primary focal segmental glomerulosclerosis (FSGS), membrano-proliferative glomerulonephritis (MPGN), minimal change disease, and IgA nephropathy was 30.3% (n=23), 25% (n=19), 17.1% (n=13), and 6.6% (n=5) respectively. Kidney biopsy post-complications were found in 8 (10.5%) cases.

Conclusion: The present study observed that MPGN and FSDS were the most prime causes for primary glomerular disease. The most prevalent indication of kidney biopsy was nephrotic syndrome.

Keywords: Glomerular disease, kidney biopsy, histopathological pattern, adult patients

INTRODUCTION

Glomerular disease is the major cause for End-stage kidney disease. Kidney biopsy is an essential tool in nephrologists' clinical practice for determining diagnosis, prognosis, and therapy of a variety of glomerular illnesses [1]. A kidney biopsy is a reasonably safe procedure, with less than 0.1% of biopsies resulting in life-threatening consequences [2]. A diverse pattern and frequency of glomerular disorders has been reported in various studies [3, 4]. The incidence of this disease varies geographically, etiologically, and socioeconomically. As a result, understanding its prevalence is critical. Biopsy proven renal disorders provide a precise instrument for clinical practice and research. Glomerular illnesses can be either primary due to environmental sources or systemic in nature [5]. Proteinuria, hematuria, hypertension, and renal insufficiency are some of the clinical manifestations of this group of illnesses [6]. The clinical course of uremia can range from indolent to progressive. Chronic renal illnesses are a primary cause for doing a renal biopsy, since their prevalence has grown in recent years, with patients typically presenting at a late stage [7]. The research does mention changes in the prevalence of glomerular disorders. IgA nephropathy has become more common in Asian populations [8, 9]. Membranous nephropathy (MN) was once the most frequent among Chines population [10]. In the lack of a common renal registry, the frequency of glomerular disorders in diverse geographical areas of the subcontinent has been studied in a few studies as distinct centers. The current study aimed to assess the histological pattern of glomerular disorders in native kidney biopsies.

METHODOLOGY

A total of 94 suspected primary glomerular disease (GD) patients were investigated in this cross-sectional study conducted in the Nephrology Unit of Medicine department of Mayo Hospital, Lahore from 21st January 2021 to 20th February 2022. All the patients (> 15 years age) with suspected primary glomerular disease were enrolled. Patients with diabetes mellitus, drug-induced kidney injury, long standing hypertension, interstitial, lupus nephritis, probable secondary glomerular disease, and tubular were excluded. A qualified histopathologist examined all specimens. Repeat biopsies were conducted on individuals who had inconclusive results or insufficient samples. Individual's demographic details, diagnostic tests, clinical presentation, kidney biopsy indications, and post-biopsy complications were recorded on pre-designed questionnaire/pro-forma.

Data analysis was done using SPSS version 27. Quantitative variables were described as mean and standard deviation whereas frequency and percentages were used for qualitative variables. Chi-square test was used for the determination of statistical significance with 5% level of significance.

RESULTS

Out of the total 94 patients, about 76 (80.9%) patients had primary glomerular disease diagnosed on native kidney biopsies. The overall mean age was 38.4± 6.2 years. Out of 94 primary glomerular disease patients, there were 48 (51.1%) male and 46 (48.9%) females. The incidence of nephrotic syndrome and unexplained renal parameters elevations were 47.4% (n=36) and 31.6% (n=24) respectively. The prevalence of Primary focal segmental glomerulosclerosis (FSGS), membrano-proliferative glomerulonephritis (MPGN), minimal change disease, and IgA nephropathy was 30.3% (n=23), 25% (n=19), 17.1% (n=13), and 6.6% (n=5) respectively. Kidney biopsy post-complications were found in 8 (10.5%) cases. The distribution of different histopathological patterns of glomerular disease among adult's patients demonstrated in Figure-1. Table-I represents the primary glomerular disease pattern distribution in various age groups. Figure-2 illustrate the various clinical presentations of primary glomerular disease based on kidney biopsy.

FSGS (focal segmental glomerulosclerosis), MPGN (membrano-proliferative glomerulonephritis), MCD (minimal change disease), IgA N (IgA nephropathy), MN (membrane nephropathy), and DMPG (diffused-proliferative glomerulonephritis.

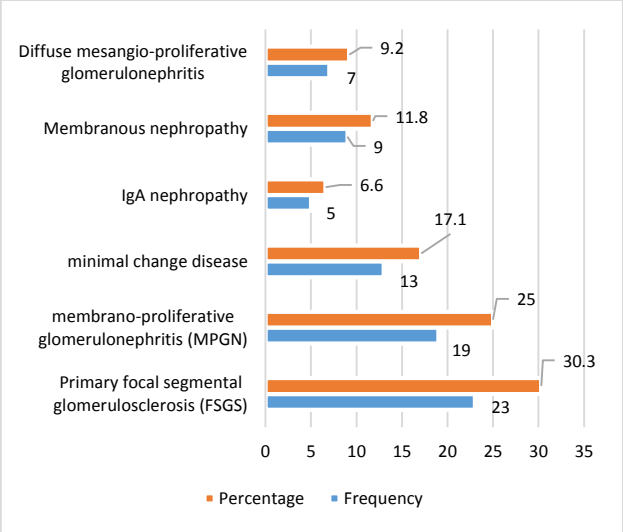

Figure-1: Different histopathological pattern of glomerular disease among adult's patients (N=76)

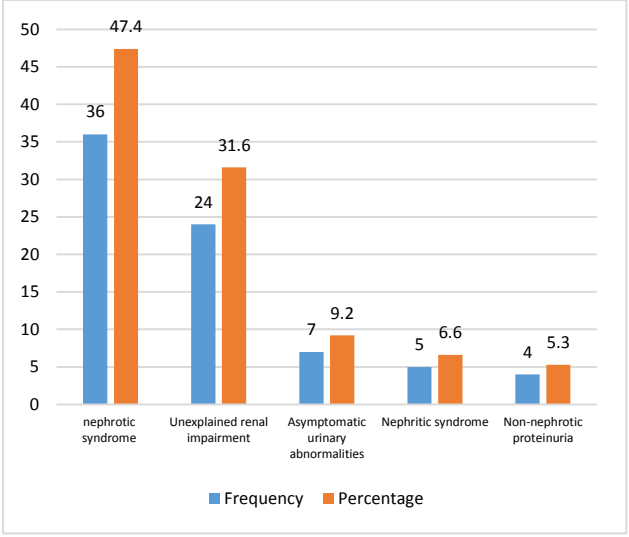

Figure-2: various clinical presentations of primary glomerular disease based on kidney biopsy

Table-1: Distribution of various pattern of primary glomerular disease in various age groups (N=76)

Age groups (Yrs.)	FSGS	MPGN	MCD	IgA N	MN	DMPG
15-30	11 (47.8)	9 (47.4)	8 (6.2)	3 (60)	5 (55.6)	4 (57.1)
31-45	9 (39.1)	6 (31.6)	4 (3.1)	1 (20)	3 (33.3)	3 (42.9)
46-60	0 (0)	3 (15.8)	1 (7.7)	1 (20)	1 (11.1)	0 (0)
>60	3 (13)	1 (5.3)	0 (0)	0 (0)	0 (0)	0 (0)
Total	23 (100)	19 (100)	13 (100)	5 (100)	9 (100)	7 (100)

DISCUSSION

The current investigation mainly focused on the histopathological pattern of primary glomerular disease among adult patients and found that the most common causes of primary glomerular disease were MPGN and FSDS. Nephrotic syndrome was the prevalent cause of kidney biopsy. A significant proportion of patients had biopsies as a result of elevated renal parameters, demonstrating the rising emphasis on completely identifying individuals with potentially reversible kidney impairment. Glomerular illnesses are infrequent, and the number of cases encountered is much lower. As a result, national renal registries aid in the collection and maintenance of epidemiological data that aid in understanding the impact of age, gender, ethnicity, and geographical differences within the country. A number of researchers have investigated the variety of glomerular diseases in the tropics, and it has been discovered that the most common presenting clinical syndrome is nephrotic syndrome, and the diseases are mainly primary in nature, except in a few countries, where secondary glomerulonephritis was found in 54% of nephrotic syndrome patients [11]. IgA nephropathy is the most frequent glomerular disease among Europeans and Americans, with research showing a rise in East Asia [12].

The frequency of glomerular disorders in various parts of the country and geographical areas provides information about the incidence of this very uncommon disease. The incidence pattern is regulated by genetic, environmental, and socioeconomic factors [13]. MCD was found to be the most prevalent primary glomerulonephritis in most investigations, although Habib et al. identified focal segmental and diffuse mesangial proliferative glomerulonephritis as the most common [14-16]. MN is the most prevalent in the majority of research, with only a handful from Pakistan [17, 18]. Recent studies, on the other hand, have indicated a fivefold rise in the prevalence of FSGS and a threefold increase in MN during a five decade period [19].

With the introduction of frequent use of IF and improved classification of these patients into IgA N, DN, LN, and so on, MPGN has been found. MCD was the most common cause of adult onset nephrotic syndrome in numerous investigations, with an incidence ranging from 15% to 37% [20]. This disparity in glomerular disease prevalence might be attributed to the northeastern population's varied eating and cultural habits, as well as genetic variety and similarities to the East Asian population [21]. Although the clinical presentation was comparable to earlier studies from India, the most prevalent was nephrotic syndrome (57.8%), followed by nephritic syndrome (31.4%). In Europe and East Asian nations like Japan, Korea, and China, IgA nephropathy is the most frequent main GN [22-24].

The incidence of nephrotic syndrome was 47.4% based on kidney biopsy reported in the present study. Similar results were reported in adult kidney biopsy from Europe [25]. In the present study the incidence of unexplained renal parameters elevations was 31.6% which is comparable to previous study findings [26].

A previous study conducted on Bangladeshi patients reported that FSGS and MPGN were predominant causes of primary GN [27]. Another study conducted on 1793 adult patients in Pakistan found that the incidence of FSGS was 29% [28]. FSGS is more common in people of Asia in affluent nations with reported renal data, with a fast rising frequency [29].

The prevalence of IgA nephropathy among patients significantly affected by normal renal function and persistent microscopic hematuria based on performing kidney biopsy [30]. The incidence of IgA nephropathy was 6.6% in our study. Renal biopsy is not recommended for isolated micro and macroscopic hematuria among adult patients. The benign appearance of different attributes associated with IgA nephropathy reported to be the main cause for lower prevalence of IgA nephropathy [31].

CONCLUSION

The present study observed that MPGN and FSDS were the most prime causes for primary glomerular disease. The most prevalent indication of kidney biopsy was nephrotic syndrome. Majority of patients were biopsied due to increased renal parameters, reflecting the growing emphasis on fully identifying patients with potential reversible kidney injury.

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