

Evaluation of Sociodemographic Characteristics and the Relationship Between Initial Complaints and Histopathological Diagnosis of Patients Who Underwent Kidney Biopsy Procedure Between 2007-2011

2007-2011 Yılları Arasında Böbrek Biyopsisi Yapılan Hastaların Sosyodemografik Özelliklerinin ve Başvuru Şikayetlerinin Histopatolojik Tanılarıyla Olan İlişkinin Değerlendirilmesi

ABSTRACT

OBJECTIVE: The aim of this study is to evaluate the relationship between patients' age, gender, body mass index, family history, initial complaints and histopathological diagnosis and progression to end stage renal failure.

MATERIAL and METHODS: 268 patients, who had renal biopsy in GATA Nephrology Department between 2007 and 2011, included to the study. All of the patients had native renal biopsy. The patients' clinical and pathological findings were compared with age, gender and other sociodemographic features.

RESULTS: The mean age was 34±15 years among men and 47±17 years among women. The most common histopathological diagnosis was FSGS with the rate of 20.9% (n=56) and the second was IgA nephropathy with the rate of %18.7 (n=50). The rate for completely asymptomatic patients without any complaints or abnormal test results or patients who were determined during routine examination before the operation found to be 25,7% (n=69). Face and leg edema found to be the most common complaint.

CONCLUSION: Fighting against risk factors (hypertension, diabetes, smoking, obesity, etc.) even before the disease presents, which actually is the basis of preventive medicine; will slow down the progression of CKD, decrease mortality and morbidity, and thus will contribute to the country's economy.

KEY WORDS: Renal biopsy, Glomerulonephritis, Chronic renal failure

ÖZ

AMAÇ: Bu çalışmanın amacı; böbrek biyopsilerinin incelenerek, hastaların yaş, cinsiyet, vücut kitle indeksi, aile öyküleri ve geliş şikayetleri ile hastaların histopatolojik tanıları ve son dönem böbrek yetmezliğine ilerleme durumları arasındaki ilişkinin değerlendirilmesidir.

GEREÇ ve YÖNTEMLER: Çalışmaya GATA İç Hastalıkları Anabilim Dalı, Nefroloji Bilim Dalında 2007-2011 yılları arasında böbrek biyopsisi yapılan 268 hasta dahil edildi. Hastaların tümü native böbrek biyopsisi olan hastalardı. Veriler SPSS-15 programına aktararak istatistiksel analiz yapıldı.

BULGULAR: Hastalarımızın %83,2'si (n= 223) erkek, %16,8'si (n=45) kadındı ve yaş ortalamaları erkeklerde 34±15 iken kadınlarda 47±17 idi. Hastalarımızın %50'si (n=134) 20-29 yaş aralığındaydı. Böbrek biyopsisi yapılan hastalarda en sık histopatolojik tanı % 20.9 (n=56) ile FSGS idi. 2. sıklıkta ise %18.7 (n=50) ile IgA nefropatisi bulundu. Hastalarda en sık biyopsi endikasyonu asemptomatik idrar bozukluğu, 2. sıklıkta ise nefritik sendrom idi. Herhangi bir şikayeti olmayıp tamamen asemptomatik olan veya operasyon öncesi yapılan rutin tetkikler sırasında tespit edilen hastalarımızın oranı %25,7 (n=69) olarak saptandı. En sık şikayet bacaklarda ve/veya yüzde şişlikti.

SONUÇ: KBH ile mücadele etmede en etkin yöntem birinci basamakta görev alan aile hekimlerine düşmektedir. Koruyucu hekimliğin temeli olan hastalık ortaya çıkmadan önce hastada mevcut olan risk faktörleriyle (hipertansiyon, diyabet, sigara, obezite vb.) mücadele etmek; salgın haline gelmiş olan KBH'nın ilerlemesini yavaşlatarak mortalite, morbiditeyi azaltarak ülke ekonomisine büyük kazanç sağlayacaktır..

ANAHTAR SÖZCÜKLER: Böbrek biyopsisi, Glomerulonefrit, Kronik böbrek hastalığı

Servet YÜKSEL¹
Mahmut İlker YILMAZ²
Ümit AYDOĞAN³
Oktay SARI⁴
Armağan GÜNAL⁴
Bayram KOÇ⁵

- 1 Topel Naval Air Main Base Command, Primary Care Inspection Center, Kocaeli, Turkey
- 2 Gulhane Military Medical Academy, Department of Nephrology, Ankara, Turkey
- 3 Gulhane Military Medical Academy, Department of Family Medicine, Ankara, Turkey
- 4 Gulhane Military Medical Academy, Department of Pathology, Ankara, Turkey
- 5 Gulhane Military Medical Academy, Department of Internal Medicine, Ankara, Turkey



Received : 04.01.2013

Accepted : 25.02.2013

Correspondence Address:

Servet YÜKSEL
Topel Deniz Hava Ana Üs Komutanlığı,
Birinci Basamak Muayene Merkezi,
Kocaeli, Turkey
Phone : +90 312 304 31 47
E-mail : drservetyuksel@gmail.com

INTRODUCTION

Even though renal diseases can generally be easily detected by simple and low-cost urine and blood tests, and thus can be prevented or delayed; they are also overlooked in many cases due to lack of awareness and early detection. Therefore they cause serious morbidity and mortality.

CREDIT is one of the most important CKD (chronic kidney disease) prevalence studies conducted in Turkey recently. In this study, the CKD rate among the general adult population in Turkey was found to be 15.7%. The rate of patients with a low GFR rate (<60 ml/min) was 5.1% and one in every 20 patients had critical CKD. According to the hemodialysis, transplantation and nephrology record system report in 2009, Turkey, the renal replacement therapy (hemodialysis, peritoneum dialyses and transplantation) incidence was found to be 15.029 and general prevalence was 59.443. It is anticipated that this number will annually increase 10% and exceed one hundred thousand by 2015, and that treatment expenses which are currently about 1.5 billion dollars will double. The highest risk factors for CKD are diabetes, hypertension, cardio-vascular diseases, family history of renal disease and advanced age. Other risk factors can be obesity, smoking, renal calculus, recurrent urinary tract infections, frequent non-steroidal anti-inflammatory usage, connective tissue diseases and low birth weight. Again according to the CREDIT study, among adults with CKD, 33% had hypertension, 12.7% had diabetes, 32% had obesity and 35% were active smokers. On the other hand, morbidity and mortality rate among patients with CKD were found to be 10-30 fold higher than healthy individuals. Cardiac and vascular diseases were the cause of death for more than half of these patients (1, 2).

Glomerular diseases are one of the most common causes of chronic renal failure (3). Infections, autoimmunity, medications and some genetic disorders are implicated in the etiopathogenesis although it has not been clearly defined yet. The clinical course of glomerulonephritis (GN) can cause various clinical syndromes from asymptomatic proteinuria to acute nephrotic syndrome.

Histopathological subtypes of GN vary depending on geographic location, age group, ethnicity, biopsy indications and on the attitudes by authorities towards the issue.

In our study we aimed to investigate the GN prevalence, related socio-demographic features, progress to end-stage renal failure and initial complaints during hospitalization in our patients on whom a renal biopsy was performed due to various clinical indications.

MATERIAL and METHODS

Our study was conducted at the Gülhane Military Medical Academy's Nephrology Department, on 268 patients who had undergone a renal biopsy between 2007 and 2011. The local ethical committee of Gülhane School of Medicine, Ankara,

Turkey approved the study protocol and informed consent was obtained from each subject.

All records had been kept. In our descriptive study examining patient files retrospectively, we recorded socio-demographic data (age, occupation, birth place, marital status, income level, number of family members, body weight and height, alcohol and smoking, blood pressure levels, personal background and family history), initial complaints and physical examination findings, Laboratory tests (urine analysis, 24h urine protein measurement, hemogram, urine, creatine, total protein, AST, ALT, sodium, potassium, magnesium, chloride, phosphate, calcium, cholesterol, triglyceride, HDL, LDL, serological markers etc.), USG findings prior to biopsy, histopathologic renal biopsy results, development of any complication after biopsy, ongoing medications, any possible complication due to current medications, end-stage renal failure progression.

Ultrasound-guided kidney biopsies had been performed by nephrologists using automatic biopsy needles. All biopsy samples were evaluated at GATA Pathology Department, and they were examined utilizing an optical microscope and the immunofluorescent method. All biopsies obtained from patients enrolled in our study belonged to the native kidney. Biopsy indications were identified as nephritic syndrome, nephrotic syndrome, combined nephritic and nephrotic syndromes, acute or chronic renal failure, asymptomatic hematuria or proteinuria (asymptomatic urinary disorder).

All following were excluded from the study: Insufficient glomerulus count for histopathological evaluation, biopsies from a transplanted kidney, all childhood biopsies, and those cases with inadequate data regarding clinical, laboratory and pathological information.

The SPSS for Windows 15.0 (Chi, IL, USA) package program was used for statistical analysis. Definitive statistical data were described as mean \pm standard deviation and minimum-maximum for continuous variables; and as % and frequency for discrete data. Pearson's chi-square test was used. The statistical significance level accepted as $p < 0.05$.

RESULTS

83.2% (n=223) of our patients were male and 16.8% (n=45) were female. The mean age for male patients was 34.03 ± 14.5 years while it was 47.29 ± 17.26 years for female patients. 50% (n=134) of our patients were between the ages of 20 and 29 years. Some demographics and clinical characteristics are shown in Table I.

56.8% (n=152) of our patients had visited a physician with suggestive complaints of a renal disease, while 25.7% (n=69) were either totally asymptomatic or detected to have a kidney disease during routine tests prior to an operation. Also some of our patients, 17.5% (n=47), visited a physician with various complaints suggesting no renal disease, but found to have a renal

function disorder or abnormal urine test results after medical examination. All in all, about 43.2% (n=116) of our patients had no complaint suggesting a renal disease (Figure 1).

Patients who were admitted to the hospital with complaints suggesting a renal disease suffered mostly from swelling on their face or legs, followed by lower-abdominal pain and urinary complaints. Patients (44.6%) without a specific complaint usually had weakness, followed by headache at a rate of 25.5%.

Clinical evaluation together with laboratory test results showed that asymptomatic urinary disorders (%36.9 ; n=99) were the most common indication for biopsy, and the second most common indication was nephritic syndrome (18.7% ; n=50).

The most commonly established histopathological diagnoses were found to be Focal Segmental Glomerulosclerosis and IgA nephropathy. Other diagnoses are shown in Table II.

Evaluating the relationship between initial complaints during admission and progress to end-stage renal failure, we found that 65.4% (n=17) of patients that showed progress to ESRD (end-stage renal disease) had no complaint during admission, and 40.9% of patients without progression to ESRD had no complaints during admission. The difference in asymptomatic

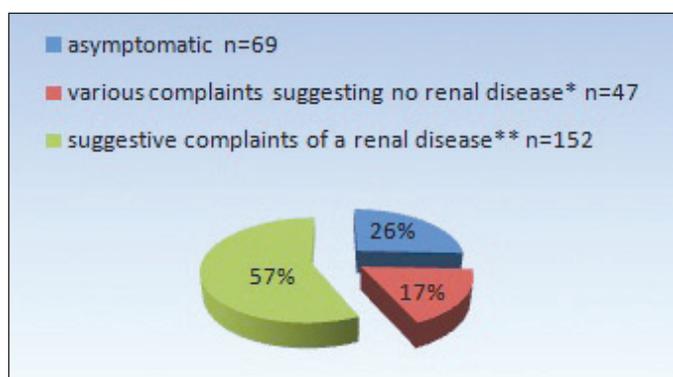


Figure 1. Complaints of patients.

*:(weakness, headache, sickness, stomachache, skin eruption etc.)

**:(Lower-abdominal pain, dysuria, nocturia, oliguria, hematuria, swelling of face or legs, etc.)

course rate during admission was found to be statistically significant between patients who progressed to ESRD and who had no signs of such progress (p=0.015).

65% (n=17) of the 26 patients who progressed to ESRD were smokers, while 34.7% (n=9) were non-smokers and this was

Table I: Demographics and clinical characteristics.

		N	%
Age	20-29	134	50
	30-39	47	17.5
	40-59	57	21.3
	≥60	30	11.2
Gender	Male	223	83.2
	Female	45	16.8
Regions of Turkey	Central Anatolia	90	33.6
	Eastern Anatolia	34	12.7
	Southeastern Anatolia	20	7.5
	Black Sea	53	19.8
	Mediterranean	24	9
	Marmara	24	9
	Aegean	21	7.8
Smoke	Yes	126	47
	No	142	53
Obesity or overweight	Female	28	23.3
	Male	92	76.7
Hypertension	Yes	148	55.2
	No	120	44.8
Indications of biopsy	Asymptomatic urinary disorder	99	36.9
	Nephritic syndrome	50	18.7
	Nephrotic syndrome	42	15.7
	Renal failure	48	17.9
	Nephrotic + Nephritic syndrome	29	10.8

Table II: Distribution of histopathological diagnoses.

	N	%
Focal segmental glomerulosclerosis	56	20.9
IgA nephropathy	50	18.7
Amyloidosis	15	5.6
Chronic glomerulonephritis	15	5.6
Crescentic glomerulonephritis	13	4.9
Membranous glomerulonephritis	20	7.5
Minimal change disease	16	6
Diffuse proliferative glomerulonephritis	15	5.6
Hypertensive nephropathy	12	4.5
Diabetic nephropathy	3	1.1
Membranoproliferative glomerulonephritis	11	4.1
Tubulointerstitial glomerulonephritis	14	5.2
Fabry disease	3	1.1
Alport disease	1	0.4
Cast nephropathy	2	0.7
Minimal mesenchymal cell and increase of matrix	22	8.2
Total	268	100

statistically significant compared to people who did not progress to ESRD ($p=0.038$).

Evaluating the relationship between age and progression to ESRD, we found that 42.3% ($n=11$) of our patients who progress to ESRD were ≥ 60 years old. The difference between patients who progressed to ESRD and who did not was statistically significant in terms of age groups ($p<0.001$).

26.9% ($n=7$) of our patients showing progress to ESRD were obese. This was not statistically significant compared to patients who did not progress to ESRD ($p=0.104$).

Evaluating the relationship between histopathological diagnoses and progression to ESRD, we found that 26.9% ($n=7$) of patients who progressed to ESRD ($n=26$) had crescentic glomerulonephritis, 19.2% ($n=5$) had chronic glomerulonephritis and 15.4% ($n=4$) had amyloidosis. One each of patients with FSGS and IgA nephropathy progressed to ESRD.

The mean glomerulus number obtained from biopsies was 18.2 ± 8.5 ($\text{min}=10$, $\text{max}=71$) and all the samples were sufficient for pathology evaluation.

DISCUSSION

According to 2010 data obtained from the Turkish Nephrology Association, the most common reason for CKD other than diabetes and hypertension is glomerulonephritis at 8.2% (2). As is known, many patients histologically present with

glomerulonephritis but cannot be diagnosed because no routine biopsy is performed. Also many ESRD patients visit a physician during the late stages or chronic period, no biopsy is performed, and the real cause for renal disease remains elusive.

Among the 268 patients whose biopsy results were evaluated, 223 (83.2%) were males and 45 (16.8%) females. Mean age was 36 ± 16 years. This was similar to Ecker et al.'s (38.9 ± 15.4 years) finding they reported after evaluating 513 biopsies from patients with renal disease (4). We also believe that this result was affected by the fact that our hospital serves a younger and mainly male population.

The symptomatology of chronic renal disease is quite variable. Only renal functional reserve is decreased at the early stage of chronic renal disease. Excretory, biosynthetic and regulatory functions of the kidney are usually fine, and therefore no clinical sign or symptom can be seen. Once GFR goes down below 20-25 ml/min/1.73 m² and the advanced stage begins, dysfunctions occur in excretory, biosynthetic and regulatory functions of the kidney, and eventually clinical signs and symptoms (such as continuous weakness, nocturia, bone pain) develop (5).

In our study, 25.7% ($n=69$) of the patients were totally asymptomatic with no initial complaints and were incidentally detected to have a renal disorder or abnormal urine test result. Weakness was the most common complaint among our patients admitted to hospital with complaints suggesting no renal disease

but detected to have abnormal test results. Interestingly, 65.4% (n=17) of our patients that progressed to ESRD had no complaint during admission.

Our biopsy results showed that FSGS was the most common histopathological diagnosis with 20.9%, and IgA nephropathy was the second with 18.7%. As is widely known, histopathological subtypes of glomerulonephritis may differ in distribution depending on geographic area and ethnicity. Examining biopsy results from various regions in Turkey, we observed that MPGN was the most common histopathological diagnosis (6, 7, 8). Akin et al. studied 152 patients with nephrotic syndrome and concluded that Membranous Glomerulonephritis was the most common histopathological diagnosis (9). However, we admitted all the patients to our study without exception, while they included only patients with nephrotic syndrome. Epidemiologic studies in developed countries have shown that MPGN has decreased recently, which is considered to be due to environmental factors such as socioeconomic status and hygiene conditions. The MPGN rate in our study was 4.1%. Reviewing data across the globe, IgA nephropathy was the most common glomerular disease in Western Europe, Australia, New Zealand and some Asian countries (10, 11, 12), while the same data showed FSGS was the most common in the United States, Brazil, and Uruguay (13, 14, 15). Another study from Spain indicates that FSGS is increasing in prevalence recently (16). Our study conforms to these articles as our results showed particularly higher FSGS and IgA nephropathy rates and a lower MPGN rate.

The hypertension rate among our patients that progressed to ESRD was 69.2% and compared with patients who did not progress to ESRD, the difference was statistically insignificant. The MRFIT study, which aimed to determine the relationship between hypertension and progress to ESRD, showed that progress to ESRD was directly associated with hypertension (17). Similarly, the CREDIT study conducted in Turkey, reported that 56.3% of patients with chronic renal disease were also hypertensive, and 29.2% were obese. The results from our study are also consistent with literature data.

A family history of hypertension, diabetes or renal disease was present in 9.3% (n=25) of our patients. 65.3% (n=17) of the 26 patients that progressed to ESRD were smokers, and this was statistically significant compared to the subjects that did not progress to ESRD (p=0.04). 42.3% of our patients who progressed to ESRD were \geq 60 years old. The difference between patients who progressed to ESRD and who did not was statistically significant in terms of age groups (p<0.001). These findings showed that both smoking and age are important risk factors for progression to ESRD, and this was also found to be consistent with literature data (3).

The CREDIT study showed that the prevalence of chronic renal disease in our country is 15.7%. Namely one of every 6-7 patients has chronic kidney disease and this is a public health problem that has already reached epidemic proportions (2).

It's known that hypertension, diabetes and glomerulonephritis are the most common reasons for CKD, and the hypertension and diabetes rates in Turkey are 31.8% and 14.7% respectively. Indeed, these patients are candidates for CKD.

Considering treatment-cost and burden caused by CKD, early detection of these patients is crucial. It should be remembered that these patients are asymptomatic during early stages so potential risk factors should be managed (regulation of high-blood pressure, dealing with diabetes, treatment of smoking cessation, weight-loss by diet and exercise, dyslipidemia screening and therapy, urine analysis etc.), and patient awareness should be raised. Thus, progression to CKD can be minimized. Under these circumstances family physicians providing primary care health services bear tremendous responsibility for fighting against CRD.

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