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ORIGINAL ARTICLE

The analysis of patients with primary and secondary glomerular diseases: A single-center experience

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KEYWORDS
etiology;
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Abstract *Background/Purpose:* Glomerulonephritis is among the most important group of diseases causing end-stage renal disease (ESRD). The prevalence of glomerulonephritis varies depending on age, gender, geographical features, etc. In the present study, we evaluated the clinical and laboratory parameters of patients who underwent renal biopsy.
Methods: In this retrospective study, demographic and clinical characteristics, specific diagnoses of glomerular diseases, and biopsy findings of all patients in whom native renal biopsy was performed in our hospital between January 2009 and December 2014 were analyzed.
Results: A total of 384 patients were divided into two groups as primary glomerular diseases (PGD) and secondary glomerular diseases (SGD). Some 37.1% of patients with PGD and 49.2% of patients with SGD were female. The mean age was 43.8 ± 14.1 years in the PGD group and 47.3 ± 16.1 years in the SGD group ($p = 0.044$). Nephrotic syndrome in the PGD group and unexplained renal dysfunction in the SGD group were observed more frequently at the time of admission. In the SGD group, biopsy findings (crescents, sclerosis, vascular involvement, etc.) were dominant and more pronounced ($p < 0.001$). In the PGD group, responsiveness to the therapy was higher than in the SGD group ($p < 0.001$). Mortality rates were 2.27% in the PGD group and 18.3% in the SGD group. According to the multivariate analysis, the increase of creatinine level after treatment (odds ratio 1.49) and presence of SGD (odds ratio 7.74) were independent risk factors for patient death ($p < 0.001$).
Conclusion: The present study showed important data about the etiology, clinical findings, follow ups, and prognosis of PGD and SGD among adults in our center. We observed that mortality was higher in patients with SGD.

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背景 / 目的: 腎小球腎炎是導致末期腎病 (ESRD) 的最重要疾病,其盛行率與年齡、性別、及地域特性有關。在本研究中,我們在接受腎臟組織活檢的腎小球疾病患者間,對相關的臨床及檢驗特徵進行了調查。
方法: 在本回溯性研究中,對象為於 2009 年 1 月至 2014 年 12 月期間,在本院接受自身腎臟組織活檢的病人。我們對其人口學與臨床特徵、腎小球疾病診斷、及活檢結果進行了分析。
結果: 調查對象為 384 位原發性腎小球疾病 (PGD) 或次發性腎小球疾病 (SGD) 患者。在 PGD 及 SGD 組別中,女性比例分別佔 37.1% 及 49.2%,平均年齡分別為 43.8 ± 14.1 歲及 47.3 ± 16.1 歲 ($p = 0.044$)。入院時,PGD 組以腎病症候群較常見,SGD 組則以原因不明之腎臟功能障礙較常見。在 SGD 組間,活檢結果較多樣化 (新月形、硬化、血管病變等) 且較明顯 ($p < 0.001$)。治療反應比率以 PGD 組高於 SGD 組 ($p < 0.001$),死亡率分別為 PGD 組的 2.27% 及 SGD 組的 18.3%。多變項分析顯示,治療後肌酸酐的增加 (OR 1.49)、及 SGD 的存在 (OR 7.74) 是病人死亡的獨立危險因子 ($p < 0.001$)。
結論: 對於本中心的 PGD 與 SGD 成年患者,本研究提供了成因、臨床表現、追蹤、及預後等方面的重要數據,並觀察到 SGD 患者的死亡率較高。

Introduction

Glomerular diseases may manifest as many clinical presentations such as nephrotic syndrome, nephritic syndrome, acute or chronic renal failure, rapidly progressive glomerulonephritis (RPGN), isolated proteinuria, and hematuria.[1] Glomerular disease may be diagnosed as primary glomerulopathy [e.g., membranous glomerulonephritis (MGN), minimal change disease, focal segmental glomerulosclerosis (FSGS)] or as secondary glomerulopathy as a manifestation of a systemic disease (e.g., diabetes, hypertension, and amyloidosis). However, infections, genetic diseases (e.g., Fabry disease and Alport syndrome), drugs, malignancy, vasculitis, and other conditions should be considered in the differential diagnosis of secondary causes.[2] In addition, clinical and laboratory findings are important for diagnosis. Today, histopathological findings obtained by renal biopsy are valuable for diagnosing glomerular disease and developing treatment strategies.[3–5] This study aimed to evaluate biopsy findings, clinical and laboratory characteristics, mortality, and renal survival in patients who underwent renal biopsy with a preliminary diagnosis of glomerular disease, retrospectively.

Materials and methods

Participants

This retrospective study was performed in consecutive patients aged ≥ 18 years with documented biopsy findings between January 01, 2009 and December 31, 2014. A total of 384 patients were divided into two groups as primary glomerular diseases (PGD) and secondary glomerular diseases (SGD). PGD was described as MGN, FSGS, immunoglobulin A (IgA) nephropathy (IgAN), minimal change disease, and membranoproliferative glomerulonephritis. All patients in the PGD group were evaluated with clinical findings and laboratory tests for secondary reasons of glomerulonephritis. Six IgAN patients (4 males, 2 females) with crescentic glomerulonephritis were evaluated in the PGD group. SGD included patients with RPGN due to secondary reasons, lupus nephritis, amyloidosis, and tubulointerstitial nephritis. The patients with chronic glomerulonephritis in whom biopsy results could not help differentiate primary disease, single kidney, genetic diseases, and malignancies were excluded from the study. In addition, we excluded patients who had a history of long-term diabetes and/or hypertension, were diagnosed with diabetes and hypertension and were receiving antihypertensive and antidiabetic therapy, or in whom renal biopsy findings were compatible with hypertensive nephrosclerosis or diabetic nephropathy. The study was in accordance with the Second Declaration of Helsinki. An informed written consent was taken from all patients before they entered the study.

Demographic parameters (age, gender), indication for renal biopsy (nephrotic syndrome, nephritic syndrome, and unexplained renal dysfunction), laboratory test results [serum urea, creatinine, albumin, lipid profile, daily urinary protein excretion (UPE), Ig, complement (C) levels], pathological diagnosis, detailed description of pathological findings, and medications after renal biopsy were obtained from the medical data and charts of patients in our center. Nephrotic syndrome was defined as proteinuria of > 3.5 g/d associated with edema, hypoalbuminemia, and hyperlipidemia. Nephritic syndrome was proteinuria < 3.5 g/d associated with hematuria, hypertension, and slowly progressive renal failure. We calculated estimated glomerular filtration rate (eGFR) using the Modification of Diet in Renal Disease formula [$186 \times \text{plasma creatinine}^{-1.154} \times \text{age}^{-0.203} \times 1.212$ (if black) $\times 0.742$ (if female)].

Renal biopsy

All biopsy samples were included if a specific diagnosis was certain. Biopsy specimens were examined by the same nephropathologist. Light and immunofluorescence (IF) microscopies were performed in all patients. Light microscopic examinations of sections were stained with hematoxylin and eosin, Masson's trichrome, periodic acid-Schiff, periodic acid-silver methenamine, and Congo red. Homogenous amyloid deposits stained positive with Congo red and immunohistochemical AA amyloid stain, and were sensitive to treatment with potassium permanganate that was