Non-Diabetic Renal Disease in Type 2 Diabetic Patients: Prevalence, Clinical Predictors and Outcomes

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Introduction

Diabetic nephropathy (DN) is one of the most significant microvascular complications of diabetes mellitus (DM) and is the leading cause of end-stage renal disease (ESRD) requiring renal replacement therapy in adults. About one third of patients with type 2 DM suffered from non-diabetic renal disease (NDRD). These diseases can be either alone or superimposed with the DN. The indications of renal biopsy in patients with type 2 diabetes are debatable. The diagnosis of DN is usually based on clinical features, physician and/or single-center experiences. It is generally believed that DN is difficult to reverse, whereas some NDRD are often treatable and remittable. Therefore, the correct diagnosis of such patients would be crucial for disease spesific therapy. In this study, we have aimed to investigate the utility of renal biopsy in patients with type 2 diabetes and the predictability of diagnosing DN versus NDRD from clinical and laboratory data. We also evaluated the prevalence and etiology of NDRD in patients with type 2 diabetes.

Materials and Methods

Data were retrospectively analyzed from 56 patients with type 2 DM who had undergone a renal biopsy from January 2005 to June 2015 at the Department of Nephrology, Ankara University School of Medicine, Ankara, Turkey. In all patients renal biopsy were performed because atypical clinical features. Renal biopsy samples were examined by light and immunofluorescence microscopy. Clinical parameters, laboratory workup and office blood pressure were recorded for each patient at the time of biopsy. The included patients were followed-up for one year. At the end of the one year follow-up period, ESRD requiring renal replacement therapy and mortality were recorded.

Results

Eight patients were excluded, due to missing data. A total of 48 patients (female/male: 26/22 and mean age: 59±8 years) included to the study. Patient characteristics were given in Table 1. According to the biopsy findings, 24 (50%) patients had NDRD alone, 20 (41.7%) patients had DN alone and 4 (8.3%) patients had coexisting DN and NDRD. The characteristics of patients, classified as 3 groups based on their renal biopsy findings, are given in Table 2. The most common NDRDs were membranous nephropathy (29%), tubulointerstisyel nephritis (20%) and IgA nephropathy (12.5%). There were no significant different in three groups with respect to the duration of diabetes, proteinuria, hematuria, and HbA1c levels. Positive and negative predictive value of diabetic retinopathy for DN was 88 and 81%, respectively.

Conclusion

This study demonstrated a highly prevalence of NDRD in patients with type 2 diabetes. The absence of diabetic retinopathy strongly predicted NDRD in type 2 DM. Clinical decision alone can lead to wrong diagnosis and delay of appropriate therapy. Clinician should be considered the usefulness of renal biopsy when there is suspicion on the exact etiology of the kidney disease. It is single center study with a small number of patients. Large, prospective and multicenter studies are needed to clarify prognosis and outcomes.

Table 1: The characteristics of patients

Patient's characteristics	Results
Age (years)	59±8 (22-75)
Sex (F/M)	26/22
Serum creatinine (mg/dl)	2.2±1.8 (0.5-7.2)
Proteinuria (g/day)	5.6±4.4 (0.182-20.6)
Serum albumin (g/dl)	2.6±0.8 (1.1-4)
Microscopic hematuria (%)	58.3
Office SBP (mmHg)	128±16 (100-160)
Office DBP (mmHg)	77±10 (60-100)
Diabetes duration (years)	9.9±8 (1-30)
Diabetic retinopathy (%)	37.5
eGFR (CKD-EPI) (mL/min/1.73m^2)	47.4±30.2 (5-107)
HbA1c (%)	7±1.3 (5-12.4)

SBP, systolic blood pressure; DBP, diastolic blood pressur; eGFR, estimated glomerular filtration rate; CKD-EPI, chronic kidney disease epidemiology collaboration

Table 2: Characteristic of patients according to renal biopsy findings

Patient's characteristics	Patients with isolated NDRD	Patients with isolated DN	Patients with DN plus NDRD	P value
Age (years)	57±11(22-75)	61±5(49-71)	61±2(60-66)	NS
Sex (F/M)	17/7	8/12	1/3	NS
Serum creatinine (mg/dl)	2.4±2(0.5-7.2)	2.1±1.6 (0.7-6.4)	1.7±0.6 (1.1-2.5)	NS
Proteinuri (g/day)	5.2±4.1 (0.197-14.6)	5.7±3.7 (0.250-14.2)	7.4±9.1(0.182-20.6)	NS
Serum albumin (g/dl)	2.6±0.8(1.2-3.9)	2.6±0.8(1.1-4)	2.8±1.1(1.2-4)	NS
Microscopic hematuria (%)	62.5	55	50	NS
Office SKB (mmHg)	125±16 (100-160)	130±15 (100-160)	140±14 (120-150)	NS
Office DKB (mmHg)	77±11 (60-100)	77±9 (60-95)	77±5 (70-80)	NS
Diabetes duration (years)	7.9±7.2(1-30)	11.9±9.1(1-30)	11.7±4.5(6-17)	NS
Diabetic retinopathy (%)	8.3	75	25	<0.05
HbA1c (%)	6.8±0.7(5.5-8.2)	7.4±1.7(5.3-12.4)	5.9±0.9(5-7.2)	NS
eGFR(CKD-EPI) (mL/min/1.73m^2)	49.1±35.4(5-107)	45.8±25.2(6-85)	45±23.7(23-68)	NS
eGFR (CKD-EPI) (12 months after renal biopsy) (mL/min/1.73m^2)	61.2±31.9(8-105)	45.8±31.3(6-93)	57.2±20.2(34-81)	NS
ΔeGFR (CKD-EPI) (12 months after renal biopsy) (mL/min/1.73m^2)	9.7±16.1	-1.7±16.4	12.2±10.2	0.06
Renal replacement therapy (12 months after renal biopsy) (%)	9.5	21		NS
Mortality (12 months after renal biopsy) (%)	19			NS

SBP, systolic blood pressure; DBP, diastolic blood pressur; eGFR, estimated glomerular filtration rate; CKD-EPI, chronic kidney disease epidemiology collaboration; NS, not significant

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