



# CLINICAL AND PATHOLOGICAL CHARACTERISTICS OF NON-DIABETIC RENAL DISEASE IN TYPE 2 DIABETES PATIENTS

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## Introduction and Aims

Renal involvement in type 2 diabetes is mainly due to diabetic nephropathy (DN). Nevertheless, a sizable proportion of diabetic patients could actually have non-diabetic renal diseases (NDRD) or DN plus NDRD.

## Objectives

To explore the pathological features of NDRD in patients with type 2 diabetes and to assess the predictability of diagnosing NDRD with or without DN versus isolated DN on the basis of clinical parameters.

## Methods

Medical records of type 2 diabetes patients who underwent renal biopsy under suspicion of NDRD from January 2011 through November 2015 were analyzed retrospectively.

## Results

- A total of 101 patients with type 2 diabetes and atypical features of DN were enrolled in this study. The mean age was 51.3±11.9 years and the male to female ratio was 1.3:1. The median duration of the diabetes was 6 years (range, 1-20 years). The mean serum creatinine was 2.8±2.2 mg/dL and proteinuria was 5.8±3.4 g/day. Table 2 shows the results of renal biopsy.
- In multiple logistic regression analysis, short-duration diabetes (<8 years) and microscopic hematuria (≥5 erythrocytes per high-power field) were independent predictors of NDRD.

**Table 1. Demographic and clinical characteristics of the study patients**

Characteristics	Isolated DN (n=52)	Isolated NDRD (n=20)	DN plus NDRD (n=29)
Duration of diabetes—years	8.1±4.8	3.8±1.5 <sup>a</sup>	6.4±3.1
Presence of diabetic retinopathy—no (%)	44 (84.6)	3 (15) <sup>a</sup>	19 (65.5) <sup>b,c</sup>
Fasting plasma glucose—mg/dL	183±5.7	140±6.7 <sup>a</sup>	164±5.3
HbA1c—%	8.5±1.0	7.3±0.1 <sup>a</sup>	8.1±1.1 <sup>c</sup>
Serum creatinine—mg/dL	2.69±2.05	1.45±0.50	3.90±2.06 <sup>b,c</sup>
Estimated GFR—ml/min/1.73 m <sup>2</sup>	38.2±27.6	58.7±23.9 <sup>a</sup>	31.8±31.5 <sup>c</sup>
Proteinuria—g/24 h	6.9±3.2	3.5±2.1 <sup>a</sup>	5.3±3.5
Urinary RBCs/hpf	2±4	12±9 <sup>a</sup>	7±8 <sup>b,c</sup>
Urinary WBCs/hpf	1±1	11±8 <sup>a</sup>	6±11 <sup>b</sup>

a: isolated DN vs. isolated NDRD

b: isolated DN vs. DN plus NDRD

c: isolated NDRD vs. DN plus NDRD, all *P* <0.05

**Table 2. Renal pathology of NDRD, with and without DN, in type 2 diabetes patients\***

Histology	NDRD superimposed on DN (n=29)	Isolated NDRD (n=20)	<i>P</i> Value
Acute tubular necrosis	14 (38.9%)	0 (0%)	<0.001
Acute interstitial nephritis	12 (33.3%)	1 (4.8%)	0.005
IgA nephropathy	1 (2.8%)	7 (33.3%)	0.003
Membranous nephropathy	0 (0%)	5 (23.8%)	0.004
Lupus nephritis	2 (5.6%)	4 (19.0%)	NS
Crescentic glomerulonephritis	3 (8.3%)	1 (4.8%)	NS
Others	4 (11.1%)	3 (14.3%)	NS

\*Some patients have more than one NDRD.

## Conclusions

Judicious use of renal biopsy revealed NDRD with or without DN in nearly half of type 2 diabetes patients with atypical renal presentation, especially short-duration diabetes and active urinary sediment.