

## Letter to the Editor

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# Hemodynamic alteration in diabetic nephropathy measured by renal Doppler ultrasonography: Does it predict the outcome of the disease?

Dear Editor,

We read the article by Dr. Futrakul et al. with interest [1]. They searched for a parameter that was more sensitive than microalbuminuria for early detection of diabetic nephropathy and compared creatinine clearance, fractional excretion of magnesium and intrarenal hemodynamics by renal scintigraphic evaluation. For this purpose, they calculated peritubular capillary flow, efferent arteriolar resistance, glomerular hydrostatic pressure and filtration coefficient of glomerular capillary with  $^{99m}\text{Tc}$ -labelled DTPA (diethylene triamine pentaacetic acid) and  $^{131}\text{I}$ -labelled hippuran renal scintigraphy. Accordingly, we have designed a study to examine the intrarenal hemodynamic abnormalities in different stages of nephropathy and further measured the intrarenal resistive index (RI) and pulsatility index of interlobar arteries detected by renal Doppler ultrasonography (USG) for each kidney. For our ongoing prospective randomized trial, we included 20 healthy, non-diabetic patients as a control group; 26 type-2 diabetic patients with microalbuminuria and 19 type-2 diabetic patients with albuminuria as study groups. The clinical characteristics of the control and diabetic subjects with their mean RI values are reported in Table 1.

Table 1

Clinical characteristics of patients with type-2 diabetes and control group with their relevant RI values

	Control	Group 1	Group 2
Number of patients	20	26	19
Male/female	8/12	13/13	7/12
Age (years)	53.3	58.4	59.2
Duration of diabetes (years)		11.1	12.6
Mean blood pressure (mmHg)	91.6	102.5	112.3
Creatinine clearance (ml/min)		87.3	62.1
RI of interlobar arteries of right kidney	0.61	0.68*	0.72*
RI of interlobar arteries of left kidney	0.61	0.70*	0.72*

Data are expressed as mean.

\* $p < 0.001$  versus control (Student's  $t$  test).

Group 1: type-2 diabetic patients with urinary albumin excretion  $<30$  mg/day.

Group 2: type-2 diabetic patients with urinary albumin excretion  $\geq 30$ –300 mg/day.

Gradual increase in mean RI values with the advance of nephropathy is clearly seen, similarly as in the study of Dr. Futrakul et al. where scintigraphic vascular functional parameters changed significantly in albuminuric type-2 diabetics.

In 1997, Dr. Ishimura and colleagues had already observed that the decrease of glomerular function and microcirculatory alterations with the advance of arteriosclerosis in small arteries would change intrarenal hemodynamic parameters like RI in type-2 diabetics [2].

Finally, we would like to mention that, for early detection of diabetic nephropathy and vascular functional assessment in diabetic patients, renal Doppler USG could also provide more detailed and predictive data to the clinician in a non-invasive manner.

We thank Dr. Futrakul and associates for this interesting and insightful article.

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## References

- [1] N. Futrakul, V. Vongthavarawat, S. Sirisalipotch, T. Chairatanarat, P. Futrakul and S.N. Suwanwalaikorn, Tubular dysfunction and hemodynamic alteration in normoalbuminuric type-2 diabetes, *Clin. Hemorheol. Microcirc.* **32** (2005), 59–65.
- [2] E. Ishimura, Y. Nishizawa, T. Kawagishi, Y. Okuno, K. Kogawa, S. Fukumoto et al., Intrarenal hemodynamic abnormalities in diabetic nephropathy measured by duplex Doppler sonography, *Kidney Int.* **51** (1997), 1920–1927.

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