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BACKGROUND

➤ Diabetic nephropathy (DN) is one of the important complications and is detected in almost 30-40% of the patients with type 1 diabetes mellitus (T1DM).

➤ Besides the well known risk factors, endothelial dysfunction also plays a role in the pathogenesis of DN and diabetic retinopathy.

➤ Our aim was to determine flow mediated dilation (FMD) measurements and serum soluble endothelin-1 (ET-1), intercellular adhesion molecule-1 (ICAM-1) and vascular cell adhesion molecule-1 (VCAM-1) levels in type 1 diabetic patients with or without increased albumin excretion and compare them with the control group.

MATERIALS AND METHODS

➤ We enrolled 73 patients with T1DM. Diabetic patients were divided into two subgroups according to microalbumin measurements in 24 hour urine collections. Patients with microalbuminuria formed Group 1 and without microalbuminuria were defined as Group 2. We have also enrolled 40 subjects with similar sex and age distribution as control group (Group 3).

➤ Serum ET-1, ICAM-1 and VCAM -1 levels were determined and FMD measurements were done in all individuals.

RESULTS

➤ Mean age, sex distribution, presence of hypertension, serum low density lipoprotein (LDL) and triglyceride levels were similar in all groups. Diabetic groups were similar in regard to glycemic control and disease duration.

➤ Mean FMD measurement was lower in diabetic groups compared to the control group. FMD was negatively correlated with age.

➤ We didn't detect any difference between groups according to serum ET-1 levels. Median serum ICAM-1 level was higher in diabetic groups compared to the control group.

➤ Median serum VCAM-1 level was higher in the group of patients with microalbuminuria compared to the normoalbuminuric and control groups. Serum VCAM-1 level was found to be positively correlated with degree of urinary albumin excretion ($p > 0.001$).

Table 1. Comparison of groups according to ICAM-1, VCAM-1 and endothelin-1 levels.

Groups	Endothelin-1 Median (minimum- maximum) (fmol/l)	ICAM-1 Median (minimum- maximum) (ng/ml)	VCAM-1 Median (minimum- maximum) (ng/ml)
Group 1	8.1 (0.6-16.5)	5100 (1450-12860) ^a	736.5 (419.9-1516.7) ^a
Group 2	7.7 (3.1-23.5)	4520 (326.1-11070) ^b	975.9 (352.2-1525.5) ^{b,c}
Group 3	10.5 (3.0-19.0)	685.7 (120-14460) ^{a,b}	680.1 (380.0-1041.9) ^b
p-value	0.066	<0.001	0.002

Table 2. FMD measurements of the groups

Groups	FMD (%)
Group 1	6.6 (3.1-10.3) ^a
Group 2	6.4 (4.3-11.1) ^b
Group 3	7.8 (3.1-12.0) ^{a,b}
p-value	0.013

CONCLUSION

➤ ICAM-1 and VCAM-1 are proinflammatory molecules that play an important role in pathogenesis of endothelial dysfunction.

➤ Medical agents that reduce the serum levels of those two molecules would take place in prevention of microvascular complications. Moreover, VCAM1 may be used as a predictive marker for risk stratification of nephropathy development and progression in T1DM.