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Biomarkers for early detection of renal damage and arterial stiffness in adolescent type 1 diabetic patients

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Objective: To evaluate different biomarkers for early detection of renal damage and arterial stiffness in adolescent type 1 diabetic patients.

Patients and methods: The study included 62 type 1 diabetic patients and 30 healthy volunteers of the same age and sex. Blood samples were taken for assessment of resistin, OxLDL, glycosylated hemoglobin, and lipid profile. Urine samples were taken for assessment of albumin/creatinine ratio, Neutrophil gelatinase-associated lipocalin (NGAL), liver-type fatty acid binding protein (L-FABP) and kidney injury molecule-1(Kim-1). Doppler for assessment of carotid intimal medial thickness (cIMT) and renal Doppler (RI) were also done.

Result: HbA1, albumin/ creatinine ratio , lipid profile, NGAL, KIM-1, L-FAB, cIMT and RI were significantly higher while resistin were significantly lower in diabetic patients. KIM-1, L-FAB had a significant positive correlation with microalbuminuria, while resistin had a significant negative correlation with cIMT. Urinary NGAL and L-FABP were significantly higher in diabetics with microalbuminuria. Urinary L-FABP was significantly higher, while resistin was significantly lower in diabetic patients with positive cIMT. Resistin and urinary L-FABP had a good diagnostic accuracy (AUC = 0.7) with patients with cIMT, on the other hand urinary NGAL and resistin had a good diagnostic accuracy of microalbuminuria.

Conclusion: RI and tubular biomarkers precede the development of diabetic nephopathy and microalbuminuria even before they develop signs of glomerular damage, i.e. micro- or macroalbuminuria, thus representing early biomarkers of 'normoalbuminuric' DN with a good sensitivity and specificity. NGAL, KIM-1, L-FAB and Resistin can be considered as an early biomarkers of diabetic nephropathy and atherosclerosis.

Recent Publications

1. Ahmed A. Battah, Soha M. Abd El Dayem, Abo El Magd El Bohy, Amal El Shehaby and Esmat Abd El Ghaffar. Relationship of plasma level of chemerin and vaspin to early atherosclerotic changes and cardiac autonomic neuropathy in adolescent type 1 diabetic patients. J Pediatr Endocr Met 2015; 28(3-4): 265–273.
2. Ahmed A. Battah, Soha M. Abd El Dayem, Abo El Magd El Bohy and Amal El Shehaby.Evaluation of fetuin-A and carotid intima-media thickness in adolescent type 1 diabetic patients. J Pediatr Endocr Met 2015; 28(3-4): 287–292.
3. Ahmed A. Battah, Soha M. Abd El Dayem and Abo El Magd El Bohy. Carotid intimal medial thickness and its relation to endothelial dysfunction and echocardiographic changes in adolescents with type 1 diabetes. J Pediatr Endocrinol Metab 2015; 28(9-10): 1029–1037.
4. Ahmed A. Battah, Soha M. Abd El Dayem, Amal El Shehaby and Nagwa Abd Allah. Assessment of human cartilage glycoprotein 39 (YKL-40), preptin, and nitric oxide in adolescent patients with type 1 diabetes and its relation to cardiorenal affection.
5. Ahmed A. Battah, Soha M. Abd El Dayem, Abo El Magd El Bohy. Assessment of Increase in Aortic and Carotid Intimal Medial Thickness in Type 1 Diabetic Patients. Open Access Macedonian Journal of Medical Sciences. 2016 Dec 15; 4(4):630-635. J Pediatr Endocr Met 2015; 28(3-4): 309–314.

Biography

Ahmed A. Battah is currently professor in Cairo University, Consultant of Cardiology, Endocrinology and diabetes. He completed M.B.B.CH from Cairo University; M.Sc. from Cairo University; M.D. from Cairo University. He is currently working in the Critical Care Unit in Kaser El Aini Hospital. He attended around 150 conferences; has 30 international publications. He is a reviewer in many international journals. He is a supervisor for MSD and MD Co-principle investigator in 3 projects. He is the member of Diabetes and Endocrinology Society for children in Egypt, Egyptian Society of Cardiology, European Society of Cardiology, Egyptian Society of Critical Care Medicine, and European Society of Intensive care Medicine.

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