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Obesity and metabolic syndrome related biomarkers as predictors of development and progression of type 2 diabetes

Ovsyannikov K. V[1], Kirichenko L. L[1], Pozzili P[3] and Suchkov S. V[1,2,4]
[1]A.I.Evdokimov Moscow State Medical & Dental University, Russia
[2]I.M.Sechenov First Moscow State Medical University, Russia
[3]University Campus Bio-Medico, Italy
[4]EPMA (European Association for Predictive, Preventive and Personalized Medicine), Belgium

Background: Early diagnostics and identification of patients at high risk for t2DM requires reliable biomarkers that can be detected long time before the manifestation of t2DM. The biomarkers in-clude an extensive group of substances like immunological markers, biochemical parameters in-cluding endothelial function mediators, indicators of activity of adipocytes, proinflammatory factors etc., offered a novel instrument Diabetes Risk Score to calculate the risk of t2DM using an extended set of 64 circulating candidate biomarkers. At the same time, technical difficulties of performing numerous biochemical tests in routine clinical practice encouraged us to search for more affordable methods. The purpose of this study was to estimate fasting hyperinsulinemia as a potential biomarker to predict development of t2DM in MS patients.

Methods: Retrospective analysis of t2DM new cases incidence in normoglycemic MS patients with previously measured fasting insulin in an outpatient primary care center in Moscow was conducted. Patients with insulin level above 15mkME/ml were considered as hyperinsulinemic. The study in-cluded 247 patients with MS (115 male and 132 female). The average patient age was 56 ± 5,8 years.

Results: After 3 years of observation 54 (21.9%) of 247 patients developed t2DM. Further analysis showed that 78% of diagnosed t2DM patients had fasting hyperinsulinemia in early stages of obser-vation. At the same time only 14% t2DM-free patients had diagnostic hyperinsulinemia on admis-sion.

Conclusion: The presence of fasting hyperinsulinemia can be regarded as one of useful biomarkers of t2DM in patients with MS. The fact that hyperinsulinemia in patients with MS is closely corre-lated with the level of insulin resistance, and its presence and severity plays a key role in the devel-opment of type 2 diabetes is well established. The advantages of this test are technical simplicity and relatively low cost, which can at certain extent substantiate our proposal to use fasting insulin level as a screening method to identify groups at risk of t2DM development among people with ob-esity and MS long time before the manifestation of type 2 diabetes mellitus.

Biography

Konstantin Ovsyannikov graduated from I.M.Sechenov Moscow Medical Academy and was awarded with M.D. in 1996. He obtained his Ph.D. as a Ph.D. student of the Department of endocrinology and diabetology of the Russian Postgraduate Medical Academy, Moscow, Russia. From 2003 through 2007 Konstantin Ovsyannikov worked as assistant professor of Department Internal Medicine of Medical Professional Education Institute of Federal Medico-Biological Agency of Russia. From 2007 until now Dr. Ovsyannikov is professor of Department of Internal Medicine (Postgraduate Education Faculty) of Moscow State University of Medicine & Dentistry.

kvovsn@gmail.com

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