The dynamic changes of zinc transporter 8 autoantibodies in Czech children from the onset of Type 1 diabetes mellitus.

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Abstract

AIMS: The prevalence of autoantibodies to zinc transporter 8 (ZnT8) in Czech children at the onset of Type 1 diabetes mellitus and dynamic changes in ZnT8 autoantibody levels during disease progression were studied. The value of ZnT8 autoantibody measurements in diagnosis of Type 1 diabetes was assessed.

METHODS: Serum samples from 227 children with newly diagnosed Type 1 diabetes and from 101 control children without diabetes were analysed in a retrospective cross-sectional study. One hundred and seventy-one samples from 116 of the patients with diabetes were analysed in a follow-up study at (median) intervals of 1, 3, 5 and 10 years after onset of Type 1 diabetes. ZnT8 autoantibodies were measured using a bridging enzyme-linked immunosorbent assay, while antibodies to glutamic acid decarboxylase, insulinoma antigen 2 and insulin were measured by radioimmunoassays.

RESULTS: ZnT8 autoantibodies were detected in 163/227 (72%) of children at Type 1 diabetes onset and in 1/101 (1%) of the control subjects. Sixteen out of 227 (7%) patients with Type 1 diabetes were antibody negative based on three
antibodies (glutamic acid decarboxylase, insulinoma antigen 2 and insulin). This false-negative rate was reduced to 10/227 (4.4%) ($P < 0.05$) after inclusion of ZnT8 autoantibody measurements. Of the children, 142/227 (63%) were positive for at least three antibodies and the most common combination was insulinoma antigen 2, glutamic acid decarboxylase and ZnT8. ZnT8 autoantibody levels decreased over time after Type 1 diabetes onset and the presence and level of ZnT8 autoantibodies correlated with IA-2 autoantibodies.

CONCLUSIONS: A ZnT8 autoantibody enzyme-linked immunosorbent assay showed 72% disease sensitivity and 99% specificity at Type 1 diabetes onset. Measurements of ZnT8 autoantibodies are important for Type 1 diabetes diagnosis and should be included in the panel of autoantibodies tested at the onset of Type 1 diabetes.


Published: 14. 9. 2015 / Responsible person: Mgr. Ing. Tereza Kůstková

Source URL (modified on 16. 5. 2018 - 7:03):