

Title: Maternal coxsackievirus B antibodies reduce the risk of early coxsackievirus B infections – implications for preventive vaccine

Authors:

Nanna Kangasmäki, Amir-Babak Sioofy-Khojine, Jussi P. Lehtonen, Leena Puustinen, Jorma Toppari, Riitta Veijola, Johanna Lempainen, Kalle Kurppa, Suvi Virtanen, Mikael Knip, Jutta Laiho, Heikki Hyöty

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Abstract

Prospective studies have shown association between coxsackievirus B (CVB) infections and the initiation of islet autoimmunity (IA) and type 1 diabetes (T1D). Maternal antibodies provide protection against child's early infections, but the antibodies disappear gradually by the age of one year.

This study sets out to assess whether maternal CVB1-CVB5 antibodies can protect against early CBV infections and how long this protection lasts. The hypothesis was that the frequency and titers of maternal CVB neutralizing antibodies and timing of child's CVB infections are important.

Neutralizing antibodies were analyzed against CVB1-CVB5 in cord-blood sera and in serial plasma samples taken at the age of 3, 6 and 12 months from 529 Finnish DIPP children who were followed from birth, including 169 case children who developed multiple islet autoantibodies. CVB infections were diagnosed by seroconversions in CVB antibodies.

Maternal CVB1 antibodies were detected in cord blood in 26% of the children whereas antibodies against the other four serotypes were detected in approximately half of the children. By the age of 12 months 44% of the children had had an infection by any of the five CVB serotypes. 10% of the children had had an infection by more than one of the CVB serotypes. Most CVB infections occurred in children who lacked maternal antibodies.

The results suggest that a vaccine that can induce neutralizing CVB antibodies would efficiently protect against CVB infections. The vaccine should be given during the first months of age to prevent the first infections.