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Is it possible to prevent Type 1 diabetes?

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Type 1 diabetes is a severe disease. In spite of intensive treatment with effective insulin preparations, pumps, sensors and other modern devices, it is impossible to avoid both severe acute and late complications. Furthermore the incidence increases and nobody can be cured.

Thus Type 1 diabetes fullfils well the criteria for a disease where prevention is very meaningful. It may even be justified to try prevention even with therapy that leads to some adverse events and risks.

Primary prevention is tried using avoidance of cow milk proteins early in life (the TRIGR trial). Results from the TRIGR pilot II trial suggests a decrease in prevalence of diabetes-related autoantibodies, but this result is weak, as it is not based on all participants in that trial, and there is no difference in incidence of Type 1 diabetes in that trial. The results from the TRIGR main study will come year 2016.

Secondary prevention has been tried with large doses of Nicotinamide (ENDIT) which did not work. Autoantigen treatments with daily insulin injections, used in Diabetes Prevention Trial (DPT) in USA did not have any effect, and oral insulin in the same trial did not reach its primary endpoint, although subanalyses suggests that there may have been a preventive effect of oral insulin in the subgroup with very high concentration of insulin autoantibodies (IAA). Nasal insulin given to high risk children did not work. Probiotics have been discussed but not tried in large scale clinical trials.

Until recently the antiCD-3 monoclonal antibodies were regarded as the most efficacious therapy for preservation of residual insulin secretion. Thus, although such treatment causes both common and rather severe adverse events and risks, the treatment is tried for prevention. This preventive treatment can be questioned even more now since two large Phase III trials (Macrogenics and Tolerx) have both failed to reach their primary endpoints.

GAD-therapy remains as a seemingly safe and possibly efficacious way of preventing Type 1 diabetes. Intervention in patients 10-18 years with recent onset Type 1 diabetes has shown encouraging preservation of insulin secretion. The treatment has been easy, well tolerated without treatment related adverse events. If ongoing Phase III trials confirm the results, this treatment will perhaps become a realistic method for prevention of Type 1 diabetes.