Drug Safety 1999 Nov; 21 (5): 423-425
0114-5916/99/0011-0423/$01.50/0

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Immunisation and Type 1 Diabetes Mellitus: Is There a Link?

We disagree with Hiltunen et al.'s paper[1] pertaining to vaccines and type 1 (insulin-dependent) diabetes mellitus, which claims that there is no clear evidence that immunisation is associated with type 1 diabetes mellitus. The authors fail to cite our main epidemiology and animal toxicology papers which show immunisation starting in the first month of life is associated with a decreased risk of type 1 diabetes mellitus while immunisation starting after 2 months is associated with an increased risk of type 1 diabetes mellitus.[2,3]

In one epidemiology study we demonstrated that immunisation with hepatitis B vaccine starting after 2 months of life was associated with an increased risk of type 1 diabetes mellitus in New Zealand; the relative risk was 1.6. A US government study[4] found that hepatitis B immunisation starting after 2 months of life was associated with an increased risk of type 1 diabetes mellitus; the odds ratio was 1.9. Our data also indicated that BCG immunisation starting at school age is associated with an almost doubling of the risk of type 1 diabetes mellitus. A case control study from Quebec confirmed our finding.[5] The authors found 14 of 249 patients with diabetes had received BCG immunisation after 1 year of life versus 12 out of 431 control participants, giving an odds ratio of 2. We have also described an increase in type 1 diabetes mellitus associated with the haemophilus influenza immunisation in Finland[6] and that similar increases occurred in the US and UK following the introduction of the haemophilus vaccine.

We strongly disagree with the statement about the mumps measles rubella (MMR) vaccine. Increases in the incidence of type 1 diabetes mellitus occurred in both age groups receiving the MMR vaccine in Finland. The authors' statement about a lack of cohort effect is misleading. The MMR vaccine was given to children 6 years of age in Finland; however, the authors only studied a cohort effect in children 7 years of age and older.[7] A large increase in the incidence of type 1 diabetes mellitus occurred in children aged 6 years[8] which coincided with the introduction of the MMR vaccine and the incidence of type 1 diabetes mellitus in the 5- to 9-years-old age group increased in the 1982 to 1984 period following the introduction of the vaccine, fig. 1.[1] Furthermore, a spike in the incidence of type 1 diabetes mellitus occurred in Finland in 1983[8] following the introduction of the MMR in both the 0 to 4 and 5 to 9 age groups who received the vaccine starting in late 1982, but not in the 10 to 14 age group who did not receive the vaccine.

Substantial data exists linking immunisation to the development of type 1 diabetes mellitus. There are several poorly designed studies which appear not to support a link, however, these are to be expected. Our data showing an effect involve cohort and comprehensive ecological studies following

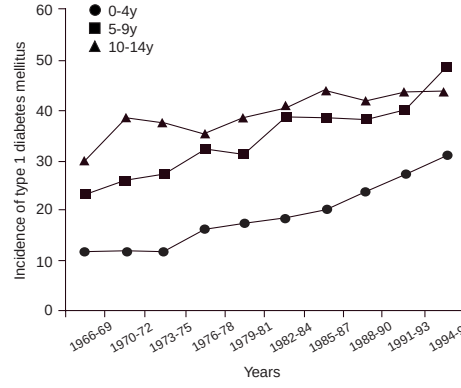

Fig. 1. Type 1 (insulin-dependent) diabetes mellitus incidence in Finland during the years 1966 to 1996 is shown as mean age-adjusted incidences of 3-year periods in children of 3 age groups. A mumps-measles-rubella mass vaccination programme was implemented in 1982. Incidence figures were calculated as described in Hyöty et al.[7] (reproduced from Hiltunen et al.[1])