Routine childhood vaccinations did not increase the risk of incident type 1 diabetes in Danish children

Hviid A, Stellfeld M, Wohlfahrt J, *et al.* Childhood vaccination and type 1 diabetes. *N Engl J Med* 2004;**350**:1398–404.

Q Are routinely administered childhood vaccines associated with an increased incidence of type 1 diabetes mellitus in a cohort of Danish children?

METHODS

Design: a cohort study of children followed up from birth to a mean age of 6.4 years.

Setting: Denmark.

Participants: 739 694 children born in Denmark from January 1990 to December 2000.

Risk factors: vaccinations with any of 6 groups of vaccines including *Haemophilus influenza* type b; diphtheria, tetanus, and inactivated poliovirus; diphtheria, tetanus, acellular pertussis, and inactivated poliovirus; whole cell pertussis; measles, mumps, and rubella; and oral poliovirus (data from vaccination reports of the National Board of Health). Sensitivity analyses considered the presence of a sibling with type 1 diabetes as a predisposing factor.

Outcomes: incidence of type 1 diabetes (from January 1990 to December 2001) (data from the Danish National Hospital Register).

MAIN RESULTS

The incidence of type 1 diabetes was 0.14 cases/1000 person-years among all children, and 6.2 cases/1000 person-years among those who had a sibling with type 1 diabetes. Routine childhood vaccinations were not associated with an increased incidence of type 1 diabetes mellitus among all children or among those who had a sibling with type 1 diabetes (table).

For correspondence: Mr A Hviid, Danish Epidemiology Science Centre, Statens Serum Institut, Copenhagen, Denmark. aii@ssi.dk

Sources of funding: Danish National Research Foundation and the Danish Medical Research Council.

CONCLUSION

Routinely administered childhood vaccines were not associated with an increased incidence of type 1 diabetes mellitus in a cohort of Danish children.

Commentary

The study by Hviid *et al* contributes new evidence refuting a correlation between childhood immunisations and development of type 1 diabetes. Although some studies have suggested a link,^{1–3} no other researchers have verified this, and recent reports and studies reject this theory.^{4–5}

The size of the cohort and the length of follow up add strength to the study conclusion. The authors estimated rate ratios, a statistical analysis that allows comparison of the incidence rates of a condition in 2 groups. In this case, the groups were defined according to vaccination status, which was considered to change over time, so that children in the study contributed person-years as both unvaccinated and vaccinated participants.

In addition, the authors considered whether a trend was associated with the number of vaccination doses. Children who had siblings with type 1 diabetes were considered as a subgroup because genetic susceptibility to type 1 diabetes is a well documented risk factor.^{6,7}

Although vaccination schedules vary among countries, the findings of this and other studies^{4–5} are relevant to all nurses providing advice to parents about childhood immunisation, particularly families where a strong genetic tendency to diabetes already exists. These families should be counselled that current evidence does not support a causal link between childhood vaccination and type 1 diabetes.

Judith Carrier, RGN, MSc, PGCE, Sp practitioner(PN)
School of Nursing and Midwifery Studies
Cardiff University
Caerleon, South Wales, UK

1 Classen DC, Classen JB. *Infect Dis Clin Pract* 1997;**6**:449–54.

2 Classen JB. *Autoimmunity* 1996;**24**:137–45.

3 Classen JB, Classen DC. *Autoimmunity* 2002;**35**:247–53.

4 Institute of Medicine. Immunizations safety review: multiple immunizations and immune dysfunction (2002). <http://www.nap.edu/books/0309083281/html/index.html>

5 DeStefano F, Mullooly JP, Okoro CA, *et al.* *Pediatrics* 2001;**108**:E112.

6 Cox NJ, Wapelhorst B, Morrison VA, *et al.* *Am J Hum Genet* 2001;**69**:820–30.

7 Diabetes UK. Research features: genetic research. Updated Feb 2003. <http://www.diabetes.org.uk/research/feature/reshome>

Association between routinely administered childhood vaccines and incident type 1 diabetes mellitus in Danish children at a mean age of 6.4 years*

Vaccine	Rate ratio (95% CI)	
	All children†	Children with ≥1 sibling with type 1 diabetes‡
<i>Haemophilus influenza</i> type b	0.91 (0.74 to 1.12)	1.38 (0.58 to 3.31)
Diphtheria, tetanus, and inactivated poliovirus	1.02 (0.75 to 1.37)	3.03 (0.41 to 22.63)
Diphtheria, tetanus, acellular pertussis, and inactivated poliovirus	0.96 (0.71 to 1.30)	1.36 (0.50 to 3.70)
Whole cell pertussis	1.06 (0.80 to 1.40)	1.68 (0.39 to 7.19)
Measles, mumps, and rubella	1.14 (0.90 to 1.45)	0.86 (0.34 to 2.14)
Oral poliovirus	1.08 (0.74 to 1.57)	2.01 (0.46 to 8.71)

*Rate ratios (comparing rates in children vaccinated with ≥1 dose v unvaccinated) show that all associations are not significant; CI defined in glossary.

†Rate ratios adjusted for age, calendar period, and sex.

‡Rate ratios adjusted for age, calendar period, sex, and number of siblings.