Effect of Pentavac and measles-mumps-rubella (MMR) vaccination on the intestine

B Thjodleifsson, K Davídsdóttir, U Agnarsson, G Sigthórsson, M Kjeld, I Bjarnason

Background: The safety of infant vaccination has been questioned in recent years. In particular it has been suggested that the measles, mumps, and rubella (MMR) vaccination leads to brain damage manifesting as autism consequent to the development of an “enterocolitis” in the immediate post-vaccination period.

Aim: To assess if MMR vaccination is associated with subclinical intestinal inflammation, which is central to the autistic “enterocolitis” theory.

Methods: We studied 109/58 infants, before and two and four weeks after immunisation with Pentavac and MMR vaccines, for the presence of intestinal inflammation (faecal calprotectin).

Results: Neither vaccination was associated with any significant increase in faecal calprotectin concentrations.

Conclusions: The failure of the MMR vaccination to cause an intestinal inflammatory response provides evidence against the proposed gut-brain interaction that is central to the autistic “enterocolitis” hypothesis.

SUBJECTS AND METHODS

Iceland has a developed health service with a centralised vaccination programme that results in infant vaccination rates approaching 100%. Pentavac (Pasteur Méérieux, France) vaccination (against diphtheria, tetanus, pertussis, polio, Haemophilus influenza type b) is performed at three, five, and 12 months of age and MMR (Priorix; SmithKline Beecham) vaccination at 18 months. One hundred and nine infants attending two of the vaccination centres of Southwest Iceland participated. These were consecutive infants where the parents had been sent a pre-attendance information leaflet explaining the nature and aims of the research. All of those approached participated. No infant met the predetermined specific exclusion criteria to this study which included those specified by the makers of the vaccines, the presence of intestinal diseases, or ingestion of medications that are associated with intestinal permeability-inflammation.

The infants were studied by measuring faecal calprotectin (Calprest, Calprotech Ltd, London, UK) one week before Pentavac (at 12 months of age) and MMR vaccines, for the presence of intestinal inflammation (faecal calprotectin).

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<th>Faecal calprotectin concentrations (mg/l) before and after Pentavac and measles-mumps-rubella (MMR) vaccination</th>
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There were no significant differences between calprotectin levels at the different time points and sequential studies showed no significant changes following vaccination.
intestinal pathology the postulated consequential effect on brain function. inflammation in the immediate post-vaccination period and controversial but rather highlight the possible role and effect after the vaccination. These data are not particularly age data) before vaccinations at 12 and 18 months of age are com-

Table 1 shows the median (range) values for faecal calprotectin concentrations in children undergoing immunisation. The upper limit of faecal calprotectin (110 mg/l; 95% confidence lim-

There was no evidence that either Pentavac or MMR vacci-

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RESULTS

### DISCUSSION

Naturally occurring measles viral infection has a predilection for the intestinal lymphoid tissue and may cause intestinal inflammation, which on occasions may resemble Crohn’s disease. The measles virus has controversially been implicated in the pathogenesis of Crohn’s disease and other diseases, including multiple sclerosis. The suggestion that the live attenuated measles vaccine might lead to ileocolonic inflammation with autistic features has caused equal interest. This hypothesis was formulated in an attempt to explain the high prevalence of “enterocolitis” in autistic children with Crohn’s disease activity in childhood inflammatory bowel disease.

Pathological intestinal inflammation is easily differentiated from normal as faecal calprotectin values are usually well in excess of 1000 mg/l under these circumstances. There was no evidence that either Pentavac or MMR vaccination provoked subclinical intestinal inflammation in any of our apparently healthy children during the four week post-vaccination period. This lack of a detectable intestinal inflammatory response suggests that the measles vaccine virus itself is not enterotoxic in healthy infants which argues against the MMR induced autitic “enterocolitis” theory. This does not however rule out the possibility that vaccination might have an adverse effect on susceptible infants that are perhaps immune compromised or with an immunological makeup that predisposes them to autoimmune disease.

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REFERENCES


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