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 Mérieux, 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 (at 18 months) vaccination, and two and four weeks later, respectively. Pentavac does not contain mercury, which has been proposed to predispose to the toxicity of MMR.

There were no significant differences between calprotectin levels at the different time points and sequential studies showed no significant changes following vaccination.
assay differs somewhat from many of the published ones, mainly in the extraction procedure and amount of stool required for assay (200 mg rather than 5 g). The Calprest method gives calprotectin values that are approximately five times higher than the older method, with improved sensitivity for the detection of intestinal inflammation in adults.

All parents provided written informed consent and the studies were approved by the National University Hospital Ethics Committee.

RESULTS
Table 1 shows the median (range) values for faecal calprotectin concentrations in infants. There were no statistically significant differences in faecal calprotectin concentrations at any time points (p > 0.25) (Friedman’s two way analyses of variance) or when assessed in subjects studied before and after Pentavac (p > 0.2) or MMR (p > 0.3) vaccination (paired Student’s t test on logarithmically transformed data which were normally distributed).

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 gastrointestinal symptoms. Consequent to the measles vaccine virus induced ileocolonic inflammation, it is suggested, there is increased intestinal permeation of a variety of intestinally derived neuroactive peptides that interfere with brain development.

In support of this hypothesis are reports of intestinal pathology and abnormal intestinal function in children with autism when examined a number of years after the vaccination. These data are not particularly controversial but rather highlight the possible role and effect of the measles vaccination virus in the development of this controversial but rather highlight the possible role and effect of the measles vaccination virus in the development of this controversy.

ACKNOWLEDGEMENT
The study was supported by the Science Fund of the University Hospital Hringbraut Reykjavik and by Wyeth Lederle.

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

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

Gut 2002 51: 816-817
doi: 10.1136/gut.51.6.816

Updated information and services can be found at:
http://gut.bmj.com/content/51/6/816

These include:

References
This article cites 28 articles, 4 of which you can access for free at:
http://gut.bmj.com/content/51/6/816#BIBL

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/