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

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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 (faecal calprotectin) before and after Pentavac and MMR vaccination in a group of infants.

Table 1 Faecal calprotectin concentrations (mg/l) before and after Pentavac and measles-mumps-rubella (MMR) vaccination

<table>
<thead>
<tr>
<th></th>
<th>Pentavac</th>
<th></th>
<th>MMR</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td>0 week</td>
<td>109</td>
<td>101</td>
<td>81</td>
</tr>
<tr>
<td>2 weeks</td>
<td>39</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>4 weeks</td>
<td>1-218</td>
<td>1-295</td>
<td>1-292</td>
</tr>
<tr>
<td>Median Range</td>
<td>1-273</td>
<td>1-273</td>
<td>1-292</td>
</tr>
</tbody>
</table>

There were no significant differences between calprotectin levels at the different time points and sequential studies showed no significant changes following vaccination.
intestinal pathology
of the measles vaccination virus in the development of this
after the vaccination. These data are not particularly
age
parable with published data in normal infants of the same
data) before vaccinations at 12 and 18 months of age are com-
itits (2 SD) calculated from logarithmically transformed mean
MMR vaccination leads to subclinical intestinal inflammation
post-vaccination period. This lack of a detectable intestinal
our apparently healthy children during the four week
nation provoked subclinical intestinal inflammation in any of
Ethics Committee.

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 ileocecal inflammation in the 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 vac-
cine virus induced ileocolonic inflammation, it is suggested, there is increased intestinal permeation of a variety of intesti-
nally 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 inflammation in the immediate post-vaccination period and the postulated consequent effect on brain function.

In this study we specifically assessed the possibility that MMR vaccination leads to subclinical intestinal inflammation in infants undergoing immunisation. The upper limit of faecal concentrations of calprotectin (110 mg/l; 95% confidence limits (2 SD) calculated from logarithmically transformed mean data) before vaccinations at 12 and 18 months of age are comparable with published data in normal infants of the same age and are twice as high as those reported in healthy adults. Pathological intestinal inflammation is easily differenti-
nated 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 vacci-
nation 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 autistic “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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