

Measles, mumps, rubella vaccine, inflammatory bowel disease and autism

Recent media reports have suggested a link between the measles, mumps, rubella (MMR) vaccine, bowel inflammation and autism. No reliable evidence supports a link. This fact sheet provides background information for health professionals and parents.

What is Inflammatory Bowel Disease (IBD)?

IBD is a group of chronic inflammatory disorders of the small and large bowel, the commonest being ulcerative colitis and Crohn's disease. The cause of IBD is not understood, but an immune mechanism as well as a genetic predisposition are likely. IBD is relatively rare, and usually occurs in people aged between 15 to 30 years, but can also occur in children. Common symptoms include diarrhoea, fever, stomach pain and weight loss.

What is autism?

Autism is a developmental disorder that is usually identified between 18 months and three years of age. Autism is four times more common in boys than girls and occurs in all racial and social groups. Children and adults with autism typically have difficulties in verbal and non-verbal communication, social interactions, and leisure or play activities. A single cause of autism has not been identified, but current research links it to developmental, genetic and environmental factors.

Many children have some of the features of autism but do not fulfil all the diagnostic criteria. Because of this, terms such as "Pervasive Developmental Disorder" (PDD) and Autism Spectrum disorder are sometimes used.

What is MMR vaccine?

Measles, mumps, rubella (MMR) vaccine is a live virus vaccine which protects against these three diseases through use of modified types of measles, mumps and rubella viruses. They protect against natural infection without causing disease themselves. The Australian National Health & Medical Research Council (NHMRC) recommends MMR for all children at 12 months of age and again at 4 years of age.

Does vaccination with MMR cause IBD and or autism?

In 1993, a group of researchers led by Dr Wakefield at the Royal Free Hospital, London, suggested an association between both the natural and vaccine types of measles virus and IBD based on a study of 25 children with Crohn's disease (compared to 22 well children). In 1998 researchers from the same group reported the occurrence in 12 children of an apparently new syndrome of an unusual type of IBD in association with developmental disorders such as autism. In 2002 Uhlmann, Wakefield and others published a study showing a higher rate of measles virus in the bowel of autistic children with bowel symptoms, compared to a group of children without autism.

The researchers suggested that MMR vaccine caused IBD, which then resulted in decreased absorption of essential vitamins and nutrients through the intestinal tract. They suggested that this resulted in developmental disorders such as autism. In 2001, Wakefield modified his theory, proposing that MMR could cause "regressive autism" with "autistic enterocolitis". This included worsening of autistic symptoms in children already diagnosed with autism. This, he said, could occur a long time after MMR vaccine, and required other contributing factors (such as another infection, antibiotic therapy, or diseases of the immune system).

Medical and scientific experts who have reviewed Wakefield's studies have found them to have several flaws. Primarily the studies were conducted on highly selected patients, all referred to the Royal Free

Hospital for gastrointestinal ailments. If IBD causes autism, one would expect IBD to occur first, followed by autism. In only 1 of the 12 patients did the symptoms of bowel disease precede the diagnosis of autism. In 4 cases, autism preceded the bowel symptoms, and in the remainder, the date of onset of bowel symptoms was unknown. Such a case series analysis is unable to determine causal links.

Furthermore, the association between vaccine and autism was primarily based on parental recall. Parents are likely to have linked changes in behaviour with memorable events such as vaccination. The onset of autism and MMR vaccination may coincidentally appear associated in time because the average age at which parents report concerns about child development is 18 to 19 months, and over 90% of children receive MMR vaccine before their second birthday in the UK. Epidemiologic studies have found no evidence to support Wakefield's recently modified theory of "regressive autism".

These data presented in the 2002 study by Uhlmann and others have not been reproduced by any other laboratory as yet. The validity of this study is difficult to assess because the study does not report key information on the characteristics and the method of selection of the cases and controls and on laboratory methods. In addition, controls were not matched for gender (which is a known risk factor for autism) or age. The authors did not set out to look at the role of MMR vaccination, and the vaccination status of the children in the study is not known.

What do other studies show?

More thorough, large epidemiological studies, including an English population-based study of the vaccination status of 498 children with autism, and rates of IBD and autism among 6100 French school-aged children, have found no evidence of an association. US and UK studies found no correlation between trends in early childhood MMR immunisation rates and trends in autism. A large prospective study of adverse events following MMR in Finland followed 1.8 million children for 14 years after MMR vaccination and found no cases of autism. Other studies have found that the proportion of children with developmental regression or bowel symptoms, and the age at which parents first became concerned about their children, was the same in children who received MMR and those who did not. This provides no support for Wakefield's modified hypothesis.

Laboratory studies (by Iizuka et al. and Haga et al. in Japan) using a similar methodology to Wakefield et al. did not find any measles virus in patients with IBD. Other groups using more sensitive testing methods have not found any evidence of measles virus in the gastrointestinal tract of patients with Crohn's disease or ulcerative colitis

What do the experts conclude?

Reviews by Canadian and World Health Organization experts have concluded that 'current scientific data do not permit a causal link to be drawn between the measles virus and IBD'. In 1998 Sir Kenneth Calman, British Chief Medical Officer, convened a meeting of the Medical Research Council and a group of national and international experts, including the World Health Organization, to review the work of Wakefield and the Royal Free Hospital IBD study group. The meeting concluded that based on current evidence 'there is no link between measles, measles vaccine, and either Crohn's Disease or autism'.

Is there any benefit in giving the component vaccines separately?

There is no evidence that giving the vaccine components of MMR separately is of any benefit. In fact, giving them separately may even be harmful because children and their contacts would be exposed to serious diseases over a longer period of time if the vaccines are given sequentially. National and international expert bodies, including The NHMRC, the World Health Organization, the Institute of Medicine, and the American Academy of Pediatrics, all independently recommend that MMR should continue to be used. At present, only the rubella vaccine is available separately in Australia.

Further reading see - www.nevdgp.org.au/mmr_autism_ref.htm