Association between MMR vaccine and Autism: Issue of Argument.

The MMR Vaccine (Measles, Mumps, Rubella) is a live attenuated virus vaccine. Its efficacy is 95% (Range 90-98%), giving lifelong immunity. It is scheduled as 2 doses; once at 12 months, and another at 4-6 years.

Autism is one of a group of disorders known as autism spectrum disorders (ASDs). They are developmental disabilities that cause substantial impairment in social interaction and communication and the presence of unusual behaviors and interests. The severity of Autism varies greatly, from little speech and poor daily living skills, to functioning well in most settings. Its onset is usually before 3 years of age, and lasts throughout a person's life. It can occur in all racial, ethnic, and socioeconomic groups and are four times more likely to occur in boys than in girls. Causes of Autism remain unknown, although both genetic and environmental factors are implicated.[1]

In 1998, a paper published in The Lancet by Dr. Andrew Wakefield et al. suggested that the MMR vaccine could contribute to the development of autism.[2] This paper caused a lot of media attention, and many parents consequently refused MMR for their children. The MMR-autism theory is based on the idea that intestinal problems, such as Crohn's disease, are the result of viral infection, and can contribute to the development of autism. In 1993, Wakefield et al. reported isolating measles virus in the intestinal tissue of persons with Inflammatory Bowel Disease (IBD). However, the validity of this finding was later brought into doubt when it could not be reproduced by other researchers.[4,5]

The 1998 Wakefield study[2] reviewed reports of children with bowel disease and regressive developmental disorders, mostly autism, and suggested that MMR vaccine led to intestinal abnormalities resulting in impairment of intestinal function and developmental regression within 24 hours to a few weeks of vaccination. This hypothesis was based on only 12 children, which are too few to allow generalization of results. Also, they were referred to the researchers and may therefore not be a representative sample of autism cases; there was no healthy comparison group; and in at least 4 of the 12 cases, behavioral problems had appeared before IBD symptoms.

Taylor et al in 1999 published a study that argued against the suggested link between autism and the MMR vaccine. This study looked at all the known cases of ASD in children living in certain districts of London who were born in 1979, or after. The ASD patients were then matched with an independent registry of vaccinations. Among 498 children with autism, it was determined that the age at diagnosis was the same regardless of whether the children had received the MMR vaccine before or after 18 months of age, or whether they had never been vaccinated.[6]

In 1999, the British Committee on Safety of Medicine conducted a systematic review of reports of autism and GI diseases after receipt of MMR vaccine. They concluded that the available information did not support any association between the vaccine and autism or other diseases.[7]

In 2002, Madsen et al. conducted a study among all children born in Denmark from January 1991 up to December 1998.[8] The total number was 537,303 children, among who 440,655 had been vaccinated with the MMR vaccine. The researchers did not find a higher risk of autism among vaccinated children. Although there were a much higher number of vaccinated children in the study group, the sample was large enough to have a higher statistical power than previous studies that had suggested the association between MMR and autism, thus providing much stronger evidence.

DeStefano et al. investigated whether there was a difference in the age at which children with autism and without autism received their first MMR vaccination. The study's findings showed that children with autism received their MMR at similar ages as children without autism.[9]

Should we delay vaccination until we know more about the negative effects of the vaccine? The answer is no, since current epidemiological evidence does not support a causal link between MMR vaccine and autism.

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References:

1. Boyle C, Van Naarden Braun K, Yeargin-Allsopp M. The Prevalence and the Genetic Epidemiology of Developmental Disabilities. In: Genetics of Developmental Disabilities. Merlin Butler and John Meany eds. 2004 (Table 3, p. 716-717).
2. Wakefield AJ et al. Ileal-Lymphoid-Nodular Hyperplasia, Non-Specific Colitis, and Pervasive Developmental Disorder in Children. Lancet 1998; 351(9103):637-41
3. Wakefield AJ et al. Evidence of Persistent Measles Virus Infection in Crohn's Disease. J Med Virol 1993; 39(4):345-53.
4. Afzal MA et al. Absence of Detectable Measles Virus Genome Sequence in Inflammatory Bowel Disease Tissues and Peripheral Blood Lymphocytes. J Med Virol 1998; 55(3):243-9.
5. Nielsen LL et al. Exposure to Measles in Utero and Crohn's Disease: Danish Register Study. BMJ 1998; 316(7126):196-7.
6. Taylor B et al. Autism and Measles, Mumps, and Rubella Vaccine: No Epidemiological Evidence for a Causal Association. Lancet 1999; 353 (9169):2026-9
7. British Committee on Safety of Medicine "Working Party on MMR Vaccine". Systematic review of reports of autism and GI diseases after receipt of MMR vaccine. Medicines Commission Agency, 1999.
8. Madsen KM et al. A Population-Based Study of Measles, Mumps, and Rubella Vaccination and Autism. N Engl J Med 2002; 347(19):1477-82.
9. DeStefano F et al. Age at First Measles-Mumps-Rubella Vaccination in Children with Autism and School-Matched Control Subjects: A Population-Based Study in Metropolitan Atlanta. Pediatrics 2004; Vol. 113(2): 259-66.