MedicalXpress

Study shows no connection between measles, mumps, rubella (MMR) vaccine and autism

September 4 2008

In a case-control study, the presence of measles virus RNA was no more likely in children with autism and GI disturbances than in children with only GI disturbances. Furthermore, GI symptom and autism onset were unrelated to MMR vaccine timing.

Prior to the implementation of measles vaccines in 1963, three to four million people were newly infected each year, 400-500 died, 48,000 were hospitalized, and 1,000 developed chronic disability from measles encephalitis. From January 1 through July 2008 the Centers for Disease Control and Prevention received 131 reports of confirmed measles virus infection in the U.S., the highest number for the same time period since 1996. Of these 131 cases, 91% occurred in individuals who had not been vaccinated or had unknown vaccination status.

In 1998, a report of the presence of measles virus RNA in intestinal tissue from children with autism spectrum disorders and GI disturbances (Wakefield et al.) resulted in public concern over the safety of MMR vaccine. Although epidemiological investigations found no associations between MMR vaccine and autism, no subsequent studies tested for the presence of viral RNA in GI tissues of children with autism and GI disturbances or examined the temporal relationship of MMR, GI disturbances, and autism. Failure to have done so may have contributed to persistent concerns that have influenced vaccine acceptance rates, resulting in outbreaks of measles.

Scientists at Columbia University Mailman School of Public Health's

Center for Infection and Immunity and researchers at the Centers for Disease Control and Prevention, Massachusetts General Hospital, and Trinity College Dublin, evaluated bowel tissues from 25 children with autism and GI disturbances and 13 children with GI disturbances alone (controls) by real-time reverse transcription (RT)-PCR for the presence of measles virus RNA. Samples were analyzed in three laboratories blinded to diagnosis, including one wherein the original findings suggesting a link between measles virus and autism had been reported.

"Our results are inconsistent with a causal role for MMR vaccine as a trigger or exacerbator of either GI difficulties or autism," states Mady Hornig, associate professor of Epidemiology and director of translational research in the Center for Infection and Immunity in the Mailman School, and co-corresponding author of the study. "The work reported here eliminates the remaining support for the hypothesis that autism with GI complaints is related to MMR vaccine exposure. We found no relationship between the timing of MMR vaccine and the onset of either GI complaints or autism."

Analysis in all three laboratories found two biopsy samples with measles virus RNA, one from a boy in the autism/GI group and the other from a boy in the control group, showing that the presence of measles virus sequences was not associated with an autism diagnosis (autism/GI group, 4%; control, 8%).

The temporal order of onset of GI episodes and autism relative to timing of MMR vaccine administration was examined as well. If MMR is causally related to either GI disturbances or autism it should precede their onset. Analysis indicated no role for MMR vaccine in either the pathogenesis of autism or GI dysfunction. Only five of 25 subjects (20%) had received MMR vaccine before the onset of GI complaints and had also had onset of GI episodes before the onset of autism.

"Over 20 epidemiologic studies have reported no temporal relationship between MMR vaccine and autism, however, no published studies from other research groups have addressed whether measles virus RNA is present in bowel of autistic children with GI disturbances. Here we report results of independent, blinded testing in this particular subgroup for the presence of measles virus RNA in bowel tissues," says corresponding author W. Ian Lipkin, John Snow Professor of Epidemiology and director of the Mailman School's Center for Infection and Immunity.

He adds, "The study design process was a critical piece for us, as there is still so much public concern over the safety of the MMR vaccine. For this reason, we involved the autism parent/advocacy community as we designed the study to ensure that all issues were being addressed. We are hopeful that this process of community engagement will build important partnerships among members of the autism community, physicians, public health agencies, and clinical researchers; serve as a paradigm for the conduct of future studies to understand the causes of this disorder; and facilitate the rapid communication of clinically relevant scientific findings to the broader community."

Study findings are reported online in the *Public Library of Science* on September 4 (http://dx.plos.org/10.1371/journal.pone.0003140).

Source: Columbia University's Mailman School of Public Health