

Gene link to seizures in children after MMR vaccine

26 October 2014, by Richard Ingham

Scientists in Denmark said Sunday they had found genetic clues to explain why a small number of children have febrile seizures—brief convulsions—after receiving the measles, mumps and rubella (MMR) vaccine.

They stressed there was no need to scrap the MMR vaccine—caught in a health scare in 1998 that watchdogs later declared groundless—and described its use as a "great achievement" in saving lives.

Reporting in the journal *Nature Genetics*, the team found that febrile seizures occurred in roughly one in every 1,000 children who were given the MMR vaccine.

Two genetic variants came to light that pointed to a higher risk of a febrile seizure in the second week following MMR vaccination, they said.

They lie on genes that play an important role in how the immune system reacts to viral intruders.

Febrile seizures are the term for when a child develops a high temperature, loses consciousness and spasms.

The episode usually lasts for a minute or two, but apart from causing alarm for parents and the need for a checkup afterwards, is typically not dangerous.

A known but rare side effect of vaccination or viral infection, febrile seizures are different from [epileptic seizures](#), which occur without fever.

In addition, four other variants were found that link to febrile seizures in general, and have no connection with the MMR vaccine.

These four lie on genes that help to govern ion channels, an essential communications link between nerve cells.

Children who had the highest tally of the four variants were almost four times likelier to have febrile seizures than counterparts with the least number.

The six variants are unlikely to account for more than just a small proportion of the genetic causes for seizures, the researchers said.

Further work should tease out other genetic culprits, hopefully leading to a diagnostic test to show which children could be at greater risk of a febrile seizure after a jab.

The study was unable to say whether children who had seizures did so as a result of getting a triple immunisation, as opposed to getting single shots to protect against the three diseases. The triple vaccine is the only available in Denmark.

In addition, the gene trawl was only carried out in Denmark, and it is unknown whether the same risk exists, or exists to the same degree, in children elsewhere.

Vaccine improvement

Lead scientist Bjarke Feenstra at the Statens Serum Institut in Copenhagen said the research should throw up new pathways for exploring [febrile seizures](#).

As far as the MMR vaccine is concerned, it could improve an already good and safe vaccine, he said in an email exchange with AFP.

"The MMR vaccine is a great public health success, estimated to prevent the death of more than one million children worldwide per year," he said.

"The knowledge gained from studies like ours may ultimately lead to even safer vaccines."

In 1998, a study published in the British journal *The*

Lancet unleashed a scare that the triple vaccine caused autism.

Even though the allegation was scientifically debunked and the study was later withdrawn, fears about the MMR [vaccine](#) persisted, prompting some parents to refuse immunisation for their child.

That in turn reduced "herd immunity"—the protection that comes when everyone is vaccinated—and placed non-immunised [children](#) at risk.

More information: Common variants associated with general and MMR vaccine–related febrile seizures, *Nature Genetics*, [dx.doi.org/10.1038/ng.3129](https://doi.org/10.1038/ng.3129)

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