Dengue infection: A shield against Zika-related birth defects

July 8 2019

Credit: AI-generated image (disclaimer)

The Zika virus outbreak in Latin America less than 5 years ago had severe consequences for expectant mothers. Many who were infected with the Zika virus gave birth to children with microcephaly and other birth defects, collectively referred to as congenital Zika syndrome (CZS). For some reason, the incidence of CZS was highest in north-east

Brazil.

Why was the chance of developing a severe Zika-related disease greater in this region than in others? Seeking to answer this question, scientists working on the EU-funded ZIKAlliance project began to search for contributory causes that might affect whether a Zika infection during pregnancy resulted in congenital malformations or not.

Initially, the researchers suspected the dengue virus as a likely factor. This mosquito-borne virus that causes dengue fever is widespread in Latin America. The scientists assumed that the antibodies produced in the body after contracting dengue fever contributed to the foetal malformations resulting from a subsequent Zika infection.

The researchers were both right and wrong. Yes, the dengue virus did play a role. However, its contribution wasn't quite what had been expected. Their ahead-of-print article in the *Emerging Infectious Diseases* journal describes their unforeseen results. "Surprisingly, our study has shown that a previous dengue infection can protect against Zika-associated damage," explained Prof. Jan Felix Drexler of project partner Charité – Universitätsmedizin Berlin in a news release posted on "EurekAlert!".

Studying the dengue virus's role

In their study, the ZIKAlliance scientists first compared the genomes of all known dengue viruses in Brazil. However, their results provided no evidence of a unique dengue virus signature that would explain the uneven spread of CZS cases and their higher incidence in the north-eastern part of the country. The project team then conducted a case-control study to compare 29 mothers of children born with CZS with 108 mothers of children born without any birth defects. The mothers, who were from Salvador in north-east Brazil, all had evidence of earlier

exposure to the Zika virus.

The results indicated that there were much lower levels of dengue virus pathogens and neutralised serotypes in mothers of children born with CZS. This suggested that rather than enhance the development of Zika-related congenital malformations, dengue virus infection may in fact offer protection against it. "We can now say that people who have had early infections with dengue do not need to worry much about contracting more severe forms of Zika infection due to this," stated Prof. Drexler.

Therefore, the dengue virus was ruled out as a contributory cause of congenital Zika-associated malformations. ZIKAlliance (A global alliance for Zika virus control and prevention) will now be conducting further research to identify factors that increase the chances of microcephaly in newborn infants. The 4-year project concludes in September 2020.

More information: ZIKAlliance project website: zikalliance.tghn.org/

Provided by CORDIS