Pregnancy problems not necessarily tied to Zika viral load or Dengue fever

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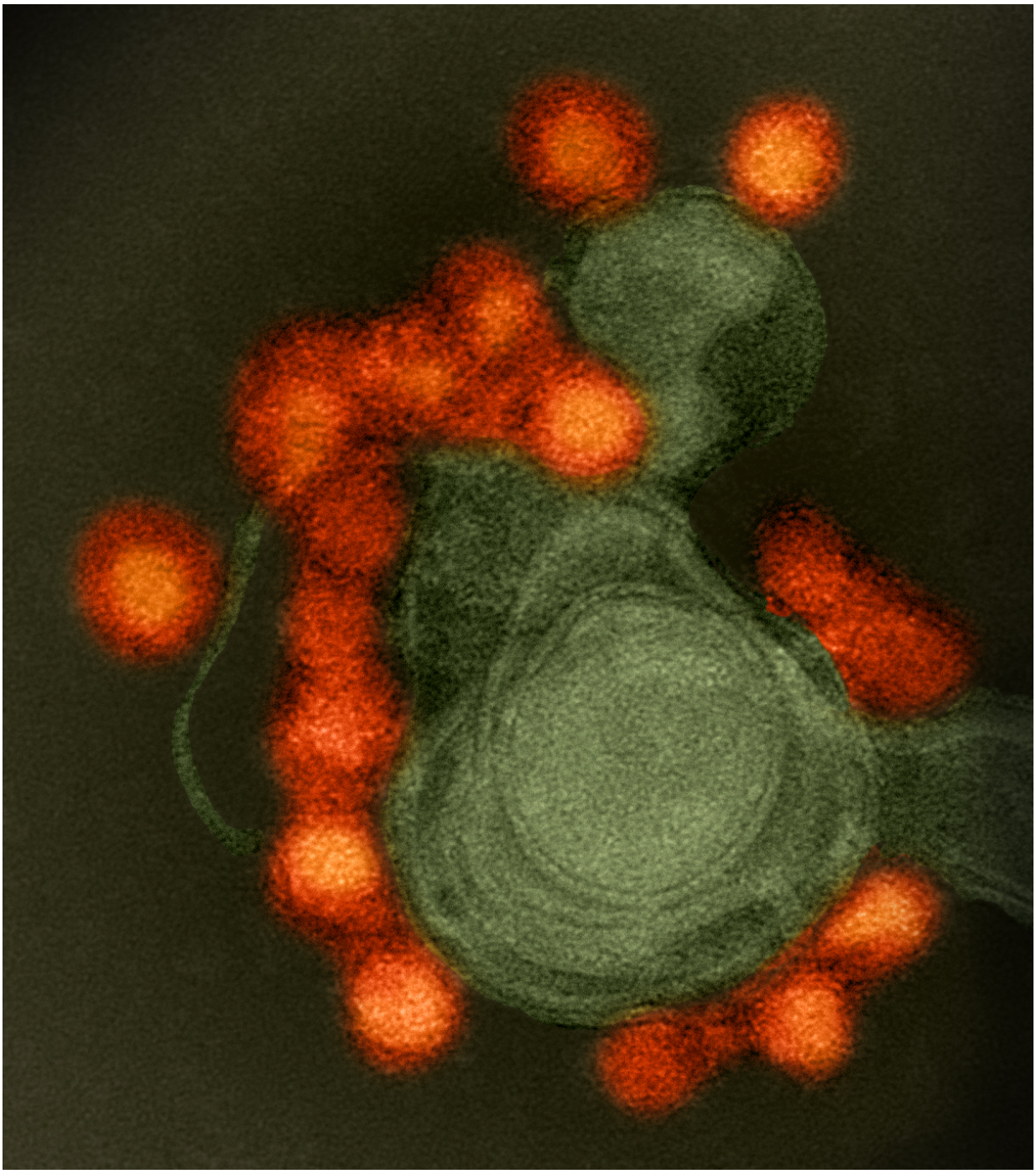

Transmission electron microscope image of negative-stained, Fortaleza-strain Zika virus (red), isolated from a microcephaly case in Brazil. The virus is associated with cellular membranes in the center. Credit: NIAID

UCLA-led researchers have found that Zika viral load and the degree of Zika symptoms during pregnancy were not necessarily associated with problems during pregnancy or fetal abnormalities at birth. They also found that the presence of antibodies to previously acquired dengue fever was not necessarily connected to abnormalities during pregnancy or at birth.

Congenital Zika virus syndrome—a pattern of birth defects found among fetuses and babies infected with the virus—is a newly identified condition that occurs when women are infected during pregnancy. It is unknown to what degree the amount of Zika virus in the mother, the extent of Zika symptoms or the presence of prior dengue antibodies contribute to the syndrome. Laboratory studies suggest there is a phenomenon called antibody dependent enhancement, in which the presence of pre-existing dengue antibodies would enhance Zika's virulence, increasing risk to the fetus. Clinical studies, however, have found no evidence of this. It has also been unclear whether a high viral load, or the presence of Zika symptoms, would be associated with risk of harm to the fetus, or if there is a direct relationship between the amount of virus in the blood and severity of symptoms in the mother.

Researchers developed an assessment tool to gauge severity of symptoms based on duration of fever, degree of rash, how many parts of the body were affected and duration of symptoms during Zika infection. Zika viral load was quantified by a molecular assay (polymerase chain reaction) in blood and urine. Dengue antibodies were measured at the time patients presented with Zika symptoms for the first time, as a way of assessing pre-existing immunity to dengue.

The researchers defined adverse outcomes as the death of the fetus or a live infant with severe abnormal clinical or brain imaging findings.

They analyzed possible associations between the amount of Zika in the

blood or urine and severity of symptoms; viral load and health of the infant; and severity of symptoms and infant health. Researchers also evaluated whether patients who had laboratory evidence of prior dengue infection had worse or better infant health, more or fewer symptoms of Zika or a higher Zika viral load.

Of 131 pregnant women infected with Zika virus, 4.6 percent had mild disease, 74.8 percent had moderate disease and 20.6 percent had severe manifestations of Zika infection. Of the 125 women who reported for follow-ups 46.4 percent had abnormal pregnancy outcomes with nine fetal deaths.

erse outcomes. In addition, though 88 percent of the women had antibodies to prior dengue infection, the researchers found no positive or negative association between prior immunity to dengue with Zika severity score, Zika viral load or poor infant health or death.

The findings demonstrate that the amount of Zika virus identified in a woman does not necessarily correlate with significant symptoms or fetal harm. This is different from many infections, where more virus may mean more severe symptoms or, in the case of HIV, transmission to the baby. But more studies are needed with a larger sample size of patients without prior dengue infection.

The study was published by the peer-reviewed journal *Clinical Infectious Diseases*.

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