

Press release

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Fetal MRI demonstrates impaired fetal lung growth in otherwise healthy SARS-CoV-2 infected pregnancies

By the use of fetal magnetic resonance imaging (MRI), scientists and physicians from LMU University Hospital Munich and Helmholtz Munich have discovered a reduction in lung volume in fetuses from mothers with an uncomplicated SARS-CoV-2 infection during pregnancy. The reduction in lung volume that was shown in comparison to a non-COVID reference cohort, was particularly marked if the infection occurred in the final trimester of pregnancy. The data were collected before vaccination against SARS-CoV-2 became available. The results of the study are published in The Lancet Respiratory Medicine.

Led by Professor Sophia Stoecklein, Department of Radiology (LMU University Hospital Munich) and PD Dr. Anne Hilgendorff, Centre for Comprehensive Developmental Care (LMU University Hospital Munich) and Helmholtz Munich, researchers examined a total of 34 pregnant women and fetuses using fetal MRI. The women were infected with the SARS-CoV-2 Alpha variant at different stages during pregnancy, as confirmed by PCR testing. Fetal MRI is a highly specialized prenatal imaging method that enables the detailed evaluation of fetal organs and tissue, demonstrating a reduction in lung volume in fetuses from SARS-CoV-2 pregnancies – as compared with fetuses from an uninfected reference cohort.

“The fetuses of pregnant women who tested positive for SARS-CoV-2 had an overall lower lung volume compared to the reference cohort,” says Professor Stoecklein. The effect was particularly pronounced in third-trimester fetuses, where an average of 69 percent of the expected average for normal lung volume was noted.

One possible explanation for this phenomenon could be the transfer of the virus across the placenta into the amniotic fluid, and into the fetal lungs. “A particular characteristic of lung development in the third trimester is the



maturation of important cells at the gas exchange surface,” explains Dr. Hilgendorff. “If these cells are exposed to the virus, their developmental trajectory, an important part of structural and functional lung maturation, could be altered.”

However, the newborns appeared healthy at birth with no detectable respiratory distress or other abnormalities during postnatal adaptation. In order to assess the extent to which reduced fetal lung volume could impact future organ development, the researchers now want to track these children in a follow-up study assessing critical parameters of lung development and potential disease until their 2nd and 5th year of life by the use of questionnaires and potential imaging. The researchers emphasize the general need for longitudinal follow-up studies – with a focus on pulmonary and neurological development – for children exposed to SARS-CoV-2 during pregnancy. “The results of our study can be seen as a supporting factor that might reinforce the recommendation for vaccination during pregnancy,” the researchers state.

Publication

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