

New discovery offers hope of protecting premature babies from blindness

February 9 2018



ROP Screening. Credit: University of Gothenburg

Now there is hope of a new way to protect extremely premature babies from impaired vision or blindness resulting from the eye disease retinopathy of prematurity (ROP). A study at Sahlgrenska Academy published in *JAMA Ophthalmology* points to a clear link between ROP and low levels of the fatty acid arachidonic acid, measured in children's blood.

"Seeing such a strong connection between [arachidonic acid](#) levels and ROP is something that is entirely new. However we looked at the data, it's always low levels of arachidonic [acid](#) that is most clearly associated with the disease," says Chatarina Löfqvist, an associate professor in experimental ophthalmology and the first author of the article.

"What we believe and hope is that providing the [children](#) with arachidonic acid will raise the levels and reduce the amount of ROP to minimize the risk of children becoming blind," she continues.

Every year thousands of children in Sweden are screened for ROP, a disease that afflicts extremely premature babies whose [retinal blood vessels](#) have not fully developed. The children can be visually impaired, and in the worst cases become blind, due to retinal detachment.

Consequently, finding biomarkers for the disease has been an important goal. In the current study researchers investigated the levels of about 20 different fatty acids in the [blood](#) of 90 children born before 28 weeks of pregnancy at Sahlgrenska University Hospital in Gothenburg.

The fact that arachidonic acid so clearly stood out surprised the research team led by Professor Ann Hellström. The fatty acid belongs to the omega-6 polyunsaturated fatty acid family, which at high levels is associated with inflammation and heart [disease](#) in adults. During the

fetal period, however, the situation may be different.

"Arachidonic acid seems to be of special importance during the whole pregnancy as a building block for membranes," Ann Hellström says.

"The mother provides the fetus with arachidonic acid, which is at a much lower level in her own blood compared to the fetal levels.

Therefore, we believe that it's important that the premature babies receive this fatty acid as a supplement."

The hypothesis will now be tested in a new study involving 210 children at neonatal units in three Swedish cities; Gothenburg, Lund and Stockholm. Children will be given a supplement with a combination of DHA, an omega-3 polyunsaturated fatty acid, which is also important for the construction of blood vessels and nerve tissue, and arachidonic acid, an omega-6 polyunsaturated fatty acid. At present the latter is not included in the nutritional supplements that premature babies receive immediately after birth.

"Many times new treatments are introduced on the basis of intuition and opinion, but the evidence is not always there," Ann Hellström observes.

"Now we have something entirely new to go on, a fatty acid that we had not at all expected to be important in fetal growth. However we found it by systematically surveying all [fatty acids](#) to find evidence of which were involved in development in both healthy and sick infants."

More information: Chatarina A. Löfqvist et al. Association of Retinopathy of Prematurity With Low Levels of Arachidonic Acid, *JAMA Ophthalmology* (2018). [DOI: 10.1001/jamaophthalmol.2017.6658](https://doi.org/10.1001/jamaophthalmol.2017.6658)

Provided by University of Gothenburg

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