Disturbance during foetal period behind severe eye disease

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(Medical Xpress) -- The congenital eye disease persistent foetal vasculature syndrome leads to bleeding, detached retina, and a cloudy lens. Now researchers at Uppsala University show in a model for the disease that it may be associated with an excessive expression of a growth factor during the foetal period.

During the foetal period, temporary blood vessels, so-called hyaloid vessels, play an important role for the development of the eye. In normal foetal development these blood vessels regress and disappear apace with the formation of the retina's real blood vessels. If the regression of the temporary blood vessels does not take place, defects arise in the eye, leading to the uncommon but severe disease persistent foetal vasculature syndrome, PFVS.

In a study published by the scientific journal *PLoS ONE* researchers at Uppsala University in Sweden and the University of Murcia in Spain show that the disease can be linked to disturbances in growth signals during the foetal period.

"The symptoms result from an excess of the growth factor PDGF, which prevents the temporary blood vessels of the foetal stage from disappearing, which in turn prevents normal development of blood vessels in the retina," says Karin Forsberg Nilsson, professor at the Department of Immunology, Genetics and Pathology at the Rudbeck Laboratory, who directed the study.

The finding is based on studies of mice with altered levels of the growth factor PDGF in neural stem cells, which play a key role in the development of the eye. In mice with an altered level of the growth factor, there was no regression of the temporary blood vessels. Instead major defects arose during retina development including severely impaired blood-vessel development. The symptoms could be alleviated when the growth factor was blocked.

"In humans PFVS can lead to bleeding in the eye – because the vessels leak, cloudy lens – so-called cataract, and detached retina. We see major similarities with the disease," says Karin Forsberg-Nilsson.

These finding means that there is now a model for studying the eye disease in greater detail, which can lead to more effective treatment.

More information: dx.plos.org/10.1371/journal.pone.0042488

Provided by Uppsala University

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