Gastroschisis – from pathogenesis to long-term follow-up

Half time review seminar, June 12 2020, 9.00 am
Conference room 4, The Seminar Building

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BACKGROUND

Gastroschisis (GS) is the most common congenital abdominal wall defect (AWD) with an incidence of 3-4/10 000 live births. One theory about the pathogenetic mechanism implies failure of the yolk sac structures to merge with the umbilical cord in early embryologic development, but this has not been confirmed. A genetic cause is suggested in a minority of cases, but so far, a specific mutation has not been described in humans. The short-term morbidity and mortality are well described, however, the effects of the disease in a long-term perspective are not as well documented.

AIM/METHOD

The aim of this thesis is to advance our understanding of on the pathogenesis of the malformation, and of the long-term morbidity and mortality in GS patients. Study 1-3 aim to investigate genetic and microscopic findings in knock-out mice and in humans in the search for pathogenetic mechanisms. Study 4 and 5 aim to compile information on long-term consequences of GS through a systematic review with meta-analysis and a registry study.

PRELIMINARY RESULTS

In study 1, a knock-out mouse with AWD was described and compared to AWD mouse models in the literature. The differences in appearance of abdominal wall defects in mice and humans indicate that the malformation arises in a part of the abdominal wall development where the species differ, for example the involution of the yolk sac structures to the umbilical cord.

In study 2, the prevalence of yolk duct remnants in the umbilical cords of non-GS patients was examined with the intent to collect umbilical cords from GS patients for comparison. Yolk duct remnants were found in less than 2% and according to our power calculation 150 GS umbilical cords will be required to detect a significant difference.

In study 4, the systematic review on long-term follow-up of GS patients includes 109 eligible articles, currently under revision with the intent to perform a meta-analysis.

SIGNIFICANCE

In-depth knowledge of the cause and prognosis of GS is crucial both in parental pre- and neonatal counseling and in future care and follow-up of GS patients.

PUBLISHED PAPERS

Dermatan Sulfate Epimerase 1 Deficient Mice as a Model for Human Abdominal Wall Defects.

Changes in the Prevalence of Embryologic Remnants in Umbilical Cord with Gestational Age.
Grottling E, Gisselsson D.