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Risk factors for congenital hydrocephalus: a nationwide, register based cohort study

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Objectives: To investigate the associations between isolated CHC and maternal characteristics, maternal medical diseases, and medicine intake during pregnancy as well as birth characteristics of the child in a retrospective, register based nationwide cohort study. Furthermore, to identify the risk factors unique for isolated CHC as compared to syndromic CHC.

Methods: We established a cohort of all children born in Denmark between 1978 and 2008. Information on CHC and maternal medical diseases were obtained from the National Patient Discharge Register, maternal intake of medicine during pregnancy from the National Prescription Drug Register, and birth characteristics of the child from the Danish National Birth Register. Rate ratios (RR's) of isolated and syndromic CHC with 95% confidence interval (CI) were estimated using log-linear Poisson regression.

Results: In a cohort of 1,928,666 live born children, we observed 1,193 cases of isolated CHC (0.062/1000 born children). First born children had an increased risk of isolated CHC compared to later born children (1.32 95% CI: 1.17-1.49) (0.72/1000 born children). First trimester exposure to maternal use of antidepressants was associated with a significantly increased risk of isolated CHC compared to unexposed children (RR 2.52, 95% CI: 1.47-4.29) (1.5/1000 born children). Risk factors also found for syndromic CHC were: Male gender, multiples, and maternal diabetes.

Conclusions: The higher risk for isolated CHC in first born children warrants further investigation. Potential biological pathways by which antidepressants may cause hydrocephalus remain to be elucidated. Behavioral aspects associated with maternal use of antidepressants (nutritional status, alcohol consumption, and compliance with prenatal screening programs) and the subsequent risk of congenital hydrocephalus should be investigated.