Department of Public Health Sciences

Environmental risk factors for autism spectrum disorders

AKADEMISK AVHANDLING
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ABSTRACT

Aims: Two overarching hypotheses were tested in this thesis- first, that the environmental factors studied during pregnancy or the time preceding birth would be associated with a higher risk of autism spectrum disorders (ASD) in the offspring; and second, that these risk factors and/or their magnitude of associations may be different for autism spectrum disorders with and without intellectual disability (ID).

Methods: Studies I-IV were case-control studies nested within a population-based cohort of all children 0 to 17 years old, living in Stockholm County between the years 2001 to 2007 (n=589,114). ASD cases, identified using multisource case-ascertainment, were matched by age and sex to 10 living non-ASD controls. Prospectively collected information on exposures and potential confounders was ascertained by record linkage with relevant registers, and timed to the prenatal period. Exposures included measures of parental socioeconomic status (Study I), migration (Study II), life events (Study III) and parental depression and maternal antidepressant use during pregnancy (Study IV). For Study III, an additional cohort in England (maximum n = 11554) was used to study the risk of offspring ASD in relation to a combined maternal exposure to up to 42 common and rare life events, as well as their perceived impact upon the mother during pregnancy and early life.

Results: In Study I, measures of a lower parental socioeconomic status – specifically, lower household income, and unskilled, manual or unclassified occupations were associated with a higher risk of ASD. The associations were similar in ASD with or without ID. In Study II, maternal migration had divergent relationships with ASD with and without ID- showing heightened risks for ASD with ID and reduced ones for ASD without ID. This study found that associations of migration with autism varied by the geographical region of origin of the mother, by the human development of the region of origin, and the timing of migration in relation to pregnancy. In Study III, no evidence for a relationship between stressful life events during pregnancy and a heightened risk of ASD was found, using data from the two population-based studies in Sweden and England respectively. In Study IV, a higher risk of ASD was associated with a prenatal history of maternal depression, but did not appear to be associated with paternal depression. In a smaller sample, when maternal antidepressant use was simultaneously studied, the associations of maternal depression with ASD appeared to be confined to the group of women who reported taking antidepressants during pregnancy. The associations were higher for ASD without ID, and were not observed for ASD with ID.

Conclusion: In three of the four studies there was evidence of a relationship between the prenatal factors studied and a higher risk of autism spectrum disorders. In two studies, the timing of the event (migration, antidepressant use or severe depression during pregnancy) was indicative of pregnancy related exposures, highlighting the importance of considering environmental factors acting in utero in the pathways to autism. The marked differences in risks for autism with and without intellectual disability with exposures in two studies highlight the value of studying these categories separately, since they may have different determinants.