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## Stress During Pregnancy and Offspring Pediatric Disease

### A National Cohort Study

Marion Tegethoff; Naomi Greene; Jørn Olsen; Emmanuel Schaffner; Gunther Meinlschmidt

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### Abstract

**Background** Identifying risk factors for adverse health outcomes in children is important. The intrauterine environment plays a pivotal role for health and disease across life.

**Objectives** We conducted a comprehensive study to determine whether common psychosocial stress during pregnancy is a risk factor for a wide spectrum of pediatric diseases in the offspring.

**Methods** The study was conducted using prospective data in a population-based sample of mothers with live singleton births ( $n = 66,203$ ; 71.4% of those eligible) from the Danish National Birth Cohort. We estimated the association between maternal stress during pregnancy (classified based on two *a priori*-defined indicators of common stress forms, life stress and emotional stress) and offspring diseases during childhood (grouped into 16 categories of diagnoses from the *International Classification of Diseases, 10th Revision*, based on data from national registries), controlling for maternal stress after pregnancy.

**Results** Median age at end of follow-up was 6.2 (range, 3.6–8.9) years. Life stress (highest compared with lowest quartile) was associated with an increased risk of conditions originating in the perinatal period [odds ratio (OR) = 1.13; 95% confidence interval (CI): 1.06, 1.21] and congenital malformations (OR=1.17; CI: 1.06, 1.28) and of the first diagnosis of infection [hazard ratio (HR) = 1.28; CI: 1.17, 1.39], mental disorders (age 0–2.5 years: HR = 2.03; CI: 1.32, 3.14), and eye (age 0–4.5 years: HR = 1.27; CI: 1.06, 1.53), ear (HR = 1.36; CI: 1.23, 1.51), respiratory (HR = 1.27; CI: 1.19, 1.35), digestive (HR = 1.23; CI: 1.11, 1.37), skin (HR = 1.24; CI: 1.09, 1.43), musculoskeletal (HR = 1.15; CI: 1.01–1.30), and genitourinary diseases (HR = 1.25; CI: 1.08, 1.45). Emotional stress was associated with an increased risk for the first diagnosis of infection (HR = 1.09; CI: 1.01, 1.18) and a decreased risk for the first diagnosis of endocrine (HR = 0.81; CI: 0.67, 0.99), eye (HR = 0.84; CI: 0.71, 0.99), and circulatory diseases (age 0–3 years: HR = 0.63; CI: 0.42, 0.95).

**Conclusions** Maternal life stress during pregnancy may be a common risk factor for impaired child health. The results suggest new approaches to reduce childhood diseases.