Case control study

People with schizophrenia are more likely to have a mother who smoked during pregnancy than people without the condition

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Implications for practice and research

- Women who smoke during pregnancy expose their offspring to toxins, which may affect their immediate and long-term development.
- Research should continue to explore the potential long-term impact that prenatal tobacco exposure (PTE) may have on developmental outcomes including psychiatric disorders.

Context

Tobacco is one of the most common substances used during pregnancy.[1] Gestational smoking exposure is associated with obstetric abnormalities and low birthweight,[2] which may lead to developmental disorders in childhood,[3] as well as later risk factors for psychiatric disorders. In addition to genetic factors, environmental factors may play a role in the aetiology of psychotic disorders, and PTE has been considered as having a potential influence on developing psychotic disorders.[4] In the current study, Stathopoulou and colleagues examined the association between prenatal smoking behaviours of mothers of schizophrenic and non-schizophrenic patients. The purpose of their study was to determine if there was an association between PTE and the risk of schizophrenia and the severity of schizophrenic symptomatology.

Methods

Between 2002 and 2008, 212 schizophrenic inpatients and outpatients were recruited into the study. Diagnoses were determined from a structured clinical interview. A further 212 individuals were included as controls. Control subjects were matched on sex, age, educational level and place of residence. PTE was assessed retrospectively by asking both parents about smoking during pregnancy. Statistical analyses of the data included testing reliability of the schizophrenia diagnosis, and logistic and multiple linear regression analyses to identify variables that significantly predicted presence or absence of schizophrenia and symptomatology severity, respectively.

Findings

The schizophrenic patients and controls, 43% and 21.7%, respectively, had PTE. In the multivariate analyses, maternal smoking during pregnancy had a significant unique contribution to the risk of offspring schizophrenia. It also significantly predicted an increased severity of negative symptoms. Other significant predictors of offspring schizophrenia included family history of schizophrenia and the use of other illicit drugs in offspring. Covariates that did not predict schizophrenic risk were paternal smoking, obstetric complications, maternal alcohol use during pregnancy and patient alcohol use.

Commentary

This study contributes to the scientific literature in finding a significant long-term association between PTE and schizophrenia. Its large sample size adds strength to the study findings, allowing assessment and control of important covariates. Findings of PTE's independent contribution to the development of schizophrenia have important clinical and prevention implications, as pregnancy presents an opportune time for behavioural modification and access to medical care. The findings of PTE predicting increased severity of symptoms add credence to links made between PTE and schizophrenia.

Several limitations of this study mean the results should be interpreted with caution. Although the authors matched the samples on demographic information, the population from which the control group was ascertained was not specified. Community versus clinically based samples may differ on other variables that could influence findings. Also, while the authors collected patient drinking history, it is not clear why they did not report their smoking history, as it is well known that smoking is highly prevalent among schizophrenic patients.[5] Another author-noted limitation is that PTE was collected retrospectively and based on historical recall of up to 30 years.

These study findings are in contrast to a similarly designed study that found no relation between PTE and schizophrenia.[6] In that sample, control subjects were recruited from another clinical setting, an emergency room. It is possible that their lack of significant relations between PTE and schizophrenia may have been influenced by a smaller sample size, thereby limiting statistical power. Overall, this is an important study with findings that may underscore the potential role of PTE on the development of schizophrenia. More studies that utilise larger sample sizes, with more optimal study designs, that collect gestational smoke exposure data prospectively and follow the offspring to adulthood are warranted.

Competing interests None.

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