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Online supplement

Method

Procedure

Pregnancy and the first postnatal year

Two academic general practitioners (GPs) interviewed the mothers at 36 weeks of pregnancy, and at 3 and 12 months postpartum. At each interview an assessment was made of the women's current mental state over the past 2 weeks using the Clinical Interview Schedule (CIS)[12] to generate ICD-9 diagnoses. The overall agreement of the reported symptoms on the CIS from the tape-recorded interviews, given as a weighted kappa coefficient, was 0.80. Consensus ICD-9 diagnoses were made by the two GPs on the basis of the content of these interviews.

4th, 11th and 16th birthdays

Maternal depression. We visited families at home when the children were approaching 4 years and at 11 and 16 years. At each time point, mothers provided sociodemographic information, current and retrospective to the last visit, to one of two research psychologists who was unaware of the information collected at previous visits. Diagnoses of maternal major depression (probable and definite), minor depression (definite), and intermittent depression, both current and retrospective to the last assessment, were made according to Research Diagnostic Criteria (RDC). We used the lifetime version of the Schedule for Affective Disorders and Schizophrenia (SADS-L).[13] All interviews were tape-recorded. Diagnoses were made on the basis of the content of these interviews by a senior research psychologist and a psychiatrist who had not participated in the interviews.

Antenatal maternal depression (in pregnancy) was rated as being present if an ICD diagnosis was given at the third trimester interview. A diagnosis of postpartum depression was given if the mother had a current ICD diagnosis at 3 months after the birth and a diagnosis was also made at the child's 1st birthday interview. The RDC, current and retrospective, were used in early childhood (1–4 years), middle childhood (4–11 years) and adolescence (11–16 years) to describe additional periods of maternal depression during the offspring's life. Chronic depression was calculated as the number of periods from pregnancy to 16 years during which the mother experienced a depressive episode with a range of 0–5.

Maternal history of childhood abuse. At the 4-year interview mothers were asked whether they had experienced physical and/or sexual abuse before the age of 16 years.

Maternal perceived emotional security within her family of origin. At the 4-year interview mothers were asked what their home was like as a child, before the age of 16 years. Queries were made about her parents' relationship, the home environment, financial difficulties, and how happy or miserable she felt as a child. A rating of emotional security was made on a 4-point Likert scale by the mother and further dichotomised into secure and insecure.

Family stress. This was measured by the number of parental relationship changes experienced during the offspring's lifetime from 0 to 16 years. A change was recorded when either a parental figure left the family home or a new parental figure entered the home.

Mothers' juvenile conduct symptoms. At the visit at 16 years, we obtained mothers' retrospective reports of their own conduct symptoms before the age of 15, using the antisocial personality disorder section of the SADS-L.[13] All women were asked about juvenile conduct symptoms, whether or not they screened in as possible cases of antisocial personality disorder. A 10-item scale was constructed, summing women's reports of truancy, expulsion from school, rule-breaking, stealing, lying, running away, vandalism, underage alcohol use, underage sex and juvenile arrest (Cronbach's $\alpha = 0.75$).

Biological fathers' history of arrest. Mothers reported on the biological fathers' history of arrest at the interviews at 11 and/or 16 years. In five cases where the mother did not have custody of the child, the father was interviewed, and reported on his own history of arrest.

Children's experience of psychopathology. In tape-recorded interviews at 11 and 16 years, parents (in most cases, the biological mother) and children were independently asked, each by a different researcher, about any psychological problems, using the Child and Adolescent Psychiatric Assessment (CAPA).[14] The CAPA is a psychiatric interview for children, which elicits information about events and symptoms contributing to a wide range of DSM-IV diagnoses. A 3-month 'primary period' is used rather than a longer period, because shorter periods are associated with more accurate recall. At 11 and 16 years, DSM-IV diagnoses and symptom scales were generated by computer algorithms based on 'combined reports' where a symptom is regarded as being present if either parent or child reports it. Diagnoses were made with reference to the functional impairment or incapacities section of the CAPA and show acceptable levels of test–retest reliability.

Children's experience of maltreatment. In the same tape-recorded CAPA interviews at 11 years, parents and children were independently asked about the child's experiences of trauma in the form of severe maltreatment both within and outside of the family. Assessments apply clear and consistent definitions and thresholds for the presence of symptoms, which are determined by the interviewer through standardised but flexible questioning. A dichotomous measure of childhood maltreatment was made from the combined reports (parent and child) of the children's experiences of harsh parental discipline during the previous 3-month CAPA 'primary period', along with information about any *lifetime* experiences of physical or sexual abuse. Harsh parental discipline was rated if one or both parents used a harsh, restrictive or excessively physical disciplinary style, leading to punishments that were more severe than would usually be thought appropriate. Physical abuse was rated if the child had been the victim of intentional physical abuse or injury by a family member sufficiently severe to leave marks, bruises or cuts, or require medical treatment. A sexual abuse episode was rated when a person (perpetrator) had involved the child in activities for the purpose of the perpetrator's own sexual gratification. Children were rated as having been maltreated if they had experienced one or more of these three forms of abuse. It is the first time that such data are described for this cohort.

Offspring depressive disorders. We report DSM-IV diagnoses of major depressive disorder, dysthymic disorder and depression not otherwise specified based on combined reports at 11 and 16 years.

Offspring conduct disorder. DSM-IV diagnoses of conduct disorder based on combined reports at 11 and 16 years are reported.

Results

Other possible confounders

We analysed four potential confounders: maternal report of her own childhood experience of physical and sexual abuse; maternal report of her own childhood as insecure; child exposure to parental relationship changes from 0 to 16 years (as a proxy for the quality of the parental relationship throughout the child's lifetime); and chronic depression in mothers. Maternal report of her own childhood experience of physical and sexual abuse was significantly associated with more offspring psychopathology ($n = 107$, χ^2 (1) = 4.6, $P = 0.03$; OR = 2.6, 95% CI 1.1–6.2) and was also a significant predictor of the mother's depression in pregnancy ($n = 107$, χ^2 (1) = 12.8, $P < 0.001$; OR = 6.1, 95% CI 2.1–17.8), but not of offspring maltreatment. However, it no longer made a significant independent contribution in the logistic regression model, where the interaction of exposure to antenatal depression and to childhood maltreatment significantly predicted offspring psychopathology (Wald statistic = 4.59, d.f. = 1, $P = 0.03$; OR = 7.00, 95% CI 1.2–41.5). Maternal report of her own childhood as insecure was also associated with higher levels of offspring psychopathology ($n = 107$, χ^2 (1) = 9.7, $P = 0.002$; OR = 4.7, 95% CI 1.7–13.0) and also predicted maternal depression in pregnancy ($n = 107$, χ^2 (1) = 11.2, $P = 0.001$; OR = 5.6, 95% CI 1.9–16.7). It was not significantly associated with offspring maltreatment. It continued to be an independent predictor of offspring psychopathology when considered within the logistic regression model (Wald statistic = 6.11, d.f. = 1, $P = 0.01$; OR = 3.87, 95% CI 1.3–11.3) where the interaction between exposure to antenatal depression and childhood maltreatment in predicting childhood psychopathology also remained significant (Wald statistic = 5.16, d.f. = 1, $P = 0.02$; OR = 7.47, 95% CI 1.3–42.3). Similarly, child exposure to parental relationship changes from 0 to 16 years (range 0–10, with 56% of the children having one or more change) was positively associated with childhood psychopathology (Mann–Whitney *U*-test, $z = 3.31$, $P = 0.001$), but not with antenatal depression or offspring maltreatment. When considered within the logistic regression model, the number of parental relationship changes continued to have a significant independent effect (Wald statistic = 5.99, d.f. = 1, $P = 0.01$; OR = 1.23, 95% CI 1.0–1.4), as did the interaction between exposure to antenatal depression and childhood maltreatment in predicting childhood psychopathology (Wald statistic = 6.31, d.f. = 1, $P = 0.01$; OR = 8.32, 95% CI 1.6–43.4). Finally, almost all (92%) of mothers who had depression in pregnancy had at least one further episode in the child's lifetime. Chronic depression was significantly associated with more offspring psychopathology ($n = 115$, Mann–Whitney *U*-test, $z = 3.22$, $P = 0.001$), but not with offspring maltreatment. It continued to be an independent predictor of offspring psychopathology when considered within the logistic regression model (Wald statistic = 5.48, d.f. = 1, $P = 0.02$; OR = 1.42, 95% CI 1.1–1.9) as did the interaction between exposure to antenatal depression and childhood maltreatment in predicting childhood psychopathology (Wald statistic = 5.05, d.f. = 1, $P = 0.02$; OR = 6.82, 95% CI 1.3–36.3).