Research report

Trajectories of maternal depression and offspring psychopathology at 6 years: 2004 Pelotas cohort study

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ABSTRACT

Background: Few studies have addressed the course and severity of maternal depression and its effects on child psychiatric disorders from a longitudinal perspective. This study aimed to identify longitudinal patterns of maternal depression and to evaluate whether distinct depression trajectories predict particular psychiatric disorders in offspring.
Methods: Cohort of 4231 births followed-up in the city of Pelotas, Brazil. Maternal depressive symptoms were assessed with the Edinburgh Postnatal Depression Scale (EPDS) at 3, 12, 24 and 48 months and 6 years after delivery. Psychiatric disorders in 6-year-old children were evaluated through the development and well-being assessment (DAWBA) instrument. Trajectories of maternal depression were calculated using a group-based modelling approach.
Results: We identified five trajectories of maternal depressive symptoms: a "low" trajectory (34.8%), a "moderate low" (40.9%), a "increasing" (9.0%), a "decreasing" (9.9%), and a "high-chronic" trajectory (5.4%). The probability of children having any psychiatric disorder, as well as both internalizing and externalizing problems, increased as we moved from the "low" to the "high-chronic" trajectory. These differences were not explained by maternal and child characteristics examined in multivariate analyses.
Limitations: Data on maternal depression at 3-months was available on only a sub-sample. In addition, we had to rely on maternal report of child's behavior alone.
Conclusions: The study revealed an additive effect on child outcome of maternal depression over time. We identified a group of mothers with chronic and severe symptoms of depression throughout the first six years of the child life and for this group child psychiatric outcome was particularly compromised.

1. Introduction

Non-psychotic depression is a common health problem among women during the childbearing years, with a typical prevalence of around 14% (O'Hara and Swain, 1996), though in some contexts the prevalence appears to be considerably higher (Cooper et al., 1999). The majority of cases of postnatal depressions are self-limiting, resolving within three to six months of onset (Cooper and Murray, 1998). However, there is evidence suggesting that for many women the first episode could trigger recurrent or chronic episodes of depressive disorder (Kumar and Robson, 1984; Watson et al., 1984).

Psychopathology in parents is a strong predictor of mental disorders in children (McLaughlin et al., 2012). Approximately 40% of children of depressed parents have one or more mental disorders (not just depression), and children with parents with antisocial personality disorder also are at increased risk for a variety of disorders (Angold and Costello, 1995). Different theoretical models about genetic and environmental effects have been proposed to explain the transmission of mental disorders between generations. Although it is likely that genetic effects account for a substantial proportion of the variance, exposure to parents who have psychopathology appears to be a significant independent risk factor.

Maternal depression after childbirth is associated with serious adverse effects on family functioning, impairing the marital relationship and increasing partner conflict (Burke, 2003). It also has an

adverse effect on the mother-infant relationship and can compromise infant care (Murray et al., 1996). Offspring of depressed mothers are more likely than children of non-depressed mothers to have cognitive delay and emotional difficulties as well as internalizing and externalizing problems, with evidence that these problems persist throughout childhood and adolescence (Lovejoy et al., 2000; Maughan et al., 2007; Murray et al., 2011, 2001; Sharp et al., 1995; Sinclair and Murray, 1998).

Maternal depression commonly occurs in the context of social and family risk factors, such as low socioeconomic status, unemployment, lack of parental support, and other family stressors (Pickett and Wilkinson, 2010). The combination, sequence and interrelationship of these factors may contribute directly or indirectly to the development of mental disorders in childhood, over and above the influence of maternal depression (Barker et al., 2012; Goodman and Gotlib, 1999).

Although the consequences of chronic or recurrent maternal depression on offspring mental health are well known (Brennan et al., 2000), most studies of the impact of postnatal depression on child outcomes have addressed incompletely the course and severity of maternal depression. We identified few studies, and all of them from high-income countries, that modeled trajectories of maternal depression and studied the impact of these trajectories on child psychiatric disorders (Ashman et al., 2008; Campbell et al., 2007; Cents et al., 2013; Gross et al., 2009). Only two of these studies used a group-based modelling approach to empirically derive trajectories of maternal depression. The present study, conducted in a middle-income country, had three main objectives: (1) to identify longitudinal patterns of maternal depression between three months and 6 years postpartum using a group-based modelling approach; (2) to examine predictor variables for maternal depression trajectories; and finally (3) to evaluate whether distinct maternal depression trajectories predict particular psychiatric disorders in children at age 6 years.

2. Methods

2.1. Participants

Pelotas is located in the South of Brazil and has a population of about 340,000 inhabitants. More than 99% of all deliveries take place in hospitals. In 2004, a birth cohort study attempted to enroll all births to mothers resident in the urban area. Births were identified through daily visits to the five maternity hospitals. Mothers were interviewed soon after delivery using a structured questionnaire and their newborns were examined by trained fieldworkers under the supervision of a pediatrician. Information was obtained on demographic, socioeconomic, behavioral and biological characteristics, reproductive history, and health care utilization. The non-response rate at recruitment was below 1%. A detailed description of the methodology is given elsewhere (Santos et al., 2011). All live births ($n=4231$) were enrolled in the cohort study. Follow-up assessments were made at home at mean (SD) ages 3.0 (0.1), 11.9 (0.2), 23.9 (0.4) and 49.5 (1.7) months and at a research clinic at 6.8 (0.3) years, with follow-up rates between 90 and 96%.

2.2. Measures

2.2.1. Maternal depressive symptoms

Repeated assessments of maternal depressive symptoms were made using the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987). The EPDS was originally devised for the identification of postpartum depression disorders in clinical and research settings. The EPDS is a self-administered, 10-item scale; each item has four possible responses from 0 to 3, with a total minimum score of 0 and a maximum of 30. The scale indicates the intensity of depressive symptoms over the preceding seven days. We used a Brazilian version of the questionnaire, validated in a previous study (Santos et al., 2007). The validation study showed that a cut-off score of ≥ 10 identified women at risk of minor depression in our population with 82.6% (75.3–89.9%) sensitivity and 65.4% (59.8–71.1%) specificity, and EPDS ≥ 11 identified those at risk of moderate or severe depression with 83.8% (73.4–91.3%) sensitivity and 74.7% (69.4–79.5%) specificity. Mothers' scores on the EPDS correlated moderately over time (from 0.42 to 0.63). The EPDS was administered to almost all of the birth cohort mothers at each follow-up, with the exception of the three-month follow-up, where the EPDS was administered to a sub-sample of 965 mothers (all mothers whose infants were born between October 1 to December 31, 2004).

2.2.2. Child's psychiatric disorders

At the six-year follow-up children were assessed using the development and well-being assessment (DAWBA; Goodman et al., 2000), validated in the Brazilian population by Fleitlich-Bilyk and Goodman (2004). The DAWBA consists of a structured interview, as well as open-ended questions, about the presence of psychiatric symptoms. It also assesses the impact of symptoms on the child's life. The DAWBA is designed to generate psychiatric diagnoses according to ICD-10 (World Health Organization, 1993) and DSM-IV (American Psychiatric Association, 1994) criteria for ages 5–17 years. The DAWBA was administered by trained psychologists to mothers or caregivers. The Strengths and Difficulties Questionnaire (SDQ) was also administered at the beginning of the interview, as a psychiatric screen. Thus, SDQ scores obtained on the subscales of emotional problems, conduct problems, and hyperactivity were used to determine which sections of the DAWBA would be administered (Goodman, 2001). In our study the DAWBA included the sections for separation anxiety disorder, specific phobia, social phobia, generalized anxiety disorder, posttraumatic stress disorder, panic disorder and agoraphobia, obsessive-compulsive disorder, attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder, conduct disorder, eating disorders, and tic disorders. We analyzed three broad types of child psychiatric outcomes: (1) any disorder; (2) externalizing disorders, including oppositional defiant disorder, conduct disorder and any attention deficit-hyperactivity disorder (ADHD) which comprises hyperactive, inattentive and combined sub-types and ADHD not otherwise specified; and (3) internalizing disorders, including diagnoses of anxiety and depression. Two experienced child psychiatrists reviewed all the data available for each child (including free text comments made by respondents) and decided whether to accept or overturn computer-generated diagnoses. 36% of those assessed as having any DSM-IV disorder by the computer algorithm were not given any clinician-rated diagnosis. Conversely, only 6% of those assessed as not having any disorder by the computer algorithms did receive at least one clinician-rated diagnosis.

2.2.3. Covariates

Information on maternal and child variables was collected in the perinatal interview. Maternal schooling at the time of delivery was recorded as complete school years of formal education. Maternal age was recorded in complete years. Women who were single, widowed, divorced, or lived without a partner were classified as single mothers. Mothers' skin color was self-reported and categorized as White or Black/mixed. Parity was defined as the number of previous viable pregnancies and categorized as < 2 and ≥ 2. Maternal depression during pregnancy was defined as "present" if the mother answered positively to the following question: "*During pregnancy, did you feel depressed or have any nervous condition*?" Women were asked when their prenatal care began (first trimester or later) and if they planned their pregnancy (yes/no). Maternal smoking behavior during pregnancy was assessed retrospectively at birth by self-report. Regular