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Research paper

Trajectories of maternal depressive symptoms in the early childhood period and family-wide clustering of risk

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ABSTRACT

Background: Previous research on individual differences in the course of maternal depressive symptoms has yielded inconsistent findings, with significant variation in the number and pattern of trajectories identified. In addition, missing from the literature is a comprehensive examination of predictors and longitudinal consequences of particular depression trajectories.

Method: Participants in this study included a community cohort of 501 women assessed for depression using the Center for Epidemiologic Depression Scale at infant age 2, 18, 36, and 54 months. A multi-informant approach was used to examine predictors and outcomes of trajectory membership.

Results: Using growth mixture modeling, three distinct trajectories emerged: 84% of the sample demonstrated low-stable levels of depressive symptoms, 9.5% had high-decreasing scores, and 6.5% had moderate-increasing scores. While socioeconomic status and marital conflict differentiated the low-stable group from the high-decreasing and moderate-increasing group, neighborhood collective efficacy differentiated the latter two groups. At 54 months, a clustering of family risks was prevalent for the moderate-increasing depression group, including higher marital conflict and household chaos, lower parental positivity, and heightened levels of child psychopathology.

Limitations: Limitations include reliance on self-reports to assess maternal depression and the relatively small sample size of certain trajectory classes.

Conclusions: The onset and course of maternal depression in the early childrearing period is heterogeneous, with distinct subgroups in the population. Comprehensive assessment of individual, family, and neighborhood stressors augments our understanding of the predictors and consequences of trajectory membership over this critical period of child and family adaptation.

1. Introduction

Depression is one of the most common psychiatric illnesses, and is considered to be the leading cause of disease-related disability worldwide among women (Kessler et al., 2003). Maternal depressive symptoms are common in the early childrearing period, with meta-analytic estimates suggesting that 19.2% of women experience a depressive episode within 3 months of childbirth (Gavin et al., 2005). Exposure to maternal depression during the first few years of life may be particularly problematic for children, as they are undergoing a period of rapid brain and biobehavioral organization (Shonkoff et al., 2012; Teicher et al., 2003). Indeed, increased severity and chronicity of maternal depression has been shown to be an especially potent predictor of deleterious child outcomes (Ashman et al., 2008; Campbell et al., 2007).

A growing body of research suggests that the course and severity of maternal depression is heterogeneous. In a comprehensive review of the literature, Vliegen et al. (2014) determined that the number of subgroups of maternal depression likely depends on how depression was defined. When depression was measured diagnostically, a group of chronically depressed and remitting mothers most commonly characterized the literature. However, when the severity of depression was taken into account, a third group of mothers with stable-minor depression was identified. These results suggest that there are both

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qualitative (i.e., course) and quantitative (i.e., severity) differences to consider when examining trajectories of maternal depression.

At present, there is considerable variability in the number and pattern of maternal depression trajectories identified over the early childhood period (Ashman et al., 2008; Campbell et al., 2007; Cents et al., 2013; van der Waerden et al., 2015). These inconsistent findings create difficulty in planning prevention and intervention efforts and targeting sub-groups at greatest risk of psychosocial maladaptation. Although cross-study differences may be attributed to sampling and measurement factors, one critical difference among existing trajectory studies is the methodology used to derive the trajectories. Two methods are often used. The first is latent class growth analysis (LCGA), which assumes that individual differences in symptom course are entirely accounted for by qualitative differences – that is, they are accounted for by distinct trajectories and there is no variability in severity among individuals within each trajectory. Because this method assumes that individual differences are entirely accounted for by qualitative differences, it has a tendency to extract a relatively larger number of trajectories. To date, studies using LCGA have generally identified 4–6 depression trajectories (e.g., Campbell et al., 2007; Cents et al., 2013; van der Waerden et al., 2015). The second method is growth mixture modeling (GMM), which assumes that individual differences in symptom course are accounted for by both distinct trajectories (i.e., qualitative differences between classes) as well as variability among individuals within each trajectory (i.e., quantitative differences in severity within each class). GMM is particularly appropriate for describing the course of depressive symptoms as it accounts for both symptom course and severity (Vliegen et al., 2014). Despite its advantages, only one study to date has used GMM to describe maternal depression across early childhood (Ashman et al., 2008). This study identified three trajectories: 30% of the sample experienced decreasing symptoms, 8% chronic symptoms, and 62% stable-mild symptoms. However, the sample size for this study was small, and non-depressed participants were not included in the analyses. As a result, it is unclear if the number and pattern of trajectories is generalizable to community samples. Moreover, studies examining risk and protective factors of trajectory membership have commonly examined whether membership in the elevated trajectory groups is associated with greater risk for child psychopathology. In the current study, we extend this literature by comprehensively examining individual and family-wide downstream consequences of trajectory membership, including marital conflict, caregiving behavior, family chaos, and child psychopathology.

2. Putative psychosocial stressors associated with depression trajectories

Etiological models of depression often focus on eventful changes that occurs as a function of stress or life events (Yim et al., 2015). It has been suggested that changes associated with the birth of a child explicitly pull for individual and family re-adjustment, which can intensify psychological stress and create vulnerability for depression or exacerbate pre-existing difficulties (O'Hara et al., 1982; Pearlin et al., 1981). Several antecedent psychosocial stressors have been shown to predict elevated levels of maternal depression (Boyce and Hickey, 2005). Lower maternal age and educational attainment, single parenthood, and poverty have been associated with persistent depressive symptoms in mothers, suggesting that socioeconomic disadvantage exacerbates the risk of depression (O'Hara and Swain, 1996; Pascoe et al., 2006). Moreover, the accumulation of traumatic childhood events has been shown to have life-long consequences for adaptation and psychological functioning (Felitti et al., 1998). Another putative psychological stressor for depression is marital conflict, wherein heightened discord often coincides with elevated levels of depressive symptoms (Cox et al., 1999; Yim et al., 2015). Separate lines of evidence have pointed to pre/perinatal problems as a source of increased depression (O'Hara and Swain, 1996). Specifically, mothers of low birth weight children are at an increased risk of depression, possibly due to enhanced stress associated with suboptimal pregnancy and the demands of caring for a medically vulnerable child (Field et al., 1985; Vigod et al., 2010). Finally, the absence of psychological resources or social support networks may impinge on one's capacity to effectively manage stress in several domains (Cohen and Wills, 1985; Pearlin et al., 1981), and this may include neighborhood-wide factors (Sampson, 1997). In sum, several theoretically and empirically derived individual and family stressors may serve as antecedent risks for maternal depression. To date, however, no study has examined such a wide range of risks as predictors of maternal depression trajectories in the early postnatal period.

3. The current study

The current study examined trajectories of maternal depressive symptoms in a large, community-based sample of mothers assessed at four times over the first five years following the birth of their child. The goals were to: (1) identify heterogeneous trajectories of depressive symptoms, wherein we hypothesized the number and nature of the trajectories would coincide with previous research reflecting chronic, remitting, and low-stable groups (Ashman et al., 2008; Vliegen et al., 2014); (2) examine various psychosocial and ecological factors at infant age 2 months that putatively differentiate among trajectory groups. Here, it was hypothesized that belonging to a trajectory group characterized by higher initial levels and/or higher chronicity would be associated with more psychosocial problems; and (3) validate the existence of trajectory groups by examining family-wide consequences of group membership at child age 5. It was expected that trajectories characterized by relatively higher levels of depressive symptoms over the study period would demonstrate more clustering of family dysfunction compared to those with consistently low or less chronic levels of depression.

4. Method

4.1. Participants

Multiparous women giving birth to infants in the cities of Toronto and Hamilton between 2006 and 2008, who had been contacted by the *Healthy Babies Healthy Children (HBHC)* public health program (run by Public Health Units), were considered for participation. Inclusion criteria were: (1) English-speaking mother; (2) a newborn weighing ≥1500 g; (3) one or more children less than 4 years old in the home; and (4) agreement to the collection of observational and biological data. Thirty-four percent of mothers whose information was passed by HBHC consented to participate. Reasons for non-enlistment included inability to contact families, ineligibility once contacted, and refusals. The research questions were examined using the enlisted sample of 501 mothers and their target newborns. Families were followed at 2 (Time 1; T1, *N*=501), 18 (Time 2; T2, *N*=397, 79% of original sample), 36 (Time 3; T3, *N*=385, 77% of original sample), and 54 months (Time 4; T4, *N*=323, 65% of original sample). Attrition analysis showed that dropout was related to lower maternal education, family income, and teenage pregnancy. As detailed elsewhere (Meunier et al., 2013), families in our sample were similar to 2006 Census data on family size, income, immigration status, and marital status. However, education levels of mothers (53.3% vs. 30.6% earned a bachelor degree or higher), and the proportion of Canadian-born versus immigrants to Canada were higher in our sample (57.7% vs. 47.6%) compared to the general population.

4.2. Procedure

At each of the four time points, families participated in a 2-h home interview conducted by trained interviewers and completed several