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Association between life stress during pregnancy and infant crying in the first six months postpartum: A prospective longitudinal study

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KEYWORDS

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Life stress;
Negative life events;
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Behavior regulation;
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Abstract

Objective: To examine prospectively the relationship between prenatal life stress and infant crying/fussing during the first 6 months of postnatal life, taking into account an array of confounders suggested in the literature.

Design: Prospective longitudinal study of a convenient sample, with data points in pregnancy and at about 6 weeks, 3, and 6 months postpartum.

Methods: The study included 86 pregnant women who completed a standardized, validated and widely used questionnaire on negative life changes experienced in the preceding 12 months. Women were grouped by median split on the impact score of negative life changes. Demographic, obstetric and lifestyle variables were obtained from pre- and postnatal interviews and from medical records in order to be taken into account as possible confounders. At all three postnatal data points, mothers kept a validated 5-day 24-h behavior diary to assess durations of infant crying/fussing.

Results: Infants of mothers with high scores of negative life changes exhibited more crying/fussing than infants born to mothers with low negative change scores, throughout the first half year postpartum, but particularly at ages 3 and 6 months. These results do not seem to be spurious due to the confounders considered in this report or to recording bias.

Conclusion: Prenatal life stress is associated with infant crying/fussing in the first half year after delivery. To prevent or reduce infant crying and to foster a well-adapted parent–infant relationship, professionals attending expectant mothers should consider their emotional condition. If required, support should be provided already in pregnancy.

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1. Introduction

During the first months of postnatal life, most infants are prone to increased crying and/or fussing, particularly in the late afternoon and evening hours [1]. The increase in crying/fussing amounts exhibits a typical age dependent pattern, first described by Brazelton [2] and replicated by many others (e.g., [1,3–6]): crying/fussing begins to augment in the first two weeks postpartum, peaks at about 6 weeks, on average, and subsides by the age of about 3 months. The crying/fussing peak has been explained by normal maturational and neuro-developmental processes during the early postnatal period [3,6–9].

Evidence in favor of this view is converging [10–12]. However, onset, peak and ending, as well as the amounts of crying/fussing at specific ages, display a high interindividual variability. For instance, crying/fussing in individual infants has been reported to peak between 3 and 12 weeks of age [6]. Similarly, daily crying/fussing durations at ages 6, 13, 26, and 52 weeks have been found to vary extremely from a minimum of 0 to 280, 210, 145, and 115 min, respectively [13]. At the age of 0 to 3 months, extreme expressions of crying/fussing, as defined according to the now commonly used criteria of Wessel et al. [14] (crying/fussing of more than 180 min/day, on more than three days in any one week), are estimated to range from 5% to 29% of infants in Western European countries [15]. The same diurnal rhythm and age dependent pattern in crying/fussing have been reported for these excessively crying infants [16]. But again, excessive crying continues beyond the age of three months in some 40% of all cases [17,18]. This large variability in crying/fussing cannot be solely accounted for by maturational processes.

On the part of the infant, difficult temperament [19,20], pediatric conditions [21], birth weight and other physical factors related to birth [22,23] have been assumed as putative sources for variations in crying/fussing amounts. On the part of the parents, effects of maternal sensitivity [24,25], care giving techniques [3,26], feeding practices [22,27], and demographic and lifestyle variables [22,28] on infant crying/fussing amounts have been investigated. Often, results have been inconsistent or difficult to interpret. Recently, some researchers have focused on psychosocial factors during pregnancy. Interest in this research originates from retrospective reports of increased psychosocial stress in pregnancy for mothers with excessively crying infants, as compared to control mothers with moderately or low crying infants [29,30]. To our knowledge, only 4 longitudinal studies have investigated the association between psychosocial stress, experienced by the mother in pregnancy, and amounts of infant crying, so far. In a large scale prospective study of a randomized sample, Rautava et al. [31] found that symptoms of prenatal stress, marital dissatisfaction, social isolation, and the number of physical symptoms, all assessed before the third trimester, were linked to the prevalence of excessive infant crying by the age of 3 months. Høgdall et al. [23] identified distress from pregnancy, psychosomatic complaints (hyperemesis, pelvic pains), and other psychological problems in pregnancy as significant risk factors for the development of excessive infant crying within the first six months. All of these factors were determined retrospectively shortly after delivery, however. In the study by Søndergaard et al. [22], a more than threefold increased risk of excessive

crying, cumulatively assessed up to the age of 8 weeks, was observed in infants born to mothers with high amounts of general distress in pregnancy. In contrast to these reports, Miller, Barr, and Eaton [32] did not find any associations between both emotional distress and anxiety, ascertained at 34 weeks of gestation, and measures of infant crying/fussing at the age of 6 weeks.

All of these 4 studies have used a longitudinal design with data on maternal distress obtained either in pregnancy or before the peak age of infant crying. This ensures that maternal reports of distress are not biased by the cry problem. However, these studies are limited by a number of methodological shortcomings. First, measures of distress during pregnancy have been ascertained using non-validated questionnaires or telephone interviews in 3 of these studies [22,23,31]. A second flaw, also related to validity, is that 2 of the studies used subjective estimates of the amounts of infant crying as indicators of the target constructs [23,31]. Both limitations raise the question of what really has been measured in pregnancy and in the postpartum period; furthermore, relying on subjective estimates of infant behavior impedes comparison with studies which use validated behavior diaries and the criteria of Wessel et al. [14] to define cases. Third, although the study of Høgdall et al. [23] has a longitudinal design, measures of distress and psychosomatic complaints were obtained retrospectively, after delivery, which might have had an impact on ratings. Fourth, though Miller, Barr, and Eaton [32] used validated and common instruments to assess distress in pregnancy and infant crying/fussing durations, the study started in late pregnancy; the results of several studies imply, however, that stress in the first half of gestation has a more pronounced impact on infant behavior, as susceptibility to the effects of stress decreases in the course of pregnancy [33,34]; thus, Miller et al. [32] may have started data collection too late to detect associations between emotional distress in pregnancy and infant crying/fussing.

Apart from these methodological constraints, none of the previous studies has examined the issue of whether prenatal stress is related to the persistence of infant crying/fussing in the course of the first six months of postnatal life. Therefore, we investigated prospectively the association between stress and infant crying/fussing at ages 6 weeks, 3, and 6 months, parallel to the age dependent crying curve. We utilized validated and common instruments to assess measures of prenatal stress and infant crying/fussing. Impact of life stress, reported by the mother during early–mid gestation, was assessed because it is more specific and quantifiable than general emotional distress. We hypothesized that infants of mothers stressed during early–mid gestation exhibited continuously higher amounts of crying/fussing throughout the first half year postpartum. If confirmed, this information could be useful to develop effective interventions to prevent excessive infant crying/fussing.

2. Methods

2.1. Study design and overview

This is the first report of a larger longitudinal research project on the influences of prenatal stress of the mother on

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