Research report

Predictors for exacerbation/improvement of postpartum depression—A focus on anxiety, the mothers' experiences of being cared for by their parents in childhood and borderline personality: A perspective study in Japan

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ABSTRACT

Objective: To investigate the course and influencing factors of postpartum depression in women during the child rearing period.
Methods: Data were collected during 0-year-old baby check-ups and a follow-up investigation. 262 participants were included in the analysis. Both surveys employed the Zung Self-Rating Depression Scale (ZSDS). The first also comprised the State Trait Anxiety Inventory, Parental Bonding Instrument (PBI), and Borderline Scale Index, enabling sub-division of participating subjects into healthy/pathological groups. ZSDS group and survey scores were compared using the t-test.
Results: The average ages of the children and the ZSDS scores in both surveys were 7.0 ± 3.2 and 21.8 ± 2.4 months, 40.6 ± 7.9 and 40.1 ± 8.7, respectively, with no significant differences among depression scores. When subjects were divided according to individual scale scores, and survey scores compared, depression significantly improved in the high trait/state anxiety group, high PBI maternal care score group, nonborderline personality (BP) trait group, and breast feeding group, whereas depression was significantly exacerbated in the low PBI maternal care score group.
Discussion: Postpartum depression characterized by strong anxiety and a depressive state in mothers with favorable psychological backgrounds showed gradual improvement. We noted an exacerbation of depression during the separation period in mothers who had received poor maternal care. We assume that the feeling of abandonment induced by individuation of their children is a major factor.
Limitations: There is concern that some depressive women may have dropped out due to a performance bias.
Conclusions: Sharing our findings about exacerbation/improvement of depression among medical staff may be beneficial for postpartum mothers.

1. Introduction

Postpartum depression often develops between 4 weeks to 9 months after childbirth and is the most well-known type of depression in new mothers, at a rate of 13–20% (O'hara and Swain, 1996; Yamashita and Yoshida, 2003). It is a very common but important pathological condition that has been well documented.

While most studies only comprised a survey period of up to 6 weeks after childbirth, a few surveyed for a longer period, some as long as 12 months (McMahon et al., 2005). Most studies longer than 12 months investigated the effect of postpartum depression on other outcomes, particularly, child behavior (Darcy et al., 2011; Bekkhus et al., 2011; Murray et al., 1999). Therefore, evaluation longer than 12 months on postpartum maternal depression is still needed.

Depression most frequently occurs during the first trimester, with a gradual decline in the incidence (or improved depression) thereafter (Gaynes et al., 2005). On the other hand, prolonged maternal anxiety/depression which continues from pregnancy to

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18 months postpartum has been reported (Bekkhus et al., 2011). In general, maternal depression spontaneously improves clinically, although it may exacerbate during the weaning period after the child reaches 1 year of age, or during the separation/individuation phase (Mahler and Furer, 1963).

Risk factors of postpartum depression include both biological factors, such as sudden changes in hormone balance, and environmental factors. Many psychological and psychiatric factors, such as neuroticism (Verkerk et al., 2005), prepartum anxiety, low self-esteem (Beck, 2001), and negative life events (Webster-Stratton and Hammond, 1988) have also been reported. Examination of protractive depression persisting for 12 months revealed two particular factors: poor maternal care during childhood and attachment characterized by anxiety of personal relationships (McMahon et al., 2005). No empirical study has examined depression persisting for more than 1 year after childbirth, although Masterson (Masterson, 1976) suggested that mothers with the borderline personality (BP) trait feel abandonment depression (resulting in withdrawal of affection) when their children begin the individuation process. Since poor maternal care during their own childhood appears to be strongly associated with the BP trait (Russ et al., 2003), we speculated that poor maternal care during childhood and the BP trait, which have been associated with each other, are important factors of depression occurring more than one year after childbirth.

2. Objective

We analyzed postpartum depression-related factors in detail in our previous report (Choi et al., 2010). In this study, we investigated the long-term course of depression in women in the child rearing period, particularly in the separation-individuation phase of their children, and followed them to elucidate how various related factors influence the course of postpartum depression. We focused on the most common risk factors, anxiety and neuroticism, and poor maternal care during childhood and the BP trait, which are assumed to be more important at the later period.

3. Methods

We distributed a self-administered questionnaire with explanation to women in the child rearing period with 0-year-old infants at their infant health checkups in four different cities in Japan in 2007. The condition of the children, whether with or without symptoms, was not considered during the distribution period. The questionnaire was distributed to 1200 women. Of them, 413 completed the survey with no missing answers and replied by mail (previous report). The follow-up questionnaire was sent by mail to these 413 subjects in the month when their children became 18 months old within 2007–2009. The questionnaire did not reach 41 subjects due to a change of address. Replies from 269 subjects were sent back by mail. After excluding seven subjects whose replies contained missing answers, 262 were included in the analysis. The survey response rate to the follow-up questionnaires was 65.1% (which was 22.4% of the initial distribution). The replies from a large city, medium-size local city, and two small cities accounted for 18.3%, 51.9%, and 29.8% of the respondents, respectively; there was no significant difference in the survey response rate among the cities. The first questionnaire included: (1) the original questionnaire, (2) Zung Self-Rating Depression Scale (ZSDS), (3) State Trait Anxiety Inventory (STAI-Y), (4) Parental Bonding Instrument (PBI), and (5) Borderline Scale Index (BSI). The follow-up survey was comprised of parts (1) and (2). The original questionnaire checked the subjects' attributions, such as age of mother and child, gender and birth order of child

(first child/second or later), the feeding method (breast milk/ formula milk or both) and economic situation (not financially distressed/financially distressed). We used ZSDS (Zung, 1965; Fukuda and Kobayashi, 1983) to measure depression because it has been utilized in previous studies, involves questions on affect, cognition, behavior and physical symptoms, and is a simple test for overall depression. We used STAI-Y (Spielberger et al., 1970; Hidano et al., 2000) to evaluate trait and state anxiety as it is simple and frequently used in such studies. Since neuroticism is assumed to be an important influential factor of depression in this study, trait anxiety, which is regarded as being similar to neuroticism, was considered more important than state anxiety. PBI (Parker et al., 1979) was used as it involves Father and Mother Forms, each of which is divided into 12 'care' items (0–36 points,) and 13 'overprotection' items (0–39 points, more is pathological). This scale measured the fundamental parental styles and the influence of experience of being cared for during the childhood of the subject retrospectively. The Borderline Scale Index (Conte et al., 1980; Machizawa, 1989) is used in many studies, and was used in this study because the BP trait can be evaluated by simple and easy self-rating.

The results of ZSDS evaluations were analyzed using the paired t-test. The subjects were divided into groups based on the scores of STAI-Y and PBI sub-items and BSI, and the ZSDS score was compared between the groups using the t-test. For STAI-Y, the cut-off score specified in the Japanese edition of the judgment criteria (Hidano et al., 2000) was adopted. For the other scales, we established our own cut-off scores referring to the +1 SD values because there are no established judgment criteria. The cut-off scores were as follows: STAI-Y: trait anxiety, 49/50; and state anxiety, 49/50; PBI: paternal care, 17/16 (less is pathological); paternal overprotection, 15/16; maternal care, 22/21 (less is pathological); and maternal overprotection, 16/17; and BSI: 7/8. Changes in the ZSDS score from postpartum over the separation period were then analyzed in each group using the paired t-test. Other attributions, such as feeding method, age, and primiparity/ parity, were also compared. Whether the assumption of homogeneity was to be applied was decided using the Levene test. The Welch test was adopted if the assumption was not to be applied. This study was performed after approval by the Ethical Review Committee of Kyoto Prefectural University of Medicine (application no. C-183). Analysis was performed using SPSS 16.0 J for Windows.

4. Results

The mean age ($\pm$ SD) of their children was 7.01 ± 3.2 months (3–12 months) on the first survey and 21.8 ± 2.4 months (18–28 months) on the second survey. The mean age of the mothers on the first survey was 31.1 ± 4.2 years (17–41 years). Their children consisted of 136 boys (51.9%) and 123 girls (46.9%), and three mothers (1.1%) had male–female twins. Regarding the birth order of their children, 133 (50.8%) were the first child, 87 (33.2%) the second child, and 42 (16.6%) subsequent children. Twelve mothers (4.6%) were single or not living with the child's father. Regarding the feeding method, 173 mothers (66.0%) fed their babies breast milk, and 89 (34.0%) fed formula milk or mixture of formula and breast milk. Regarding the economic situation, 198 mothers (75.6%) were 'not distressed' and 64 (24.4%) were 'distressed' (slightly or very much).

Comparisons of the results of the ZSDS depression scores in all subjects, including each group classified by attribution and by sub-item score, are listed in Table 1. For all subjects, the mean ZSDS score ($\pm$ SD) was 40.6 (± 7.9) in the first survey and 40.1 (± 8.7) in the second survey. No significant difference was noted in both the first and second surveys on the paired t-test. Of the 262