Effect of Anxiety and Depression Trajectories on The Postpartum Body Weight

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Abstract

Introduction: Anxiety and depression have become a focus of concern in mood changes among childbearing women. However, less is known regarding how anxiety and depressive symptom changes over time in women underwent an elective cesarean section. This study is aimed to (1) characterize the joint trajectories of anxiety and depressive symptoms, and (2) investigate the effect of the anxiety and depression courses on the subsequent body weight. Methods: A prospective longitudinal study of childbearing women (N = 139) who underwent an elective cesarean section was conducted. Anxiety and depressive symptoms were assessed using the State Anxiety Inventory (SAI) and the Edinburgh Postnatal Depression Scale, respectively, in the third trimester and 1 day, 1 week, and 1 and 6 months postpartum. The structured questionnaires on demographic features, health status, and body mass index (BMI) were completed. Trajectory analyses were conducted using semiparametric group-based modeling. Analysis of covariance and the trend test were applied. Results: The mean age of participants was 33.6 years. Most study participants were multiparas (61.9%) and had at least some college education (73.4%). We identified four distinctive joint trajectories of anxiety and depressive symptoms: class 1 (low, 24.9%), class 2 (mild, 42.9%), class 3 (high, 23%), and class 4 (very high, 6.9%). After adjustment for age and parity, the BMIs were significantly different among the trajectories classes (p<0.05). The classes with high and very high anxiety and depressive symptoms showed a trend toward having higher BMI on postpartum 1 day (p=0.05), 1 month (p=0.03) and 6 months (p=0.06) compared with those with low anxiety and depressive symptoms. Discussion: Anxiety and depressive symptoms are prevalent from pregnancy through postpartum. Distinctive patterns of joint anxiety and depression trajectories were identified. Our findings suggest a need for greater attention to continuous assessment of psychological well-being and body weight among women with cesarean delivery. Research support: This study was supported by a grant (NSC101-2629-H-038-001) from the Ministry of Science and Technology, Taiwan.

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Keywords: Anxiety symptoms, Depressive symptoms, Cesarean delivery, Body weight, pregnant women

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1. Introduction

Anxiety and depression have become a focus of concern in mood changes among childbearing women. The elevated anxiety symptoms were found in 54% of pregnant women, whereas the depressive symptoms were estimated to be 37.1% during pregnancy Chui, et al. (2007). Approximately 24.3%~30.7% of women experience anxiety symptoms Britton (2008), while 23%~42.6% reported depressive symptoms Beck (2008) in the postpartum period. Recent evidence has found the co-occurrence pattern of anxiety and depression with a certain degree of heterogeneity in the longitudinal course in perinatal women (Heron O'Connor, Evans, Golding, Glover, 2004; Skouteris Wertheim, Rallis, Milgrom, Paxton, 2009). However, limited studies reported the joint trajectories of anxiety and depression in perinatal women.

Maternal weight retention during postpartum is an important factor in the development of obesity, cardiovascular diseases, and other chronic diseases in later life (Rooney, Schaubberger, Mathiason, 2005). Furthermore, weight gain between pregnancy may increase the risk of Cesarean section, gestational diabetes, preeclampsia, and stillbirth in the next pregnancy (Villamor, Cnattingius, 2006). Previous studies have found evidence of relation between anxiety and depression with body mass index (BMI) in nonpregnant population (Cuijpers, et al. 2010). Limited research, however, has focus on perinatal women to investigate the association between anxiety and depression with postpartum body weight.

Few studies have prospectively examined the changes in anxiety and depression symptoms from pregnancy through postpartum and weigh changes in a longitudinal design. A cross-sectional study of 64 women found a strong correlation between anxiety and depression with BMI at 4 months postpartum (Carter, Baker, Brownell, 2000). Herring et al. reported an association between new-onset postpartum depression and postpartum weight retention (Kleinman, et al., 2008). Recent review on perinatal depression and maternal weigh found an association between depressive symptoms and maternal BMI (Milgrom, Skouteris, Worotniuk, Henwood, Bruce, 2012).

Understanding the relation of anxiety and depression trajectories to postpartum body weight may help women in weight management during the postpartum period. This study examines the effect of anxiety and depression joint trajectories on postpartum weight. The objectives were to determine the extent to which (1) the joint trajectories of anxiety and depressive symptoms, and (2) investigate the effect of the anxiety and depression courses on the subsequent body weight.

2. Methods

2.1 Participants

Pregnant women who received prenatal care in the antenatal clinic of a university hospital in Taiwan were invited. Study inclusion criteria were aged 20 or above and elective Cesarean section. Exclusion criteria were perinatal complications, or chronic medical illness. Among 150 eligible women, 11 women (14%) completed baseline information only. A total of 139 women included in this study.

2.2 Procedures

The study was a prospective longitudinal study with five time points assessments conducted in the third trimester, postpartum day 1, week 1, 1 month, and 6 months, respectively. The study protocol was approved by the institutional review board of the China Medical University Hospital, Taiwan.

3. Measures

3.1 Anxiety symptoms

Anxiety levels were assessed using the 20-item Taiwanese version of State Anxiety Inventory (SAI). This tool contains a scale of 1 (not at all) to 4 (very much so) for each item, with an overall score ranged between 20 and 80. A higher score indicated higher anxiety. The Taiwanese version of SAI has shown good internal consistency (0.90) (Chung Long, 1984); in the present study, the Cronbach’s alpha of SAI was 0.89-0.91.
3.2 Depressive symptoms

Depressive symptoms were measured by the 10-item Taiwanese version of Edinburgh Postnatal Depression Scale (EPDS) (Heh, 2001). It is a self-report questionnaire with a 4-point scale that ranged from 0 (“no”) to 3 (“most of the time”), with a total score ranged between 0 and 30. Higher scores represented higher levels of depression. The Cronbach’s alpha reliabilities of the Taiwanese version of EPDS were 0.87 (Heh, 2001). In our study the Cronbach’s alpha of EPDS ranged 0.82-0.86.

3.3 Body weight and height

Self-reported data on body weight and height were collected in baseline, postpartum 1day, 4 weeks, and 6 month. Body mass index (BMI) was then calculated as the weight in kilograms divided by the height in meters squared (kg/m2).

3.4 Demographic characteristics and health status

A structured questionnaire was used to investigate demographic variable, including age, parity, education attainment, employment status, and use of patient controlled analgesic after CS.

4. Statistical Analysis

The distinct groups of subjects with similar courses of change in anxiety and depressive symptoms over time were identified using the group-based trajectory modeling (Nagin, 2005). The PROC TRAJ in SAS was applied and the optimal trajectory groups were determined based on Bayesian Information Criterion (BIC) value (Nagin, 2005). At beginning, trajectory groups for depression and anxiety were identified separately, and then the joint probability of group membership in the depression and anxiety was estimated. The relationships between membership of joint trajectories and body weight were examined by the analysis of covariance and the trend test with adjustment for covariates. The results were considered statistical significance at \( p < 0.05 \). All analyses were conducted using SAS software, Version 9.2(SAS Institute Inc., Cary, NC).

5. Results

There were 139 pregnant women with mean age 33.6 (standard deviation [SD] 3.8) and mean weeks of gestational at delivery was 37.3 (SD 2.0). Most participants were multipara (61.9%), were educated to some college education (73.4%), and employed (64%). Majority of the participants (66.2%) reported a planned pregnancy and nearly 85.6% had used patient controlled analgesic after Cesarean section. Among the 139 eligible participants, 102 (73%) completed in all five time points and all of the women (100%) completed four assessments. No significant differences (\( p=0.18-0.99 \)) on mean depression or anxiety scores at the time 1, 2, 3, or 4 were observed between the two groups. The demographic characteristics, were similar (\( p=0.14-0.90 \)) between the two groups including age, parity, education, prenatal employment.

5.1 Trajectory groups of Depressive Symptoms and Anxiety Symptoms

The three depression trajectory groups were identified as the best fitting model with the lowest absolute BIC (-1908.08) with the average posterior probability ranging from 0.87 (standard error [SE] = 0.13) to 0.91 (SE = 0.12), suggesting adequate model fitting. The 4-group model was identified for anxiety symptoms (BIC -2260.19) with the average posterior probability ranged from 0.87 (SE = 0.16) to 0.97 (SE = 0.08). The joint analysis of depression and anxiety trajectories indicated the proportion of women in each joint trajectory groups, including the low symptom severity (24.9%), mild levels of depressive and anxiety symptoms (42.9%), followed by women with high levels on
both depressive and anxiety (23%), and women with high depressive symptoms and very high anxiety symptoms (6.9%).

5.2 Relationships between Joint Trajectories and BMI

According to the analysis of covariance, the BMIs were significantly different among the trajectories classes (p<0.05) after adjustment for age and parity. The classes of women with high and very high anxiety and depressive symptoms having higher BMI on postpartum 1 day (p=0.05), 1 month (p=0.03) and 6 months (p=0.06).

5. Discussion

In this prospective study, we identified four distinct joint trajectories of depression and anxiety among in women undergoing Cesarean section. As compared with those with low anxiety and depression trajectory, higher BMIs were found in women with high and very high levels of anxiety and depression after the adjustment for age and parity.

Consistent with prior research on anxiety and depressive symptoms over time (Coyne, et al. 2009), we found the heterogeneity in the development of anxiety and depressive symptoms during childbearing period. Further, our findings indicated that a substantial proportion of CS mothers reported high/very high anxiety (36%; SAI >45) or high depressive symptoms (27.3%, EDFS >12) at all assessments, suggesting that stable nature of both symptoms and proper screening could be used to identify the high risk group. The four joint trajectories of anxiety and depression identified in the current study provided evidence of persist and cluster patterns of anxiety and depressive symptoms in perinatal women.

The association between anxiety and depression with body weight is complex with a reciprocal relationship reported (Markowitz, Friedman, Arent, 2008). Dysregulation of the hypothalmic–pituitary–adrenal axis may be one of the important factors for the biological mechanism underlying the relationship between anxiety and depression with obesity (Bornstein, Schuppenies, Wong, Licinio, 2006). Anxiety and depression also could be a barrier for weight management for women and lead to more postpartum weight retention (Utter, et al., 2004) through postpartum. Distinctive patterns of joint anxiety and depression trajectories were identified. Our findings suggest a need for greater attention to continuous assessment of psychological well-being and body weight among women with cesarean delivery.

References


