

Age-related anxiety and self-assessment of perinatal depression risk: A web-based study

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Abstract

Purpose: To investigate the relationship between pre- and postpartum anxiety and self-assessment of perinatal depression (PD) risk in pregnant women. **Methods:** We recruited volunteers for an anonymous questionnaire survey using an app service for pregnant and nursing mothers (Luna Luna Baby, MTI Co Ltd) from November 19 to 30, 2018. The questionnaire consists of 30 items on anxiety during and after pregnancy. Multivariate logistic regression analysis was performed with age, occupation, history of pregnancy, and self-assessment of PD risk as explanatory variables. All statistical analyses were performed using Stata software, Version 15.0. The study was approved by the ethics committee. **Results:** A total of 1987 pregnant women responded. In both pregnancy and postpartum periods, women aged 19 years or younger felt the most anxious about their financial situation (17/25, 68%). Women in their 20's to 30's were the most worried about the baby's safety (1162/1893, 60.1%). Those with a higher self-estimated risk of PD tended not to list the baby's safety as an anxiety item, but listed money, financial situation, and mother's own health as concerns. The percentage of those who worried about the baby's safety was significantly lower in women with a self-assessed PD risk of 90% or higher. **Conclusions:** The causes of the anxiety in the pregnancy and postpartum periods may be correlated with age and risk of PD. Health care providers may need to consider the possibility of PD development in pregnant women with high anxiety regarding their financial conditions, health, or raising children.

Introduction

Suicide is the number one cause of maternal death in Japan. The suicide rate among pregnant and postpartum women in Tokyo's 23 wards is 8.7/100,000 deliveries [1], which is higher than that of the United States (2.0/100,000 deliveries) [2] and the United Kingdom (2.8/100,000 maternities) [3]. The global average prevalence of perinatal depression (PD) is 17.7% and varies greatly from country to country [4]. The incidence of PD in Japan has been reported as 4.0 - 27.0% [4,5]. However, it has been revealed that 102 pregnant and postpartum women committed suicide in a 2-year period, and this shocked the society [6]. It was estimated that approximately 16,000 pregnant women in Japan need mental health support for a year postpartum [7].

In 2017, the Japanese Society of Perinatal Mental Health published the Perinatal Mental Health Consensus Guide [8], and the municipality has begun to subsidize postpartum health care, including screening for PD [7]. There were several reports on risk factors of PD such as maternal anxiety, stress, history of depression, lack of social support, unintended pregnancy, first pregnancy (primipara), current physical or psychiatric illness treatment, emergency cesarean section, and low satisfaction with the birth experience [9 -12].

A cohort study with 479 primiparas aged over 35 years suggested that the strong concern about the baby's care and mother's own life after discharge were risk factors of PD [11]. The Japanese Perinatal Mental Health Consensus Guide states that health care providers need to evaluate pregnant women who have strong anxiety about their pregnancy, which is risk factor for developing PD [8]. However, there are

few studies on the relationship between maternal anxiety and their age, occupation, and PD risk. In the current study, we administered a web-based questionnaire to investigate the relationship between pre- and postpartum anxiety and self-assessment of the estimated risk of PD in pregnant women.

Methods

We recruited volunteers for an anonymous questionnaire survey using an app service for pregnant and nursing mothers (Luna Luna Baby, MTI Co Ltd) from November 19 to 30, 2018. The questionnaire consists of approximately 30 items (About 8 minutes) on anxiety during pregnancy and postpartum and awareness of PD (Index1). We asked the study participants to choose the top three factors of anxiety from 23 items during/after childbirth (questionnaire text: "Please choose three most anxious things."). We also asked about the self-assessed risk of PD (questionnaire text: "How much do you think you have the potential to develop "postpartum depression?" There are 6 answer options: 0%, 10-30%, 30-50%, 50-70%, 70-90%, 90-100%"). Multivariate logistic regression analysis was performed with age (Ages 19 years and younger, 20-29 years, 30-39 years, and older than 40 years), occupation (full-time housewife, office employee, part-time worker, public employee, student, self-employed, unemployed, and other), history of pregnancy (whether primipara, multipara, or has experienced miscarriage or abortion), and self-assessment of PD risk as explanatory variables. All statistical analyses were performed using Stata software, Version 15.0 (StataCorp LP, College Station, TX). In the survey, the word "postpartum depression" was used instead of "perinatal depression (PD)" because it was the more familiar term to the general public. In developing the questionnaire, we asked one psychiatrist and two women who were raising children to check if the sentences and answer choices were clear. In this study, the purpose of the questionnaire was displayed on the mobile phone screen, and the questionnaire was administered only to those who agreed to participate in the study. Since this was an anonymous questionnaire survey, no written consent from individual participants was obtained. No authors and participants got money nor payment in the current study. The study was approved by the Yodogawa Christian Hospital's ethics committee (Approval Number 2018-051).

Results

A total of 2979 participants (1987 pregnant women, 971 postpartum women, and 21 others) responded. Nine hundred ninety-two participants who were not pregnant were excluded from the analysis. The participants belonged to different age groups: 19 years or younger (n=32), 20-29 years (n=1096), 30-39 years (n=1743), and 40 years or older (n=108). The percentage of primiparous women was 39.7%, and 78.2% of nursing mothers were within 6 months post-delivery. The most common occupation was office work (39.9%).

Anxiety during pregnancy

In the analysis of anxiety during pregnancy in terms of age group, pregnant women in their 20's to 30's

were most worried about "will the baby be born safely?" (1162/1893,60.1%). Among those under 19 years old, "anxiety about money and financial conditions" was the most frequently reported concern (17/25, 68%). Among those over 40 years old, "will the baby be born with an intact body?" and "will the baby be born safely?" (44/69, 63.8%) were the most frequently reported concerns (Table1). We then performed multivariate logistic regression analysis for the anxiety about "the baby's safety" with age group, occupation, pregnancy history, and self-assessment of PD risk as explanatory variables. The odds ratios for raising the baby's safety were compared based on a self-assessed PD risk of 0%, aged 20–29 years, being a full-time housewife, and first pregnancy as references (Table2). Those with a higher self-estimated risk of PD tended to not list baby's safety as an anxiety item, but listed money, financial situation, and mother's own health as concerns. The percentage of those who worried about the baby's safety was significantly lower in women whose self-assessed risk for PD was 90% or higher or who had experience giving birth.

Postpartum anxiety for pregnant women

In the analysis of postpartum anxiety by age group, those in their 20's and 30's were most worried about "can you raise your children well? (baby care)" (Table 3). However, those under 19 (21/25, 84%) and those over 40 years (32/69, 46.4%) were most worried about "money and the financial situation." Baby care caused the most anxiety after childbirth for the pregnant women (912/1987,45.9%). Next, multivariate logistic regression analysis was performed for raising the baby as a factor of anxiety with explanatory variables including age group, occupation, pregnancy history, and self-assessment of PD risk. An analysis of odds ratios was based on references of a self-assessed PD risk of 0%, aged 20-29 years, being a full-time housewife, and first pregnancy (Table 4). It revealed that many women with a high self-assessed risk score of PD were concerned about their ability to raise children. There was no difference in anxiety for "can I raise my children well?" according to occupation, and anxiety was lower in multiparous women over 30 years old. Compared with other occupations, office workers had more anxiety about returning to work after childbirth.

Discussion

The current study was a large-scaled online questionnaire survey that investigated whether the content of anxiety in pregnancy and postpartum varied by age, occupation, and self-estimated risk of PD. Anxiety during pregnancy may vary from person to person, but our study suggested that there was a large trend among different age groups. In Japan, the number of suicides among pregnant women was high in the 2nd month of pregnancy as per a previous research [7], which suggests that the findings of the current study could be useful for PD prevention measures in terms of decreasing suicide during pregnancy. Fifty-six percent of the study participants were 30-39 years old. Considering the average age (30.7 years old) of first childbirth in Japan (2016) [13], the results of these research participants could be generalizable to the population of women experiencing pregnancy and childbirth in Japan".

In terms of the anxiety during pregnancy stratified by age groups, the anxiety about "will the baby be born safely?" was the most common among pregnant women in their 20's to 30's. On the other hand, those under the age of 19 were most worried about money and financial conditions while those over the age of 40 were most worried about whether the baby would be born with an intact body. These results suggested that many pregnant women were most concerned about the safety of their children at childbirth, resulting in less concerns about their own health. Since there is always the possibility of new complications during pregnancy (such as gestational diabetes and pregnancy-induced hypertension), it is necessary to raise self-awareness of the physical conditions of mothers.

In both pregnancy and postpartum periods, those aged 19 years or younger had the highest level of financial anxieties. The result indicated that healthcare providers involved in young pregnancies always need to carefully interview about the mothers' financial conditions and provide information about financial support. Pregnant women over the age of 40 had the most concerns about fetal abnormalities as well as the baby's safety. In developed countries including Japan, the maternal age at the time of pregnancy has been increasing [13], and anxiety about fetal abnormalities will further increase in the future. The Japan Society of Obstetrics and Gynecology (JSOG) introduced noninvasive prenatal testing (NIPT; used for the detection of trisomy 21, trisomy 18, and trisomy 13) as a clinical study and provided the test for \$1,800/time (200,000 yen/time) at accredited institutions in 2013. Pregnant women aged 35 years or older and those with evidence of chromosomal abnormalities could participate in the study. Based on a recent report, 61,330 tests were performed over a 3-year period [14]. Since the need for prenatal diagnosis for pregnant women continued to grow, the JSOG announced that the availability of NIPT would be extended to general obstetrical clinics in 2019 [15]. Given the predominately greater anxiety regarding fetal abnormalities among women older than 40, and the opening of the restrictions on NIPT testing, the need for in-pregnancy counseling for all pregnant women 40 years and older should be addressed.

In the multivariate logistic regression analysis of anxiety during pregnancy in our study, those with a higher self-estimated risk of PD tended to list financial situation, and mother's own health and physical condition as big anxiety. The proportion of listing baby's safety as a factor of anxiety was significantly lower when their self-estimated risk of PD was 90% or higher. These results suggested that women who are concerned about their own health and financial conditions need to be considered as at-risk for PD and given support during both pregnancy and postpartum.

With regard to postpartum anxieties of pregnant women, childcare anxiety was the most common among 20-30 year-olds in the current study. Women under 19 and over 40 years old were very anxious about money and their financial condition. With regard to childcare, individual differences were too large, and the information from healthcare facilities tends to be limited to the physical changes in the mother's body after childbirth. The results of this study suggest that the main concern of mothers after childbirth is child-rearing and that it is necessary to provide information about childcare much more during the pregnancy period. Multivariate logistic regression analysis revealed that women with a high self-

estimated risk of PD were more likely to be anxious about their ability to raise children. This study suggests that providing support to mothers with strong feelings of anxiety about raising children could reduce the risk of PD.

Limitations

In this study, we conducted a questionnaire survey of expectant and nursing mothers using the app, which may differ from the general population. However, the app had the highest usage among female users in Japan (11 million downloads, 2017) and we could assume that many pregnant women were also using it. The results of the study may not be generalizable to the Japanese population at large owing to the selection bias that could have been introduced because of the study method adopted, that is, online survey. Hence, the results are indicative of trends in the internet literate population only.

Further, recall bias could be involved in reporting anxieties during and after pregnancy. The self-estimated risk of PD could not be directly related to the risk of developing PD because it was a self-assessment and was not based on objective indicators. Future studies with samples representative of a wider population and using more validated methods are recommended.

Conclusion

The causes of the anxiety in the pregnancy and postpartum periods may be correlated with age and risk of PD. Special attention should be given to the financial situation of young and older pregnant women. Healthcare providers should consider the possibility of PD developing in pregnant women with high anxiety about their financial conditions, health, or raising children.

List Of Abbreviations

□PD: peripartum depression

□The Japan Society of Obstetrics and Gynecology (JSOG)

Declarations

Research involving Human Participants: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee (the Yodogawa Christian Hospital's ethics committee; Approval Number 2018-051) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent□In this study, the purpose of the questionnaire was displayed on the mobile phone screen, and the questionnaire was administered only to those who agreed to participate in the study.

Since this was an anonymous questionnaire survey, no written consent from individual participants was obtained. No identifying details were obtained in the survey.

Availability of data and material: Derived data supporting the findings of this study are available from the corresponding author on request.

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Authors' Contributions: All authors contributed to the study conception and design. Research design and material preparation were performed by Ayako Shibata. Data analysis were performed by Daisuke Shigemi. Nobuyuki Maruo supervised the research conduction. The first draft of the manuscript was written by Ayako Shibata and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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