The Inter Relationship of Mental State between Antepartum and Postpartum Assessed by Depression and Bonding Scales in Mothers

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博 士 論 文

The Inter Relationship of Mental State between Antepartum and
Postpartum Assessed by Depression and Bonding Scales in Mothers

（妊娠期と産褥期における母親のメンタルヘルスならびに愛着の関連）

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Introduction

Recently, child abuse is one of social concerns. The prevalence handled by child consultation centers in Japan was 73,765 in 2013, which has been increasing each year. It has been reported that infants account for over 50% of all children who die as a result of abuse. Among the infants who died with abuse, many newborn babies were included [1].

Several studies indicated that postpartum mental health (anxiety of child-rearing, depressive state) might be related to child abuse [2] [3]. On the other hand, several researchers have found a relation between antepartum mental health and child abuse [4] [5]. Women tend to become psychologically unstable not only in the postpartum period but also in the antepartum [6]. As factors related to antepartum psychological disturbances, there are pregnancy in adolescence, lack of the social support, the unplanned pregnancy, the marital infighting, and negative life events. It has also been discussed that the mental health of a pregnant woman might influence the development of the fetus [7]. It is a possible that the mental health of mothers in the antepartum period will be related to that in the postpartum period. If this is true, providing appropriate mental health support for mothers in the antepartum period may contribute to the reduction of child abuse. However, there is a lack of reports demonstrating whether the mental health of mothers in the antepartum period affects that in the postpartum period.

Therefore, we examined the mental state in both of antepartum and postpartum in mothers assessed by the Edinburgh Postnatal Depression Scale (EPDS) and Mother- Infant-Bonding-Scale (MIBS), and compared the results.

2. Materials and Methods
2.1. Participants

This study was conducted at a university hospital located in an urban area in Japan. Mothers were surveyed twice, one during antepartum medical checkups (from 20 weeks of gestation to 36 weeks of gestation) and one during postpartum medical checkups (1month after birth). The participants were enrolled in this study based on the following criteria 1) age over 20 years, 2) without present or history of psychiatric diseases, and 3)

permission of attending doctor. Out of 215 women who gave written informed consent to participate, 162 women (75.3%) completed the study. As the reasons of dropping out of the study were the NICU hospitalization of neonates and the changes in the birth institution or home address. Finally, we analyzed 134 participants who completely finished the study in both of antepartum and postpartum period. This study was approved by the Ethics Committee of the University of Tokyo.

2.2. Methods

This study was a longitudinal study which investigates the mental health and the bonding to the fetus or neonate of mothers in both of antepartum and postpartum. The mental state of mothers in this study means that it was assessed by EPDS and MIBS.

1) Characteristics of Participants

Information on characteristics of participants was collected from medical records in antepartum and postpartum. Information collected in the antepartum consisted of occupational status, marital status, parity, morning sickness, worries about costs. Information collected in the postpartum consisted of gestational week at the delivery, mode of delivery, obstetrical disorders during labor, baby's weight and sex, APGAR score, umbilical blood pH, breast feeding and troubles with breast feeding.

2) Family Function

We examined Family APGAR score two times to evaluate the degree of the social support. The Family APGAR was introduced by Smilkstein in 1978 to assess satisfaction with social support from the family in adulthood, which was composed of five items measuring perceived family support in the domains of adaptation, partnership, growth, affection, and resolve. It was translated into Japanese by Nagamine [8]. This is scored on a three-point Likert scale (0 - 2), and the total score range from 0 - 10 points. Score of less than 7 points indicate family function deficiency. The reliability and the validity of this score were tested [9] [10].

3) Measurement of Mental Health

a) EPDS

EPDS is a self-reported questionnaire composed of 10 items scored on a four-point Likert scale (0 - 3) designed to assess antepartum and postpartum

depression [11]. It does not include items related to physical symptoms because it was thought up not to be affected by the physical symptoms in the postpartum. Score of 9 points or more are considered to be suspicious in depression after delivery as Japanese definition [12]. In this study EPDS scoring are classified into two group; 9 points or more and less than 8 points.

 b) MIBS

MIBS was based on a study by Kumar and Marks [13], and it was translated into

Japanese by Yamashita [14]. MIBS is a self-reported questionnaire composed of 10 items on a four-point Likert scale. A high MIBS score indicates worse of mother's bonding forward to baby. If the score of MIBS is zero, mothers do not have any bonding disorders [13]. MIBS evaluates two factors, the first one is "lack of affection" and the other one is "anger and rejection". "Anger and rejection" is used as a direct risk factor for child abuse [15].

 4) Statistical analyses

SPSS Statistics 23 for Windows was used to analyze the descriptive statistics. Antepartum and postpartum scores were tested using the paired t-test and Fisher's exact test. The dependent variables were postpartum EPDS score and Bonding score, and the independent variables were each score of antepartum and participants characteristics and Family APGAR score. The level of statistical significance was set to P < 0.05.

3. Results

3.1. Characteristics of Participants

Table 1 shows the participants characteristics. The mean age was 34 ± 4.2 years (range 24 to 43 years). Among the participants, 58.9% were employed. The percentages of primipara and multipara were 58.9% and 38.8% respectively. Seventy-nine percent of the participants had morning sickness, and 11% were worries about delivery and baby care costs. The mean gestational week of pregnancy was 40 ± 2.3 weeks. The rates of vaginal delivery and caesarean section were 93.2%, and 6% respectively. Among the participants, 71.6% had an abnormality, for example, labor induction during the delivery process.

The mean weight of the newborns was 6.7 ± 0.9 lb. Concerning on breastfeeding, breastfeeding only, combination of breastfeeding and bottle-feeding, were 47.7%, 40.2%, respectively. Trouble with breastfeeding

was found in 25.3% of the participants had.

3.2. Family Function

Family APGAR score which measured the family function in the antepartum period was 8.9 ± 1.5 points, while that in the postpartum was 8.7 ± 1.6 points (Table 1).

3.3. Mental State of Mothers in the Antepartum and Postpartum

1) Depressive state: An antepartum depressive state (EPDS score more than 9 point) was 14.1% (19/134), while postpartum depressive state was 17.9% (24/134). The mean EPDS score in the antepartum and postpartum periods were 4 ± 3.8 points and 4.9 ± 3.8 points, respectively. There were significant differences in depressive points assessed by EPDS between the antepartum and postpartum periods (p = 0.015) (Table 2). Mothers with an antepartum depressive state were 14.7 times more likely to have a postpartum depressive state than those without an antepartum depressive state (Table 3). The factors which influenced the depressive state were "worries about costs" (p = 0.00), "postpartum family function" (p = 0.04) in the antepartum period, "worries about costs" (p = 0.02) and "postpartum family function" (p = 0.04) in the postpartum period (Table 4).

2) Bonding disorder: We judged not antepartum bonding disorder was 41.7% (56/134), and not postpartum bonding disorder was 28.3% (38/134). The mean ± standard deviation MIBS score was 2.4 ± 2.4 points in the antepartum period and 1.5 ± 2 points in the postpartum period. There were significant differences in bonding points assessed by MIBS between the antepartum and postpartum periods (p = 0.00) (Table 2). Mothers with an antepartum bonding disorder were 5.7 times more likely to have a postpartum bonding disorder than those without antepartum bonding disorder (Table 5). The mother who had "lack of affection" of the one factor in antepartum was 55.9% (75/134) and postpartum was 39.5% (53/134). And, the mother who had "anger and rejection" of the other factor in antepartum was 52.9% (71/134) and postpartum was 46.2% (62/134). We compared the score of postpartum with antepartum with a paired t-test. As a result, "lack of affection" significantly decreased from antepartum to postpartum (p = 0.00). In "anger and rejection" which were no significant differences between antepartum and postpartum (p = 0.3) (Table 2). The factors which influenced

the bonding disorder were "morning sickness" (p = 0.03), "worries about costs" (p = 0.01) and "antepartum family function" (p = 0.00) in the antepartum period, and "antepartum family function" (p = 0.003), "breast feeding" (p = 0.04), and "postpartum family function" (p =0.00) in the postpartum period (Table 4).

3.4. Relationship between Antepartum Bonding Disorder and Postpartum Depressive State

We examined the relationship between bonding disorder in antepartum and relation of the depressive state in postpartum. As a result, 23 of 96 mothers who had bonding disorder in antepartum had depressed mental state in postpartum. Mothers with an antepartum bonding disorder were 11.7 times more likely to have a postpartum depressive state than those without antepartum bonding disorder (Table 6).

4. Discussion

This is the first study to demonstrate that depressive state and bonding disorders of mothers in antepartum period may be related to those in the postpartum period. Also, worries about costs and poor family function were causes of the mental stresses sustained from the antepartum period to the postpartum period in mothers. Furthermore, there was a correlation between bonding disorders in the antepartum period and depressive state in the postpartum period.

According to our results, mothers with a depressive state in the antepartum period sustained the depressive state in the postpartum period, with a relative risk ratio of 14.7 compared to mothers without depressive state in antepartum. It is suggested that antepartum depressive state may be a suitable factor for predicting postpartum depression [16]-[18]. Worries about costs and poor family function were found to be mental stress factors contributing to a sustained depressive state from the antepartum to postpartum period in mothers. When worries about costs and poor family function are present during antepartum in mothers, we need to consider use of various social supports, which are important for improving mental health [19]. However, poor family function in mothers with a depressive state has several psychological symptoms, such as sadness, apathy, anxiety, and decreased self-esteem [20]. Therefore, even if mothers with depressive state

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received enough supports from the family, mothers might not accept supports from family. It is suggested that the care to the whole family including mothers with depressive state may be necessary for the important of family function.

There were significant differences in the bonding of mothers to their babies between the antepartum and postpartum periods. The negative feelings of mothers towards the fetus in the antepartum period diminished in the postpartum period. It is difficult for pregnant mothers to form strong bonding to their fetuses only by ultrasonographic imaging. However, once the babies are born and mothers can hold and nurse them, the mother's negative feelings toward the baby reduce. MIBS was evaluated by two aspects, "lack of affection" and "anger and rejection". "Lack of affection" improved in the postpartum period compared with the antepartum period, while "anger and rejection" did not improve in the postpartum period. Also, poor family function which exerts as a mental stress factor in both of the antepartum and postpartum periods contributes to sustained bonding disorders from antepartum to postpartum in mothers. The "anger and rejection" score of MIBS represents a direct risk factor for child abuse [13] [15]. Therefore, health professionals should pay much attention to mothers who have "anger & rejection" for a fetus in the antepartum period.

When postpartum depression was used as a dependent variable in the statistical analyses, a bonding disorder in the antepartum period was significantly associated with postpartum depression. Also, of the 38 participants without bonding disorder to the fetus in the antepartum period, only one showed a postpartum depressive state in the postpartum period. It is suggested that the bonding disorder of mothers in the antepartum period is a predictor of depressive state in the postpartum period. Health professionals should coordinate interventions to improve bonding of mothers to their babies from the antepartum period. The Siddiqui et al. demonstrated that fetus imaging through ultrasonography could be effective on the promoting of mother's bonding to fetus. It was reported that the bonding of mothers to their fetus might precede the establishment of the mother and fetus (child) relationship [21]-[23]. Interventional programs to improve the bonding of mothers to their fetus may prevent postpartum depression in mothers.

We concluded that a depressive state and bonding disorders of mothers

in the antepartum period are related to those in the postpartum period. Also, the bonding disorders in the antepartum period were associated with a postpartum depressive state. Worries about costs and poor of family function were related to the depressive state of mothers in both of the antepartum and postpartum. It is essential that the health professionals evaluate the mental health of mothers and the related factors in the antepartum period, and provide to improve their mental health. In antepartum, we emphasize the importance of antepartum mental health assessment as a predictor of postpartum depression and bonding disorder in mothers.

The limitations of this study were that the number of participants was small and the location of this study was limited to only one hospital. Therefore, it is necessary to conduct further investigation in multiple hospitals.

Regarding child abuse prevention, when "anger & rejection" was apparent feelings toward the baby during the antepartum period, continuous support is clearly needed. Because mothers who have negative feelings toward their fetus can easily become depressed in the postpartum period, intervention should be conducted to prevent child abuse.

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Table 1　Participants characteristics　　　　　　　　　　n＝134

	Mean±SD or percent
Age （years old）	34±4.2
Occupation	58.9%
Marital status	first 91%
	second　4.4%
	not marriage　2.2%
parity	primipara　58.9%
	multipara　38.8%
Morning sickness	79.1%
Worries of the costs*	11.1%
Family APGAR in antepartum （points）	8.9±1.5
Gestational weeks at delivery (weeks)	40±2.3
Vaginal delivery	93.2%
Caesarean section	6.0%
Abnormality in a delivery process	71.6%
Baby's weight　（g）	3030±400
Umbilical blood pH	7.3±0.1
Breast feeding only	47.7%
Combination feeding	40.2%
Bottle feeding only	3.7%
Troubles on breast feeding	25.3%
Family APGAR in postpartum （points）	8.7±1.6

*Delivery and baby care costs

Table 2　Evaluate of measures　　　　　　　　　　　　　　　　　n=134

	antepartum	postpartum	p-value
EPDS	4±3.8	4.9±3.8	**0.015**
Bonding Scale	2.4±2.4	1.5±2	**0.000**
Lack of affection	1.6±1.9	0.8±1.3	**0.000**
Anger & Rejection	0.8±1.0	0.7±1.0	0.3

Paired t-test

Table 3　　Relationship between postpartum depressive state and antepartum depressive state

| | | Postpartum EPDS | | Odds ratio |
		Over 9 points	Under 8 points	95%CI
	Over 9 points	12*	7	14.7
Antepartum				(4.9-44.5)
EPDS	under 8 points	12	103	reference

*Fisher's exact test　p=0.000

Table 4　Predictor of the depressive state and bonding disorder

n=134

	Depression state				Bonding Disorder			
	Antepartum		Postpartum		Antepartum		Postpartum	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Age	1.2(1-1.6)	0.23	1 (0.9-1.1)	0.93	1.1(1-1.3)	0.61	1 (1-1.1)	0.41
Parity	0.08(0.01-0.6)	0.52	1 (0.5-1.8)	0.90	1(0.4-2.8)	0.09	0.6 (0.4-1.0)	0.07
Morning sickness	3.7(0.1-143.8)	0.87	1.2 (0.4-4)	0.73	0.1(0.02-0.8)	0.03	1.4 (0.6-3.2)	0.49
Worries about costs*	46(3.7-566.6)	0.00	3.7 (1.2-11.6)	0.02	4.4(0.4-46.2)	0.01	2.1 (0.6-7.0)	0.21
Family AP in antepartum	0.7(0.2-2.2)	0.04	0.8 (0.2-3.1)	0.68	0.8(0.4-1.7)	0.00	0.6 (0.5-0.9)	0.003
Abnormality in delivery process	3.8(0.3-43.3)	0.73	1.4 (0.5-4.0)	0.56	2.6(0.7-9.4)	0.44	1.6 (0.7-3.6)	0.23
Baby's weight	0.2(0.01-1.7)	0.93	1.8 (0.7-4.6)	0.25	0.6(0.2-1.9)	0.91	1.9 (0.9-4.1)	0.11
Umbilical blood pH			7.4(0.01-4477.9)	0.54	0.01(0.0-12.9)	0.86	0.1 (0-15.1)	0.41
Breast feeding only			0.5 (0.2-1.5)	0.24			0.46 (0.2-1)	0.04
Bottle feeding only			6.6 (1-44.9)	0.05			0.3 (0.04-2.0)	0.21
Troubles on breast feeding	4.7(0.4-54.3)	0.09	1.1 (0.4-3.2)	0.81	0.7(0.2-2.6)	0.03	2.1 (0.9-4.9)	0.08
Family AP in postpartum	2.8(0.9-9.1)	0.00	0.8 (0.6-1)	0.04	2.4(1.2-4.9)	0.01	0.2 (0.1-0.7)	0.00

*Delivery and baby care costs

Table 5　　　　Relationship between postpartum bonding disorder and antepartum bonding disorder

	Postpartum Bonding score		Odds ratio
	Over 1 points	Point 0	95%CI
Antepartum Bonding Score Over 1 points	67*	11	5.7
			(2.5-13)
point 0	29	27	reference

*Fisher's exact test　p=0.000

Table 6　Relationship between antepartum bonding disorder and postpartum depressive state

| | Postpartum depressive state | | Odds ratio |
	Over 1points	Point 0	(95%CI)
Over 1 points	23*	73	11.7
Antepartum			(1.5-89.7)
Bonding Score			
Point 0	1	37	reference

*Fisher's exact test　p＝0.001