Chapter

The Outcome of Eating Disorders: Relapse, Childbirth, Postnatal Depression, Family Support

Mariko Makino, Mitsuo Yasushi and Masahiro Hashizume

Abstract

This study was aimed to identify eating disorder (ED) relapse, childbirth, postnatal depression,and the family support. Of the ED patients during treatment from 1994 to 2004,55 were pregnant and had ED recovery. Of them, 25 (21 Bulimia Nervosa (BN)and 4 Anorexia Nervosa (AN)) agreed to take part in this study. We interviewed them every 2 wk. both during the pregnancy and after childbirth. We also interviewed family members each month. The Eating Attitudes Test-26 (EAT-26) and Edinburgh Postnatal Depression Scale (EPDS) were helpful for diagnosing the EDs and postnatal depression. As the statistical analysis, We conducted t-test.67%relapsed ED while pregnant and 50%relapsed postnatal. In the non-relapse group, all the subjects had vaginal delivery and their infants were male. 50% of the subjects had postnatal depression. Non-Postnatal depression group had average body- weight infants. With regard to family support, there was no relationship between ED relapse and postnatal depression. We found that the rate of ED relapse and that of suffering from postnatal depression were remarkable in this group, suggesting the necessity for long-term follow-up for the EDs.

Keywords: eating disorders, pregnancy, relapse, postpartum depression

1. Introduction

Anorexia nervosa (AN) and Bulimia nervosa (BN), are characterized by clinical conditions in body shape and eating attitudes. The core feature of AN is cognitive abd affective disturbance in body image. For example, subjects with AN thought themselves as fat even when they are very thin. They deny the severe thinness to their body weight and have afear of weight gain together with a constant desire for thinness. Thus, they fail to maintain an adequate body weight and shape; girls and women with AN may experience amenorrhea.BN is always concern about their body weight and shape, leading to binging and self-vomiting [1–3]. Claydon et al. [4] concluded that higher risk for relapse of ED was a maternal period and it was a difficult time for EDs with mind and body. In addition, Nakai et al. [5] reported postnatal depression had a close relationship with EDs. One of the recent studies, Watson et al. [6] showed both mothers and their infants complications

were detected during pregnancy and afterbirth.Ex-EDwomen may give birth to premature babies; infants born to these women's' infants may not have an appropriate weight. This study was designed to assess ED relapse rate during pregnancy and after childbirth as well as postnatal depression in women experienced complete remission from EDs. Moreover, we investigated the relationship between ED relapse and postnatal depression, and family support.

2. Methods

This study was conducted at the Makino Clinic. The ethical committee of the Makino Clinic approved this research (Approved 002). The study purpose and outline were explained to patients, and written informed consent acquired. We treated 1008 EDs at our outpatient clinic between 1994 and 2004. Of these patients, 55 patients experienced ED recovery, pregnancy, and childbirth. Of which, 21 BN and 4 AN agreed to partake in this study; However, we examined 24,because unfortunately, 1 patient experienced a miscarriage. These participants had long-term treatment for EDs. However, they acquired complete remission. We determined remission as 6-months symptoms -free condition. There were some reports for definition of recoveries. Symptoms-free status in the previous 90 d.by Levallious et al. [7] Bardone-Cone et al. [8] reported it as the absence of symptoms in the previous 3 mon, while Zerwas et al. [9] indicating the recovery by 1 y without no symptoms. We chosed a midpoint of these reports. The Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association 2013) [2] does not precisely outline the criteria to consider ED in remission. In Japan, there were no particular determined symptoms used to define remission or recovery. Thus, we made to meet the contents for the including and excluding criteria of the patients and for diagnosing ED remission according to the literature [10, 11]. Then, we examined participants experienced the remission for 6 mon. The Japanese version of the Eating Attitudes Test-26 (EAT-26) made by Ujiie and Kono [12] was adopted for diagnosing of EDs. The Japanese version of the Edinburgh Depression Scale (JEPDS), a self-filled questionnaire, developed by Okano [13] was used as a reference to diagnose postnatal depression as well as the interview.

3. Contents of the including and excluding criteria and questions in detail

3.1 Inclusion and remission criteria

EAT26 ≤ 9, healthy eating behavior, ability to do ordinary activities without difficulties, working for the members of the society to some extent, having no other psychotic disorders, having not irregular menstruation: For AN patients, normal menstruation,weight increase was not always necessary.

3.2 Exclusion criteria

EAT26 ≥ 9, Complication suffering from other psychotic disorders, such as depression and addiction, serious dependency or obsession with food, preoccupation with thinness, afraid of being fat seriously, having irregular menstruation.

3.3 Interview questions during pregnancy and after delivery

We asked the patients if they had panic, depressed about being mother, always preoccupied with food, unsatisfied with their body weight and shape,and if they have an urge to binge or vomit. Using the structured interview according to DSM-4 [14]. Once a month, their husbands were also asked if their spouse had an abnormal eating attitudes or obsessive compulsive thinking for eating etc.

We interviewed the patients every 2 weeks both during gestation period and after birth.

3.4 Postnatal depression

We used the JEPDS. In JEPDS, Usually scored >12 were diagnosed as depression, though, we interviewed those who scored>9.because they could have postnatal depression [13].

3.5 Relapse group (TRED group)

In hyperemesis symptoms or pregnancy sickness, pregnant women experienced nausea overeating and vomiting. These symptoms were very similar to those of ED symptoms. However, if the patients were motivated to reduce their weight to become thinner these thoughts were dissimilar from those suffered from hyperemesis. Thus, we decided those who had vomit and binge and feelings above mentioned was given name as the relapse group. In our cases, their symptoms disappeared during pregnancy, they were given name as the temporary relapse group during pregnancy. (TRED group).TRED group recovered within 3 mon of pregnancy. Also non-relapse participants during pregnancy was given name as non-relapsing group (NRED group).

3.6 Statistical analyses

We conducted t-test to determine the statistical difference between means of two different groups.

We compared the results of the TRED group and NRED group while pregnant and postnatally. Moreover, we examined the results of the postnatal depression and the non-depression group for 3 months following childbirth. A p value of, $\leqq 0.05$ was considered significant, and a p value of ≤ 0.1 was considered marginally significant.

4. Results

4.1 Patients characteristics

The characteristics of interviewed women who were recovering from EDs,assessed during their pregnancy and after childbirth are showed in **Table 1**. Sixteen patients (67%)had temporary ED relapse. We made the **Figure 1** to highlight these results clearly after **Table 1**.

We have previously reported that characteristics of women who have recovered from EDs in detail [1].

4.2 TRED group and NRED group

Sixteen (67%)showed temporary relapse within 3 mon of pregnancy. All the infants in the NRED group were male. With respect to ED relapse after childbirth,

Age at onset of diagnosis	16.6 (SD 3.3)
Disease duration (years)	9.5 (SD 5.4)
Age at remission(years)	26.1 (SD 5.3)
Maternal age(years)	28.1 (SD 5.4)
Temporary ED relapse during pregnancy (%) **Family support (husband)**	16 (67%) 19(79%)
Gestational age at delivery(week)	39 (SD 1.1)
Complications (%)	17 (67%)
Complications in the infants (%)	3 (13%)
Vaginal delivery (%)	19 (79%)
Infant weight(g) **Male infant(%)**	2928 (SD 540) 67%
ED relapse after delivery(%)	12 (50%)
Postnatal depression (%)	12 (50%)

Table 1.
A summary of the characteristics of women who have recovered from EDs and who were interviewed during pregnancy and after childbirth. We made new tables different from previous report [1].

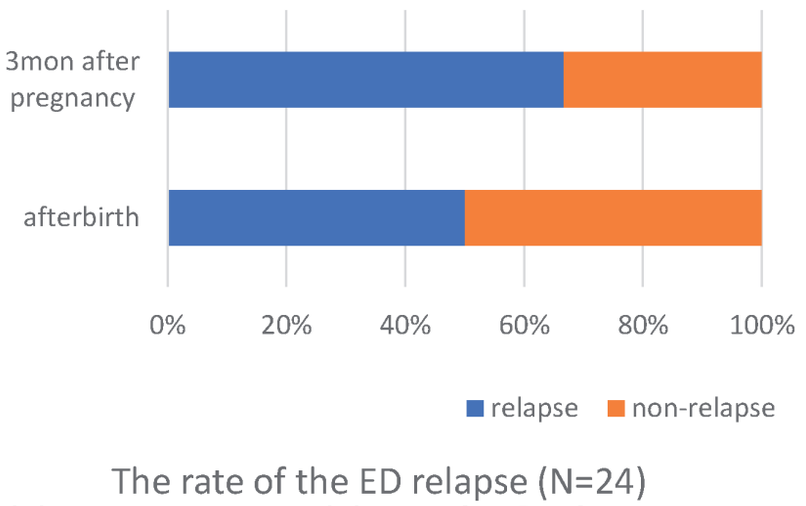

Figure 1.
The rate of the ED relapse: patients with relapse after 3mon of delivery tended to relapse afterbirth.

there was a significant difference between RED group and NRED group. **Figure 2** shows the comparison of these two groups. **Figure 3** shows the infant sex ratio afterbirth between two groups.

No statistical difference could be seen between RED group and NRED group with regard to family support (**Table 2**).

4.3 TRED group and NRED group were compared after childbirth

All NRED group had a vaginal delivery, and most of them gave birth to male infants. However, for the postpnatal depression rate, these two groups were the same. There was a significant difference between age at remission, and age at pregnancy ($P \leq 0.05$); further, difference for ED relapse during pregnancy reached statistical significance ($P \leq 0.05$) between these two groups (**Table 3**).

No significant difference could be seen between RED group and NRED group with respect to postnatal depression and family support.

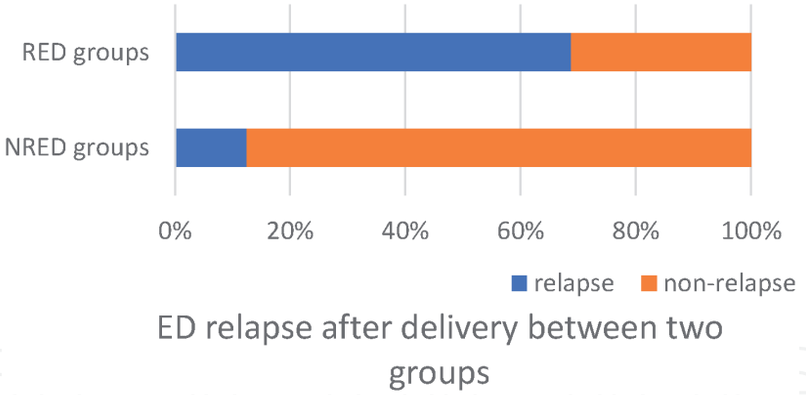

Figure 2.
Showed ED relapse after delivery between two groups. (RED means NRED).

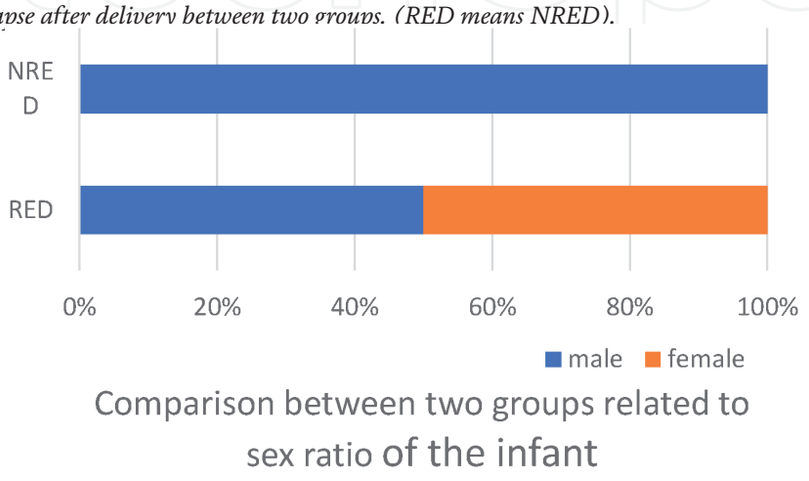

Figure 3.
Showed the infant sex afterbirth between two groups.

	RED group (N = 16)	NRED group (N = 8)	
Age at onset of diagnosis(years)	15.9(SD 1.2)	18.0 (SD 5.4)	NS
Disease duration(years)	9.1(SD 4.0)	10.3(SD7.9)	NS
Age at remission(years)	25.1(SD 4.4)	28.3(SD 6.5)	NS
age at pregnancy (years))	27.1(SD 5.0)	30.1(SD5.8)	NS
Gestational age at delivery(weeks)	38.3(SD1.3)	39 (SD 0.5)	NS
Maternal complications (%)	12(75%)	6 (75%)	NS
Problems in the infants (%)	6 (12.5%)	1 (12.5%)	NS
Vaginal delivery(%)	11(68.8%)	8 (100%)	NS
Infant weight(g)	2763 (SD 392)	3259(SD664)	P < 0.1
Male infant(%)	50%	100%	P < 0.05
Family support husband	13 (81,3%)	6 (75%)	NS
Postnatal depression (%)	10 (62.5%)	2 (25%)	NS
ED relapse after delivery (%)	11 (68.8%)	1 (12.5%)	P < 0.05

Table 2.
Characteristics of women with RED group and NRED group.

4.4 A comparison between patients with postnatal depression and those who did not develop depression afterbirth

The infant body weight was found to be the only difference (**Table 4**).

	TRED group (N = 12)	NRED group (N = 12)	
Age at onset of diagnosis (years)	15.9 (SD 1.4)	17.3 (SD4.4)	NS
Disease duration(years)	7.5 (SD 3.0)	11.5 (SD 6.6)	NS
Age at remission (Years)	23.4 (SD 3.9)	28.8 (SD 5.2)	P < 0.05
Age at pregnancy (years)	24.8 (SD 1.4)	31.5 (SD 4.3)	P < 0.05
Gestational age at delivery (weeks)	38.3 (SD 1.4)	38.8 (SD 0.7)	NS
ED relapse during pregnancy (%)	11 (91.7%)	5 (41.7%)	P < 0.05
Family support husband	11 (91.7%)	8 (66,7%)	NS
Maternal Complications(%)	9 (75%9	9 (75%)	NS
Problems in the infant(%)	2 (12.5%)	1 (12.5%)	NS
Vaginal delivery(%)	7 (58.3%)	12 (100%)	P < 0.1
Infant weight(g)	2813 (SD 446)	3044 (SD 618)	NS
Postnatal depression	6 (50%)	6 (50%)	NS

Table 3.
Comparison between TRED group and NRED group after childbirth.

	Depression group(N = 12)	Non-depression group(N = 12)	
Age at onset of diagnosis(years)	15.8(SD 0.8)	17.4 (SD 4.5)	NS
Disease duration(years)	10.4(SD 3.3)	8.6 (SD 7.6)	NS
Age at remission(years)	26.3(SD 3.4)	26.0 (SD 6.9)	NS
Age at pregnancy(years)	28.3 (SD 3.4)	27.9 (SD 6.8)	NS
Gestational age at delivery (week)	38.4 (SD 1.3)	38.8 (SD 0.9)	NS
Temporary ED relapse during pregnancy (%)	10 (83.3%)	6 (50%)	NS
Family support husband	9 (75%)	10 (83.3%)	
Maternal complications (%)	7 (58.3%)	9 (75%)	NS
Problems in the infant (%)	2 (16.7%)	1 (8.3%)	NS
Vaginal delivery(%)	11 (91.7%)	8 (66.7%)	NS
Infant weight (g)	2669 (SD 406)	3188 (SD 544)	P < 0.1
ED relapse after delivery (%)	6 (50%)	6 (50%)	NS

Table 4.
A comparison between postnatal depression and patients who did not develop depression following childbirth.

4.5 Complications among mothers

Our research exhibited a variety of complications such as diabetes mellitus in 5 patients, anemia in 3, threatened miscarriage in 2, kidney stones in 2, nephrosis in 1, eclampsia in1, hypertension in 1, placenta previa in 1, miscarriage in 1, cesarean sections in 5, Although the sample size was small, We detected various complications.

4.6 Main summary of the results

4.6.1 The relapse rate of EDs during pregnancy

67% of the patients relapsed after delivery and of them were belong to RED group.

4.6.2 Relapse of EDs afterbirth

50% of the participants relapsed.

4.6.3 What kind of the participants experienced relapse of EDs afterbirth

The group relapsed during pregnancy (TRED group) tended to be relapsed afterbirth.

4.6.4 Infants sex

50%of the infants in the TRED group had male infants, while 100% of the infants in the NRED group were male.

4.6.5 Postnatal depression

50% of the participants had postnatal depression.

5. Discussions

We hypothesized that Ex-ED patients were vulnerable to relapse ED during body transition period such as pregnancy and giving birth. In addition, after birth, they tended to be anxious and depressed with their body image and weight, leading to have possibility to suffer from postnatal depression. Our results may supported our hypothesis.

Further we anticipated that family support played an important role in preventing relapse and postnatal depression. However, our result was not supported by our anticipation.

As per the literature, partners attitudes to EDs could help prevent ED relapse [15] and postpartum depression [16].

In our samples, all the supporters were partners and not mothers. Ikuno [17] reported there was problematic relationship between mother and daughter; daughter used her thinness as a weapon to draw her mother's attention, and involved her mother in her frustration. This is the problematic relationship of mother and daughter, that had not overcomed for a long time, as a result they hate each other. Owing to this problematic relation, mother might not support her daughter and daughter do not want to be supported by her mother.

We believed that the supporters for patients with EDs are very sensitive and some cases their behavior might worsen the symptoms of ED.

We investigated pregnant women recovered from EDs completely. Keel et al. [18] showed that among the patients who recovered from EDs, relapse rate was 36% in AN patients, and 35% in BN patients. Compared to these results, our rate of TRED group was 67%. Thus, Pregnancy was a crucial event for relapse for patients with ED. Our data showed that the TRED group improved within the first 3mon of pregnancy.

We found the in spite of the relapse, mothers and infants complications were not different compared to NRED group.

Nevertheless, the prevalence of postnatal depression was lower and the infant body weight was greater in the NRED group. Following childbirth, we found that the rate of postnatal depression and complications were similar in the RED and the NRED group. Further, we showed that the infants belonging to the postnatal depression group had a lower body weight than those in the non-depression group.

Angela [19] showed that patients with ex-EDs commonly experienced relapse;in AN 36%, in BN 35%, the figure was similar to that reported by Keel et at al [18]. Hetman et al. [20] showed that ED patients experienced relapse when they go to start to school or to go to college, or to start a new job, to be pregnant, and to have a baby.

Our data (67% of the patients relapsed during pregnancy and 50% of the patients relapsed ED after childbirth.) showed that pregnancy and childbirth represented the transition period for EDs, and postnatal term. Patients had been treated from the time of diagnosis up until the time of giving birth and postnatal period. We treated them twice a month, and we taught them how to coping with their eating attitudes and negative feelings.

A study out of Kelty Mental Health Center in British Columbia, Canada. [21] suggested that ED relapse could be averted by encouraging a support system for EDs, such as teaching them how to eat healthier,and control their unstable feelings. The Authority also taught EDs how to cope with their negative influences; to identify disease triggers, to create personal coping strategies, and to eat meals regularly. Our attitudes to them was that we encouraged them continuously to change their eating attitudes promoting self-control and encouraging the development of healthy relationships with the others, particularly their spouses and close family members. Our strategy may be equivalent to that of Kelty. Therefore, that we should followed -up the ED patients for a long term was the one of the strategies to prevent ED relapse. We think this is also appropriate even for pregnant women with EDs.

Hetman et al. [20] stated that pregnancy was risk factor for ED relapse. Especially AN patients wanted to be thinner seriously, leading to reducing their food, tended have a higher risk of relapse even when they are pregnant, regardless of their desire to be pregnant. They did not want to eat an adequate amount of food. In a similar way, Mancini [22] stated that it was usual that even pregnant healthy women had body image dissatisfaction. Our results suggested that having a prior history of an EDs with body image unsatisfaction was serious risk factors for relapsing for EDs.

Our patients had many complications during gestation. In EKeus et al. [23], it was reported that BN women experienced an increased risk of miscarriage. Similarly, our findings demonstrated that a woman who had a history of BN experienced a miscarriage. In Koubaa et al. [24], they reported that the fetus among AN mothers grew less efficiently in the intrauterine environment, leading to lower body weight infants. The Japanese Nikkei Health [25] describes that an average infants' body weight in Japan, where a male infants' average weight should be 2980 g and a female infants' weight should be 2910 g. Our findings showed an average body weight of 2928 ± 540 g infants, which was comparable to Nikkei Health Report.

However, our RED group regained during the first 3 months of gestation. The mechanism for this change remains unclear. The body weight of infants in the RED group was lower than that infants weight in the NRED group. Nevertheless, the final body weight of infants measured in this study was similar to the average body infant weight in Japan. Thus, the first 3 mon of pregnancy may not be important for the infant growth. Middle ages patients, such as hypertension, the presence of coronary heart disease, and non- insulin-dependent diabetes mellitus can be caused by intrauterine growth restriction, leading to lower birth weight [26]. Thus, low body

weight infants should be followed -up for a long duration, which can be important to prove for Barker's hypothesis. Our data showed that all subjects in the NRED group gave birth to male infants. However, the underlying reason remains still unclear.

Franco et al. [27] showed that most women with active EDs had normal progress during gestation period, and the newborn babies were healthy. Our results are in line with those reported by Franco et al.; Further, the patients in our research did not have active EDs; thus their babies were more likely to be normal weight than those from mothers with active EDs.

Bennet et al. [28] demonstrated that in ED patients, half developed postnatal depression and the rate of postnatal depression among healthy women was about 13%. Our results agree with this report. Nasreen et al. also [29] reported that low birth weight infants was strongly related to postnatal depression. Moreover, our results demonstrated that following birth infants in whose mothers' developed depression, had a decreased infant body weight, when compared to those whose mothers did not develop depression. Our results supported Bennet and Narsreen.

Because of the small sample size, we did not reached the result that BN patients had a higher chance for developing postnatal depression. Nevertheless, since about half of BN patients developed postnatal depression, BN has possibility to increase the risk of having postnatal depression. Moreover, within the AN patients group, 75% of the patients developed postnatal depression. However, the underlying reason remains unclear. Mazzeo et al. [30] demonstrated that patients with a history of EDs were at increased risk of relapse during gestation period, which lead to an increased incidence of postnatal depression and anxiety. Chan et al. [31] demonstrated that a higher level of disordered eating during pregnancy was related to an increased incidence of postnatal depression. However, in contrast, our findings did not demonstrate a higher rate of postnatal depression in RED group compared to the NRED group. Therefore, when considering pregnant women who have a history of ED, there may be a higher risk of postnatal depression and long-term follow-up should be considered. In the current study, we demonstrate that approximately half of the patients with pre-existing EDs relapsed within 1 y of delivery. Morgan et al. [32] reported that among mothers with pre-existing EDs 66% of experienced binging and vomiting after childbirth. However, we do not have detect the patients' types precisely about the type of EDs relapse experienced after childbirth. Thus, we are not able to confirm the findings of Morgan. Patients were seen in our outpatient clinic every 2 wk. and we counseled them about the management of their stress coping and anxiety etc., that might helped EDs to prevent relapse.

There are some limitations of this study. Sample size was smaller. An increase in the sample size would have strengthened the statistical power of our study and made us to compare between groups with EDs. Our findings supported our hypothesis that suggested that women with pre-existing EDs were vulnerable to relapse during pregnancy and after childbirth as well as suffering from postnatal depression. Another limitation was that we included only women with AN and BN. Our samples were limited to the following two groups: women with AN and women with BN. As such other subtypes of EDs such as binge eating disorder etc. were not included, and should be examined to verify our results. The most important limitation in our current study was the lack of a control that included healthy women, who did not have any EDs.

In order to anticipate the risk of postnatal depression, we need to consider various questions, including the patients' social support system, and their feeling of becoming a mother and how they perceive their body shape and weight, because Chan et al. [31] demonstrated a relationship between postnatal anxiety, irritability, and depressive symptoms for 6 mon afterbirth had a serious relationship with body dissatisfaction, leading to postnatal depression.

6. Conclusions

The findings from our long-term follow-up for EDs as well as our previous research [1] suggest that despite our small sample size, 67% of the patients relapse after childbirth, and they relapsed within the 3mon of the pregnancy. The rate of the postnatal depression was higher compared to healthy women. There was no relation between ED patients and their husband with regard to family support. Thus the long-term follow-up for the patients with EDs were very important.

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Conflict of interest

The authors declare no conflict of interest.

Ethics approval and consent to participate

Makino Clinic Ethics Committee approved this study (No. 002).

Consent for publications

The patients provided written informed consent to participate in this study.

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

List of abbreviations

AN	Anorexia nervosa
BN	Bulimia nervosa
DM	Diabetes Mellitus
EAT	Eating Attitudes Test
ED	Eating disorders
EPDS	Edinburgh postnatal Depression Scale

Author details

Mariko Makino[1*], Mitsuo Yasushi[2] and Masahiro Hashizume[1]

1 Toho-University, School of Psychosomatic Medicine, 1-16-6 Omorinishi, Ota-ku, Tokyo, Japan

2 Faculty of Science and Engineering, Chuo University, Tokyo, Japan

*Address all correspondence to: makimakimakimariko@gmail.com

References

[1] Mariko M, MitsuoY, Sueharu Tsutsui: The risk of eating disorder relapse during pregnancy and after delivery and postpartum depression among women recovered from eating disorders. BMC Pregnancy and Childbirth 2020;20(323) https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-020-03006-7#main-cntent

[2] American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5. 5th ed. Arlington, VA: American Psychiatric Association;2013

[3] Strober M: Stressful life events associated with bulimia and anorexia nervosa. International Journal of Eating Disorders.1984;3:1-6.

[4] Claydon EA, Davidov DM, Zullg KJ, et al: Waking up everyday in a body that is not yours: a qualitative research inquiry into the intersection between eating disorders and pregnancy. BMC Pregnancy and Childbirth.2018;18:463.

[5] Nakai Y, Kazuo N, Shuichi N: Outcomes of eating disorders in Japan. Seishin Igaku.2004;46:481-486

[6] Watson HJ, Zerwas S, Torgersen L et al: Maternal eating disorders and perinatal outcomes: A three-generation study in the Norwegian Mother and Child Cohort Study. Journal of Abnormal Psychology.2017;126:552-564

[7] Levallius J, Clinton D, Backstrom M et al:Who do you think you are? Personality in eating disorder patients. Journal of Eating Disorders.2015;3:3

[8] Bardone-Cone AM, Hunt RA, Watson HJ: An overview of conceptualization of eating disorder recovery, recent findings, and future directions. Current Psychiatry Report. 2018;20:79

[9] Zerwas S, Lund BC, Von Holle et al: Factors associated with recovery from anorexia nervosa. Journal of Psychiatric Research. 2013; 47: 972-979

[10] Eddy KT, Tabri N, Thomas JJ et al: Recovery from anorexia nervosa and bulimia nervosa at 22-year follow-up. Journal of Clinical Psychiatry. 2017;78:184-189

[11] Tachikawa H: What is remission in eating disorders?. Seishinka. 2009;15:447-452

[12] Ujiie T, Kono M: Eating attitudes test in Japan. Japanese Journal of Psychiatry and Nuurology. 1994;48:557-565

[13] Okano T: Validation and reliability of a Japanese version of the EPDS. Psychiatric diagnosis and clinical evaluation. 1996;7:525-533

[14] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders:DSM-IVth ed.Arlington,VA:American Psychiatric Association;1994

[15] Koenig.KR: 6ways Eating disorders Can Affect Your(Romantic) Relationships.https://www.recoveryearriors.com/eating-disorders-can-affect-romantic-relationships.2016 August 18

[16] Pregnancy -related depression linked to eating disorders and abuse histories. http://www.med.unc.edu/www/newsarchive/2011/june/pregnancy-related-depression-linked-to-eating-disorders-and-abuse-histories

[17] Ikuno T:Eating disorders and Mother-Daughter relationships. jyoseigaku hyoron koubejyogakuin daigaku 2015;1-22

[18] Keel PK, Dorer DJ, Franco DL et al: Post -remission predictors of

relapse in women with eating disorders. American Journal of Psychiatry. 2005;162(12):2263-2268

[19] Angela D: Eating disorder relapse is common, A therapist's perspective. http://www. Eatingrecoverycenter. com/blog/November-2019/ eating-disorder-relapse.

[20] Hetman I, Klomek AB, Goldzweig G et al: Percentage from target weight predicts re-hospitalization in adolescent anorexia nervosa. Israel Journal of Psychiatry. 2017;54:28-34

[21] Provincial Health Services Authority, Kelty Mental Health(eating disorders)http://www. keltyeatingdisorders.ca/recovery/ relapse-prevention/

[22] Mancini K: Body image, eating attitudes and breastfeeding intention: implications for mental health and maternal child nurses. Issues Mental health Nursing.2017;38:750-7552

[23] EKeus C, Lindberg L, Lindberg F et al: A Birth outcomes and pregnancy complications in women with a history of anorexia nervosa. British Journal of Obstetrics and Gynecology.2006;105:255-260

[24] Koubaa S, Hallstrom T, Lindholm C et al: Pregnancy and neonatal outcomes in women with eating disorders. Obstetrics and Gynecology.2005;105:255-260

[25] Japanese Nikkei Health. http:// www.style.nikkei.com/article/ DGXMZO77271820Z10C14A9000000/ Accessed 12 OCT 2014

[26] Barker DJ: Fetal origins of coronary heart disease. British Medical Journal.1995; 311:171-174

[27] Franco DL, Blais MA, Becker AE et al: Pregnancy complications and neonatal outcomes in women with eating disorders. American Journal of Psychiatry.2001;158:1461-1466

[28] Bennet HA, Einarson A, Taddio A et al: Prevalence of depression during pregnancy : systematic review. Obstetrics and Gynecology.2004;103:698-709

[29] Nasreen HE, Kabir ZN, Forsell Y et al: Low birth weight offspring of women with depressive and anxiety symptoms during pregnancy:results from a population based study in Bangladesh. BMC Public Health. 2010;10:515

[30] Mazzeo SE, Slof'Op't Landt MC, Jones I et al: Associations among postpartum depression, eating disorders, and perfectionism in a population -based sample of adult women. International Journal of Eating Disorders.2006;39:202-211

[31] Chan CY, Lee AM, Koh YW et al: Course, risk factors, and adverse outcomes of disordered eating in pregnancy. International Journal of Eating Disorders. 2019;52:652-658

[32] Morgan JF,Lacey JH,Sedgwick PM: Impact of pregnancy on bulimia nervosa. British Journal of Psychiatry.1999,174.135-140