BRIEF REPORT

REVISED Influence of delivery mode on maternal mental status one month after delivery at a perinatal center in Japan: A cross-sectional study [version 2; peer review: 1 approved, 1 approved with reservations]

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Abstract

Background: Maternal mental status has been thought to be affected by the delivery modes. We examined the influence of delivery modes on the mental status of women who delivered at our institute in Japan.

Methods: Data were collected from the medical charts of 645 primiparous women without a history of mental disorders who delivered singleton babies and underwent a 1-month postpartum check-up at our institute from September 2018 to June 2019. The maternal mental status was examined based on the scores of the Edinburgh Postnatal Depression Scale (EPDS) and the Mother-Infant Bonding Scale (MIBS).

Results: The rate of high scores of the EPDS and the MIBS in women choosing elective cesarean section were higher than in women with vaginal delivery and emergency cesarean section.

Conclusion: Mental health care may be necessary for women choosing elective cesarean section.

Keywords

maternal mental status, elective cesarean section, birth-review

Open Peer Review

Approval Status

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version 3 (revision) 10 Aug 2020		 view
version 2 (revision) 11 Jun 2020	 view 	 view
version 1 15 Oct 2019	 view	

1. **Tuğba Kinay**, University of Health Sciences, Ankara, Turkey

2. **Jacopo Lenzi** , Alma Mater Studiorum - University di Bologna, Bologna, Italy

Any reports and responses or comments on the article can be found at the end of the article.

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Author roles: Suzuki S: Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing

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REVISED Amendments from Version 1

To examine our speculation, a large prospective study with birth-review is needed. We have re-written the Conclusion to include this sentence.

Any further responses from the reviewers can be found at the end of the article

Introduction

Maternal mental status has been thought to be affected by the delivery modes because childbirth is an important event for both the mother and child, and it influences early mother-infant interaction^{1,2}. In this study, we examined the influence of delivery modes on the mental status of women who delivered at our institute in Japan.

Methods

Ethical issues

The protocol for this study was approved by the Ethics Committee of the Japanese Red Cross Katsushika Maternity Hospital. In addition, informed consent concerning analysis from a retrospective database was obtained from all subjects. In our institute, cesarean section is not performed without medical indication because cesarean section on maternal request for pain relief has not been generally recognized in Japan.

Data collection

Data were collected from the medical charts of 645 primiparous women without a history of mental disorders who delivered singleton babies and underwent a 1-month postpartum check-up at our institute from September 2018 to June 2019. Of the 645 primiparous women, 389 women (60.3%) had vaginal deliveries, 80 (12.4%) had elective cesarean deliveries, and 176 (27.3%) had emergent cesarean deliveries. In this study, demographic data included maternal age. The maternal mental status was examined based on the scores of the Edinburgh Postnatal Depression Scale (EPDS) and the Mother-Infant Bonding Scale (MIBS), and the time required for psychiatric counseling by our midwives. Women with the EPDS ≥ 9 points, those with the MIBS ≥ 3 points, and the time required for psychiatric counseling ≥ 25 minutes were diagnosed with mental problems.

Data analysis

Data are presented as mean $\pm$ SD or number (%). SPSS Statistics software version 20 (IBM Corp., Armonk, NY, USA) was used for statistical analyses. For statistical analysis, the χ^2 test for categorical variables and the Student's *t*-test for continuous variables were used. Differences with $p < 0.05$ were considered significant.

Results

Table 1 shows the clinical description of primiparous women and the results of mental problems. The rates of high scores of the EPDS and the MIBS were higher in the emergency cesarean group than vaginal delivery group; in addition, the rate of high scores of the EPDS and the MIBS and a long time

Table 1. Clinical description and the results of mental problems in nulliparous women who delivered singleton babies at one month after delivery.

Variable	Vaginal delivery	Elective cesarean delivery	Emergency cesarean delivery
Number	387	80	176
EPDS			
Average (points)	5.1 $\pm$ 4.0	5.8 $\pm$ 4.6*	5.4 $\pm$ 3.5
≥ 9 points	23 (6.0)	22 (27.5)*#	21 (11.9)*
MIBS			
Average (points)	1.8 $\pm$ 1.8	2.7 $\pm$ 2.9*	2.4 $\pm$ 2.4*
≥ 3 points	33 (8.5)	21 (26.3)*	31 (17.6)*
Interview time			
Average (minutes)	15.4 $\pm$ 9.0	18.5 $\pm$ 8.0*	14.0 $\pm$ 6.2
≥ 25 minutes	31 (8.0)	12 (15.0)*#	8 (4.5)

Data are presented as mean $\pm$ SD or number (%).

EPDS, Edinburgh Postnatal Depression Scale; MIBS, Mother-Infant Bonding Scale.

**P* vs. vaginal delivery group.

#*P* vs. vaginal and emergency cesarean delivery groups.

for psychiatric counseling in women choosing elective cesarean section were higher than in women with vaginal delivery and emergency cesarean section, as shown in Table 1.

Discussion

This may be the first report to indicating that women received elective cesarean section are more prone to have mental problems. Although we predicted that the highest frequency of mental problems would be in the emergent cesarean delivery group, the women choosing elective cesarean delivery actually had the most mental problems. The reason for the results is not clear; however, based on the records of psychiatric counseling, it may be because there was no birth-plan or birth-review for women scheduled for elective cesarean delivery. In our institute, a birth-plan has been carried out for all pregnant women scheduled for vaginal delivery, and a birth-review that takes a long time during hospitalization has been performed especially for mothers undergoing emergency caesarean section in order to recover from the trauma of the sudden departure from normal labor³. This is because a birth-review is one of the concrete measures to learn about the 'bruising' of labor and promptly affirm the experience of delivery^{3,4}. A mother's thought during birth-review about the experience of childbirth has been suggested to help express feelings of embarrassment and provide an opportunity to reconstruct the facts. On the other hand, pregnant woman scheduled to undergo elective cesarean section are given an explanation and birth-review of cesarean section solely from a surgical perspective. The absence of an adequate birth-plan or birth-review may lead to mental problems in postpartum women who receive elective cesarean section. Therefore, a fulfilling birth-plan and birth-

review may also be necessary for women choosing elective cesarean section.

We understand the small sample size for statistical analyses as one of serious limitations in this study. To examine our speculation, a large prospective study with birth-review will be needed.

Data availability

Underlying data

Figshare: delivery mode and maternal mental status. <https://doi.org/10.6084/m9.figshare.9956690.v1>⁵.

This project contains data on the delivery method, EPDS and MIBS scores and counselling time for each participant.

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

Acknowledgements

The author wishes to thank all patients for their collaboration.

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Open Peer Review

Current Peer Review Status:

Version 2

Reviewer Report 06 August 2020

<https://doi.org/10.5256/f1000research.27256.r68783>

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Jacopo Lenzi

Department of Biomedical and Neuromotor Sciences, Alma Mater Studiorum - University di Bologna, Bologna, Italy

The work by Shunji Suzuki analyzes the association between method of delivery and maternal mental status after one month. He found that elective C-sections are associated with higher levels of mental distress, and argued that this result might have to do with the absence of birth-plans and birth-reviews for women undergoing elective CS. Here are my comments:

1. I would not talk about "influence", which implies causality. Please consider using "association" or "relationship" instead.
2. Are you sure that your sample size is 645? According to the data presented in Table 1 and uploaded to Figshare, the women enrolled in the study are 643.
3. No justification is provided for the cut-offs presented at the end of the Data Collection section. For instance, you used an EPDS cut-off of 9, but more commonly adopted thresholds are 10 (minor depression) and 13 (major depression) (Fellmeth G, et al. *J Affect Disord* 2019;251:8-14). Please provide adequate references or update your cut-offs.
4. Table 1 and the data set you shared do not match. After analyzing the data uploaded to Figshare, I found very different results (see below). Please check consistency and review the entire Results section, if necessary. Please also consider adding a column for the entire sample, as I did here. Statistical significance should also be described differently in the table footnotes.

Table 1. One-month clinical evaluation for women who delivered a singleton baby between September 2018 and June 2019, overall and by method of delivery.

Variable \	All (n = 643) \	Vaginal delivery (n = 387) \	Elective CS (n = 80) \	Urgent CS (n = 176)
EPDS score				
Mean ± SD \	3.7 ± 3.4 \	3.2 ± 2.7 \	5.5 ± 4.9*# \	4.0 ± 3.8*
≥9,				

n (%) \ 66 (10.3) \ 23 (5.9) \ 22 (27.5)*# \ 21 (11.9)* |
 MIBS score |
 Mean $\pm$ SD \ 1.3 $\pm$ 2.1 \ 1.1 $\pm$ 2.1 \ 1.9 $\pm$ 2.4*# \ 1.3 $\pm$ 2.1 |
 ≥ 3 , n (%) \ 86 (13.4) \ 33 (8.5) \ 22 (27.5)*# \ 31 (17.6)* |
 Interview time (minutes) |
 Mean $\pm$ SD \ 12.8 $\pm$ 7.3 \ 12.9 $\pm$ 7.8 \ 14.1 $\pm$ 8.3 \ 11.8 $\pm$ 5.3 |
 ≥ 25 , n (%) \ 52 (8.1) \ 32 (8.3) \ 12 (15.0)# \ 8 (4.5) |

CS, cesarean section; *EPDS*, Edinburgh Postnatal Depression Scale; *MIBS*, Mother-Infant Bonding Scale.

* $p < 0.05$ (elective CS vs. vaginal delivery).

$p < 0.05$ (elective CS vs. vaginal delivery + urgent CS).

5. What about maternal age? Was it similar across the three groups under study? If so, the association between method of delivery and outcomes should be adjusted for age.
6. What about the external validity (generalizability) of the study? The Katsushika Maternity Hospital does not have any "birth-path" for women undergoing elective C-section—is this a common or uncommon situation?

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Medical statistics, Epidemiology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 16 June 2020

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Tuğba Kinay

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I reviewed the revised manuscript. The author revised the manuscript based on my comment. I think that the paper is suitable for indexing in its current form.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Obstetrics and gynecology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 08 June 2020

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Tuğba Kinay

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Thank you for the opportunity to evaluate this report. The paper is about the effect of delivery mode on the postpartum mental status of women. The results of the study indicate that the women who underwent elective cesarean delivery had higher scores of the EPDS and MIBS than women with vaginal delivery and emergent cesarean delivery. I have the following comment: In discussion section, the author state that – "We understand the small sample size for statistical analyses as one of serious limitations in this study. However, a fulfilling birth-plan and birth-review may also be necessary for women choosing elective cesarean section." I don't think that the current study based on its methodology can support that statement .The conclusion paragraph including main outcomes of the study should be rewritten.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: obstetrics and gynecology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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