



Estradiol levels in postpartum blues incidences at Pertiwi Maternal and Child Hospitals in Makassar[☆]



Musniati^a, Saidah Syamsuddin^{b,*}, Muhammad Tamar^c

^a Midwifery Study Program, Graduate School, Hasanuddin University, Makassar, Indonesia

^b Department of Psychiatric, Medicine Faculty, Hasanuddin University, Makassar, Indonesia

^c Department of Psychology, Medicine Faculty, Hasanuddin University, Makassar, Indonesia

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KEYWORDS

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Abstract

Objective: This study aims to determine estradiol levels in mothers who experience postpartum blues.

Methods: It was a cross-sectional study conducted in Pertiwi Maternal and Child Hospital Makassar. The population was all mothers who had normal postpartum births on the third day from January to March 2018, and samples were 31 selected accidentally selected. Postpartum blues data was obtained with the Edinburgh Postnatal Depression Scale (EPDS) questionnaire and secondary data obtained from maternal medical records in the delivery room and nursing staff at the hospital. Estradiol levels examined using the enzyme-linked immunosorbent assay (ELISA) technique. Analysis of the data in this study Mann Whitney and data were performed using frequency and mean.

Results: Estradiol levels between mothers who experienced and those who did not experience postpartum blues were different significantly ($p=0.024$, $p<0.05$). Mothers with postpartum blues have estradiol levels of 729.92 pg/ml; this level is 293.56 pg/ml lower than those who do not experience the postpartum blues, which is 1023.48 pg/ml. In the group with postpartum blues, the range of postpartum mothers appeared to be at levels of 58.54.

Conclusion: Levels of hormone estradiol are lower in mothers who have postpartum blues. It is needed individual attention to postpartum mothers so that those detected with very low estradiol levels can get treatment and prevention as soon as possible.

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* Corresponding author.

E-mail address: saidahsyamsuddin@pasca.unhas.ac.id (S. Syamsuddin).

Introduction

The postpartum blues is a mild disorder that often occurs in the first week, the first day until the tenth day after delivery. It occurs often on the third or fourth day postpartum and peaks between the fifth and fourteenth days of postpartum.¹

Some hypotheses link the occurrence of postpartum blues and disorders of the neuroendocrine system. The previous study that has examined the relationship of gestational reproductive hormones to maternal behavior after childbirth by examining estradiol levels is then associated with maternal behavior and attachment to the baby.² Estradiol levels are neuroendocrine parameters of the postpartum blues. In pregnancy, the process of increasing estrogen hormones (estradiol, estriol, and estrone) is mostly from placental production. Declining in estradiol levels theoretically contributes to the incidence of psychological disorders, i.e., mood changes to depression.³

Mild symptoms of mood disorders are indicated by symptoms called postpartum blues or postpartum blues. In its development, syndrome partum blues or postpartum blues can develop into a more severe period and fall to postpartum depression or postpartum psychosis. This situation is awful for both mother and baby's development.⁴⁻⁷ Postpartum depression can lead to the inability of the mother to care for herself and her baby and in some conditions, can be life-threatening to the mother and baby. Mother with postpartum blues unable to respond positively to the baby, unable to care for their babies optimally and resulting in poor health and hygiene conditions, mothers are not eager to breastfeed their babies, so that implicate to the growth and development.^{8,9}

Postpartum depression is usually underdiagnoses and requires an initial indicator, low estradiol levels in postpartum blues can be the initial indicator postpartum mothers to get attention. Many publications and study are on estradiol levels in postpartum depression, but the estradiol levels in the postpartum blues are rarely studied and published. This study aims to determine estradiol levels in mothers who experience postpartum blues.

Methods

Study location and design

This study was conducted in Pertiwi Maternal and Child Hospital Makassar. The design used was a comparative analysis with a cross-sectional study design.

Population and samples

The population in this study were all mothers who had normal postpartum births on the third day from January to March 2018. The number of samples used in this study was 31 accidentally selected samples that met the inclusion criteria, i.e., mothers 3 days postpartum and willing to be a respondent, normal delivery, no depression treatment history, APGAR scores ≥ 8 , no major congenital abnormalities both mother and babies.

Data and analysis

Postpartum blues data was obtained directly through, Edinburgh Postnatal Depression Scale (EPDS) questionnaire and secondary data about characteristics obtained from maternal medical records in the delivery room and nursing staff at the hospital. Estradiol levels examined using the enzyme-linked immunosorbent assay (ELISA) technique. Analysis of the data in this study Mann Whitney and data were performed using frequency and mean.

Results

Characteristics

All respondents were 31 people, 22 respondents (70.97%) experienced postpartum blues, and only 9 respondents (29.03%). Risk factors that have a high frequency of having postpartum blues were those over the age of 25 years, i.e., 18 people (58.06%), housewife work (18 people, 58.06%), household income $<2,500,000$ per month (13, 41.94%) (Table 1).

Data shows that despite having high school education and academies still suffering from postpartum blues (17 people, 54.84%), primipara and multipara parity was not different, primipara with postpartum blues, i.e., 10 people (32.26%) and multiparas 12 people (38.71%). Mothers who had planned their pregnancies also had the majority of postpartum blues, which was 18 people (58.06%) and even without a history of depression also had postpartum blues, which was 17 people (54.84%) as well as those who had social support, which is 18 people (58.06%) (Table 1).

Estradiol levels between mothers who experienced and those who did not experience postpartum blues were different significantly ($p=0.024$, $p<0.05$). Mothers with postpartum blues have estradiol levels of 729.92 pg/ml; this level is 293.56 pg/ml lower than those who do not experience the postpartum blues, which is 1023.48 pg/ml (Table 2).

Discussion

Characteristics

There were 70.97% experienced postpartum blues, and only 29.03% did not experience this syndrome. Risk factors that have a high frequency of having postpartum blues were those over the age of 25 years, housewife, and household income $<2,500,000$ rupiahs per month.

Data shows that despite having high school education and academies, planned their pregnancy, had social support, had no depression history still suffering from postpartum blues. There was no difference between multipara and primipara, and frequency is the same for those suffering from postpartum blues.

Since the beginning of the study of the incidence of postpartum blues, the frequency of incidence has been high around 70–80% and is considered normal because of hormonal changes.¹⁰ Mothers who plan their children tend to want certain gender or certain expectations, so they tend

Table 1 Characteristics of respondents.

Characteristics	Syndrome baby blues			
	Yes (n = 22)		No (n = 9)	
	n	%	n	%
<i>Age (years)</i>	11	52.4	10	47.6
≤25	4	12.90	3	9.68
>25	18	58.06	6	19.35
<i>Education</i>				
Senior high school, college	17	54.84	7	22.58
Primary, junior high school	5	16.13	2	6.45
<i>Work</i>				
Private employees, honorary teachers, civil servants	4	12.9	4	12.9
Housewives	18	58.06	5	16.13
<i>Income</i>				
Enough (≥2,500,000 IDR)	9	29.03	6	19.35
Low (<2,500,000 IDR)	13	41.94	3	9.68
<i>Parity</i>				
Primipara	10	32.26	7	22.58
Multipara	12	38.71	2	6.45
<i>Planning for pregnancy</i>				
Planned	18	69.2	8	25.81
Unplanned	4	12.9	1	3.23
<i>Depression history</i>				
Yes	5	16.13	1	3.23
No	17	54.84	8	25.81
<i>Premenstrual syndrome history</i>				
Yes	11	35.48	3	9.68
No	11	35.48	6	19.35
<i>Social support</i>				
Yes	18	58.06	9	29.03
No	4	12.90	0	0.0

Table 2 Comparison of estradiol level.

Postpartum blues	Range Estradiol level (pg/ml)	Estradiol level (pg/ml)		Mean difference	p-Value
		Mean ± SD			
Yes	58.54–3200	729.92 ± 85.498		293.56	0.024 ^a
No	197.24–3200	1023.48 ± 86.543			

^a Mann-Whitney-U test.

to increase anxiety or change their mood after, as well as non-working mothers and inadequate economic conditions, is a cause for anxiety about financing after delivery.^{4,11} Previous studies have always suggested that social support and history of depression are factors that play a role in the postpartum disorder, but in this study, it seems that the risk factors are more economic conditions and lack of clarity in income.

Estradiol level

Mothers with postpartum blues have estradiol 293.56 pg/ml lower than those who do not experience the postpartum blues. In the group with postpartum blues, the range of postpartum mothers appeared to be at levels of 58.54 pg/ml. The difference in mean estradiol hormone, although statistically significant but is still clinically considered reasonable,

but personally, there are postpartum mothers with estradiol levels that need to be watched out for because they have reached a deficient level and if they do not overcome the disorder, it can lead to postpartum depression or postpartum psychosis.

A study shows that those who experience postpartum depression estradiol hormone levels can reach an average of 79.8 pmol/l and can be treated immediately if given the hormone estradiol.^{12,13} Estradiol concentration at the end of pregnancy and low labor is closely related to the behavior of the mother after giving birth to her child and the continuity or attachment of the mother to her baby.¹⁴⁻¹⁶

Estrogen can affect both physiological and behavioral functions. The effect of estrogen is mediated by two different estrogens (ER) receptors, estrogen alpha receptors (ER α) and estrogen beta receptors (ER β). ER α and ER β control stress reactions and regulate the neuropeptide neurotransmitter system. Estrogen also modulates related functions such as inflammatory pain processes, restless behavior, depressive, and cognitive functions.¹⁷

The biologically active form of estrogens in the form of estradiol and estriol increases during pregnancy each by 100 times and 1000-fold, at the time of labor which ends with placental expulsion, estrogen levels drop sharply to the lowest level or rise to the fifth day postpartum. Low estradiol levels theoretically contribute to the occurrence of psychological disorders in the form of mood changes to depression.¹⁸

Further study is needed cohort whether postpartum mothers who have very low estradiol levels eventually tend to experience postpartum psychosis or postpartum depression and it is also indispensable whether interventions with the administration of estradiol or counseling can help prevent this.

Conclusion

Levels of hormone estradiol are lower in mothers who have postpartum blues. It is needed individual attention to postpartum mothers so that those detected with very low estradiol levels can get treatment and prevention as soon as possible.

Conflict of interest

The authors declare no conflict of interest.

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