Research Article

Relationship of Serum Cortisol Levels with *Postpartum Blues* on Dystocia Labor

Hubungan Kadar Kortisol Serum dengan Kejadian Postpartum Blues pada Persalinan Distosia

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Abstract

Objective : To determine the relationship of elevated serum cortisol levels in the mother with dystocia labour

Methods : This was a prospective study, with mother who had dystocia labour as case group and mother with normal delivery as control group at RSUP Prof.DR.RD Kandou, and affiliation hospitals from October 2016 until March 2017. Data were analysed with SPSS version 2.0 to see the significance level.

Results : from 32 cases, 16 cases with dysocystia labour and 16 cases with normal delivery. Of all cases with abnormal postpartum serum cortisol levels, the most were housewives with 14 cases (70%), based on educational level, most of whom below bachelor degree were 18 cases (90%). While cases with EPDS(Edinburgh postpartum depression scale) score ≥10, found the most patients who underwent a cesarean section as many as 11 cases (68.75%). In the Mann-Whitney statistical test, it showed that serum cortisol levels (p=0.007) and EPDS score (p=0.001) had a significant relationship for risk of postpartum blues in dystocia labour.

Conclusions : there was a significant relationship between serum cortisol levels and EPDS score with risk of postpartum blues on dystocia labour.

Keywords : dystocia labour, EPDS score, postpartum blues, serum cortisol level.

Abstrak

Tujuan: *mengetahui adanya hubungan peningkatan kadar kortisol serum pada ibu dengan persalinan distosia.*

Metode: *penelitian ini adalah jenis kohort prospektif (cohort prospective), dengan kelompok ibu yang melahirkan dengan persalinan distosia sebagai kelompok kasus dan ibu yang melahirkan tanpa komplikasi persalinan sebagai kelompok kontrol di Departemen Obstetrik dan Ginekologi Rumah Sakit Umum Pusat (RSUP) Prof.DR.R.D Kandou, dan RS jejaring mulai Oktober 2016 sampai Maret 2017. Data dianalisa dengan SPSS versi 2.0 untuk melihat tingkat kemaknaannya.*

Hasil: *dari 32 subjek penelitian, 16 subjek dengan persalinan distosia dan 16 subjek dengan persalinan normal. Dari seluruh subjek penelitian yang mempunyai kadar kortisol serum postpartum abnormal,berdasarkan jenis pekerjaan, paling banyak adalah ibu rumah tangga dengan 14 subjek (70 %).Berdasarkan tingkat pendidikan, didapatkan paling banyak adalah SD,SMP,SMA sebanyak 18 subjek (90%). Sedangkan subjek yang mempunyai skor EPDS ≥ 10, ditemukan paling banyak subjek yang menjalani prosedur bedah sesar sebanyak 11 pasien (68,75%). Dalam uji statistik Mann-Whitney, menunjukkan bahwa kadar kortisol serum .(p=0.007) dan skor EPDS (p=0.001) mempunyai hubungan yang kuat untuk terjadinya postpartum blues pada persalinan distosia.*

Kesimpulan: *terdapat hubungan bermakna kadar kortisol serum dan skor EPDS dengan postpartum blues pada persalinan distosia.*

Kata kunci: *kadar kortisol serum, persalinan distosia, postpartum blues, skor EPDS.*

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INTRODUCTION

Postpartum blues is a mild affective disorder syndrome that often occurs within the first week after delivery but often occurs on the third or fourth postpartum day and reach peaks between the fifth and fourteen postpartum days. Postpartum blues symptoms occur in about 50%

of postpartum women, of which 20-30 % Occurs in women without a history of major depression before pregnancy, and may continue for up to 6 months postpartum. A history of pregnancy and complicated childbirth can also be a contributing factor to postpartum blues.

One of the cases of complicated labour is dystocia labour.[1,2] Dystocia labour and delivery with cesarean section has a significant relationship with the possibility of postpartum blues. Dystocia labour is usually terminated by operative delivery, including assisted labour (forceps or vacuum), use of epidural analgesia and cesarean section. Interventions in labour may have long-term effects on the mother.[3,4]

Postpartum blues if not appropriately treated can develop into postpartum depression or even more severe symptoms of postpartum psychosis. Psychological stress from the mother, which in the form of fear will be excessive if the birth has many complications. This will lead to stimulation of the hypothalamus-pituitary-adrenal axis (HPA-axis) with the effect of increased ACTH secretion by the anterior pituitary which further stimulates the adrenal cortex to secrete cortisol, with an increased risk of postpartum blues.[5-9] In this study will be observed levels of maternal serum cortisol level and EPDS score who experienced dystocia labour compared with normal deliveries. From the results of this study, it is expected that serum cortisol levels and EPDS score can be used as predictors of postpartum blues.

METHODS

This is a prospective cohort study with statistical analysis aimed at finding out the relationship between serum cortisol levels and the EPDS score *(Edinburgh Postpartum Depression Scale)* in patients with normal labour and dystocia labour. This research was conducted and evaluated from October 2016 until March 2017 in Prof. Dr. R. D.Kandouhospital Manado and affiliation hospitals. The subjects consisted of 32 samples, consisting of 16 patients with normal delivery and 16 patients with dystocia labour. All subjects of this study have entered the inclusion criteria and exclusion criteria and have signed a willingness form to participate in the study.

Data collection is done by following steps: Take blood samples of clients after childbirth on a client with dystocia labour and control groups who give birth normally. At the time of the postpartum client (dystocia labour or by surgical interventions) after having been treated for two days in the puerperal room of Prof.Dr.R.D Kandou hospital and affiliating hospital, the client is given EPDS questionnaire which has described the procedure of the objectives and the filling procedure. At the time of the postpartum client (normal delivery) after having been treated for two days in the puerperium room in the three teaching hospitals, the client is given an EPDS questionnaire which has described the procedure of objectives and the procedure of filling. To the respondents, the case group and control group described the purpose and how to fill out the questionnaire by the researcher. Analysis and data processing carried out by the researcher and statistic supervisor. The data collection will be carried out by the researcher. This is done manually and computerised by using the software program Statistical Product and Service Solution (SPSS) for Windows version 22.0.

RESULTS

This research was conducted and evaluated from October 2016 until March 2017 in Prof. Dr. R. D.Kandou hospital Manado and affiliation hospitals, on the subject of research that entered the inclusion and exclusion criteria. The subjects were 32 samples, consisting of 16 patients with normal delivery and 16 patients with dystocia labour.

Table 1. Characteristics of Research Subjects

Characteristics	n	%
Age		
≤ 20	8	25
21-34	19	59.3
≥ 35	5	15.7
Work		
Housewife	21	65.6
Government Employees	8	25
Private	3	9.4
Level of Education		
Less than a bachelor degree	30	93.75
Bachelor degree	2	6.25
Gravidity		
Primigravid	17	53.13
Multigravid	15	46.87
Method of delivery		
Vaginal delivery	17	53.1
Vacuum extraction	1	3.1
Cesarean section	14	43.8

Table 2. Analysis of Increased Levels of Postpartum Serum Cortisol with Characteristics of Research Subjects

Characteristics	Serum Kortisol ≥ 25 µg (n=20)	%	Normal Serum Cortisol (n=12)	%
Age				
≤ 20	6	30.0	2	16.6
21-34	10	50.0	8	66.6
≥ 35	4	20.0	2	16.6
Work				
Housewife	14	70.0	7	58,3
Government Employees	5	25.0	3	25
Private	1	5.0	2	16,7
Level of Education				
Less than a bachelor degree	18	90.0	11	91,6
Bachelor degree	2	10.0	1	8,4
Gravidity				
Primigravid	14	70.0	3	25
Multigravid	6	30.0	9	75
Method of delivery				
Vaginal delivery	c	35.0	10	83,3
Vacuum extraction	1	5.0	-	-
Cesarean section	12	60.0	2	16.7

Table 3. Analysis of 2nd Day Postpartum EPDS Score With Characteristics of Research Subjects

Characteristics	EPDS Score ≥ 10 (n=16)	%	Normal EPDS Score (n=16)	%
Age				
≤ 20	2	12.50	2	12.5
21-34	11	68.75	9	56.2
≥ 35	3	18.75	5	31.3
Work				
Housewife	9	56.25	9	56.2
Government Employees	4	25.0	5	31.2
Private	3	18.75	2	12.6
Level of Education				
Less than a bachelor degree	13	81.25	14	87.5
Bachelor degree	3	18.75	2	12.5
Gravidity				
Primigravid	8	50.0	8	50
Multigravid	8	50.0	8	50
Method of delivery				
Vaginal delivery	4	25.0	4	25
Vacuum extraction	1	6.25	1	68.7
Cesarean section	11	68.75	11	6.3

Table 4. Statistical Analysis of Postpartum Serum Cortisol Levels and Second Day Postpartum EPDS Score in the Subject of Normal Labor and Dystocia labour

	Normal Labor	Dystocia Labor	
	Mean (n=16)	**Mean (n=16)**	***P-value***
Serum Cortisol Level	24.79	42.61	0.007*
EPDS score	8.63	11.13	0.001*

**significance of p<0.05*

DISCUSSION

From table 1 it was found that subjects with the age of 21-34 years old were 19 subjects (59.3%). Based on the level of education, obtained the most are subjects who have an educational level less than bachelor degree as many as 30 subjects (93.75%), and at least is bachelor degree only two subjects (6.25%).From the result of table 2, most of the age range is 21 - 34 years with ten subjects (50%). From the work, most are housewives with 14 subjects (70%). This is similar with a prospective cohort study conducted by Anna Garcia et al, suggesting that serum cortisol levels begin to increase in women who have childbearing age of 30 years, and there is an increased risk of postpartum blues in women who have childbearing age is older than 35 years old.[10] Meanwhile, from the educational level, the authors found that patients with elevated serum cortisol levels were dominated by patients with less than bachelor degree,18 subjects (90%), and with a bachelor degree is only two subjects (10%). Researchers found that education level has an important role in the stress response mechanism. Subjects with low levels of education are more susceptible to increased serum cortisol levels and lead to a postpartum stress condition. While on subjects with high education, will have knowledge and capabilities in facing a process of physical and psychological stress faced during the childbirth process.[10,11]

Based on the number of gravidities, there are 14 subjects (70%) with primigravida and six subjects (3%) with multigravida. The study found that in primigravida patients there was a higher risk for increased postpartum serum cortisol levels compared with multigravida. Because in primigravid patients, the patient receives a new maternal role in the family, which is to be a mother and a wife and have no experience with it. Because childbearing is a phase that has a major psychological impact, especially in primigravid women. The presence of feelings of fear, anxiety and lack of confidence will be able to pass through the phase, causing excessive stress impact.[7,10] While based on the method of delivery, was found that the most subjects who undergo the cesarean procedure as many as 12 patients (60%) increased serum cortisol levels. From several studies, suggesting that patients undergoing surgical procedures due to dystocia labor have increased serum cortisol levels higher than the control group. This is supported by Selimuzzaman et al found that cortisol levels of patients undergoing emergency cesarean section surgery showed a significant increase in serum cortisol levels. Surgical intervention especially cesarean section generally cause a high level of stress, this is due to excessive fear of the procedure. Fear of the patient can cause increased stress, not only from surgery, but also from the effects of anaesthetic drugs, operating room, surgical equipment, and incision area pain, infection and postoperative reactions. This will lead to stimulation of the hypothalamus-pituitary-adrenal axis (HPA-axis) with the increased impact of ACTH-induced by the anterior pituitary hypothesis, which further stimulates the adrenal cortex to secrete cortisol, and finally will increased risk of postpartum blues.[12]

In addition, Deborah et al in their study obtained serum cortisol levels in patients undergoing dystocia labour and ended with surgical intervention showed a significant increase in cortisol levels. In healthy people, serum cortisol is 5-25 µg, whereas in patients who undergo surgery is around 40.3-64.7 µg, ($p = 0.002$). However, different results were obtained in a study conducted by Poncoroso et al. They suggest higher serum cortisol levels in spontaneous delivery compared with cesarean section (33.59 ± 11.17 in spontaneous labour versus cesarean section 20.96 ± 9.54, with $p = 0.002$).[9,13]

In this study, the authors used the Edinburgh Postpartum Depression Scale (EPDS) instrument. Based on his age, most are 21 - 34 years old with 11 subjects (68.75%). From a study conducted by Latifah et al who reviewed the EPDS score with the risk of postpartum blues, it showed the younger patients, it will be the higher EPDS score in the case group than the control group ($p = 0.001$). However, other studies found that maternal age over 32 years, showed an increased risk of stress during labour compared with women aged 25-31 years.[14,15] [15] While in this study, the authors found the subjects with age ≤ 20 years only as much as two subjects (12.5%). Aasheim et al suggests that maternal age plays an important role because, in younger patients, they will be able to deal with physical and psychological stress than that of older mothers.[15]

From Table 3, it was found that most subjects had an abnormal EPDS score were those who worked as housewives, as many as nine patients (56.25%). And the least is private, as many as three patients (18.75%), this is in line with the reference from Sara et al study, which suggests that a low socioeconomic state is a risk factor for postpartum blues. In addition to other risk factors is the level of education has an important role as a risk factor for postpartum blues, where the authors found that the majority of patients who have a score of EPDS ≥10 (table 3), are the subject of research that only has education level less than bachelor degree, as many as 13 patients (81.25%), and the least were subjects with bachelor degree education level, as many as 3 patients (18,75%).[16]While the most common method of childbirth is that patients undergoing cesarean section surgery due to dystocia labour are 11 patients (68.75%), this means that the surgical procedure is closely related to the risk of postpartum blues.[9] The prospective cohort study by Sword et al found that labour methods such as cesarean section and other operative procedure were associated with an increased odds ratio of the incidence of postpartum blues.[16,17]

With Mann-Whitney test analysis, it showed that there was a significant difference between cortisol levels and EPDS score in case group (*postpartum blues* in dystocia labour) with the control group (without postpartum blues) (p = 0.007 and p = 0.001, respectively). This suggests a significant relationship between elevated serum cortisol levels and EPDS score on postpartum blues events in dystocia labour. The results of this study are in line with research by Shelton et al which explains that there is a relationship between dystocia labour with postpartum blues events. Salacz et al also mentioned that complications experienced by mother during the prenatal and intrapartum periods are associated with postpartum depression or postpartum blues.[18,19]

CONCLUSION

There was a correlation between elevated serum postpartum cortisol levels (p = 0.007) and EPDS score (p = 0.001) with postpartum blues on study subjects with dystocia labor.

SUGGESTION

In further studies it is better to use larger and longer-term samples by controlling confounding factors to obtain more valid results

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