Some medical and other risk factors for current cesarean section in a Jakarta hospital

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Abstrak

Akhir-akhir ini prevalensi seksio saesaria (SS) meningkat di beberapa negara termasuk Indonesia. Namun, di Indonesia belum pernah dilakukan penelitian komprehensif tentang faktor risiko yang berkaitan dengan SS. Metode penelitian ialah kasus-kontrol dengan memakai data yang diekstraksi dari catatan medik Rumah Sakit Fatmawati Jakarta dari 1 Juli 2000 sampai 31 Januari 2001. Kasus ialah yang melahirkan dengan cara SS, dan kontrol ialah yang melahirkan per vaginam. Untuk setiap kasus dipilih secara acak seorang kontrol sesuai dengan periode sebelum atau setelah 18 Oktober 2000. Subjek yang mengalami gawat janin mempunyai 544-lipat kenaikan risiko SS dibandingkan dengan yang tidak gawat janin [rasio odds suaian (OR) = 544,86; 95% interval kepercayaan (CI) = 71,85 - 4131,78]. Di samping itu, relatif terhadap yang tidak mempunyai distosia, yang distosia mempunyai risiko 143 kali risiko SS (OR suaian = 52,86; 95% CI = 52,86 - 391,17). Sedangkan yang pernah SS mempunyai risiko 30 kali risiko SS dibandingkan dengan subjek yang tidak pernah SS (OR suaian = 30,23; 95% CI = 12,06 - 75,57). Namun, dibandingkan dengan yang membayar tidak tunai, mereka yang mebayar tunai mempunyai risiko 80% lebih kecil (OR suaian = 0,20; 95% CI = 0,11 - 0,34). Sebagai kesimpulan, kepernahan SS, distosia, pre eklamsia, indikasi medis lainnya, gawat janin, dan yang membayar tidak tunai mempertinggi risiko SS. ***(Med J Indones 2001; 10: 230-4)***

Abstract

For the last years the prevalence of cesarean section (CS) increased in several countries as well as in Indonesia. In Indonesia there was no comprehensive study on risk factors related to CS. This case-control study was conducted at Fatmawati Hospital in Jakarta from 1 July 2000 until 31 January 2001. Data was extracted from available medical records. Cesarean section was defined as a delivery through laparotomy. The control group consisted of subjects having vaginal deliveries. For each cases were selected randomly a control based on the date before or after 18 October 2000. Subjects who had fetal distress had 544-folds increased risk to be CS relative to those who did not have fetal distress [adjusted odds ratio (OR) = 544.86; 95% confidence intervals (CI) = 71.85 - 4131.78]. Furthermore, relative those who did not have dystocia, those who had dystocia had 143 times increased risk to be CS (adjusted OR =52.86; 95% CI = 52.86 - 391.17). In term of previous CS, subjects who ever had previous CS had 30 times increased risk to be CS compared with the subjects who never had CS (adjusted OR = 30.23; 95% CI = 12.06 - 75.57). In contrast, compared with those who non cash payment, those who paid in cash had a lowered risk of 80% (adjusted OR = 0.20; 95% CI = 0.11 - 0.34). In conclusion, previous CS, dystocia, pre eclampsia, other medical indications, fetal distress, and non cash hospitalization expenses increased risk of CS. ***(Med J Indones 2001; 10: 230-4)***

Keywords: *cesarean section, risk factors*

Recently, the prevalence of cesarean section (CS) increased in several countries[1,2] The same condition occurred in Indonesia.[3] At Dr. Cipto Mangunkusumo Hospital Jakarta, a national top referral hospital in Indonesia, the section rate was relatively high and almost reached 40% in 2000. At Fatmawati Hospital, a teaching and referral hospital in southern part of Jakarta, the proportion between CS and vaginal deliveries was 31% in 1999 (personal communication).

Several medical and socio economic risk factors related to SC were reported.[1-4] CS more likely is performed among women who have high annual income more than less annual income, and there is an indication that malpractice related to CS.[1-3]

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Recently, the Ministry of Health of the Republic of Indonesia indicated that there are increase number of CS with unclear indications in several hospitals in Indonesia.[5] However, in Indonesia there was no comprehensive study on risk factors for CS. Therefore, we conducted a study to analyze the medical and non medical risk factors for SC.

METHODS

This case-control study was conducted at Fatmawati Hospital (a teaching and referral hospital) in Jakarta from 1 July 2000 until 31 January 2001. Data was extracted from the available medical records.

Cesarean section cases were taken during the period of the study. Cesarean section was defined as a fetal delivery method through laparotomy or hysterectomy except due to uterine rupture, placenta previa, carcinoma cervix, herpes genitalia.[6-8]

The control group consisted of women who had vaginal deliveries (spontaneous delivery extraction version, vacuum, or forceps deliveries).[6-8] For each case we selected randomly a control from eligible would be controls based on the date before or after 18 October 2000 (the date of Ministry start of Health medical audits).

For cases and controls, information collected were some demographic characteristics (age, education, occupation), obstetrics and gynecologic risk factors (pregnancy, parity, previous SC, previous abortion, pre-eclampsia, fetal distress, dystocia), nursing class, and method of payment.

Previous cesarean section was defined as any previous CS. Dystocia is a failure of delivery process due to cephalo pelvic disproportion, mal-position, mal-presentation, macrosomia, meningocele, hydro-cephalus, gemeli, primary inertia uteri, secondary inertia uteri, or failed induction.[6-8]

Other medical indications included intra partum infection related to induction, heart failure, other heart disease, other diseases, diabetes mellitus, infertility, ante partum bleeding.[6-8]

For this analysis we categorized education as follow. Lower education subgroup consisted of those who were illiterate, have not finished, or finished primary school. Middle education subgroup included those who had junior or senior high school education. While high education included those who finished college or university.

Occupation was the last occupation at the time of the delivery. Jobless included housewives, while any jobs included labors, merchants, private and government employees, hospital staff, etc.). Gravidity consisted of two subgroups (first gravida, and second gravida or more).

We categorized parity into a nulli para and non nulli para. Nulli para were those who never had delivered a viable fetus. Nursing class was divided into two subgroups. Low nursing class was third or non air-conditioned second class, while high nursing class consisted of air-conditioned second class, first class, very and super important classes. Methods of payments were at the of discharge (cash and non cash payment). Non cash payment included installment, insurances, or credit cards).

Statistical analyses were done using STATA 6.0 software.[9] A number of risk factors were examined whether they were potential confounders and/or effect modifiers. Unconditional logistic regression analysis[10] was used in order to determine the confounding effects and to determine the risk factors for CS. Confounders were estimated by the method of maximum likelihood. Ninety-five percent confidence intervals were based on the standard error of coefficient estimates. Relative risks represented by odds ratios (OR) were estimated by the methods of maximum likelihood.[10] A risk factor was considered to be a potential confounder if in the univariate test it had a P-value < 0.25 which would be considered as a candidate for the multivariate model along with all known risk factors for CS.[11]

RESULTS

During the period of 1 July 2000 until 31 January 2001 there were 1136 deliveries consisted of 365 CS and 859 vaginal deliveries. We excluded 92 subjects with incomplete data (seven CS subjects and 85 vaginal delivery subjects). Furthermore we excluded 47 CS subjects (CS cases who had placenta previa, carcinoma cervix, or herpes genitalia leaving 311 CS in this analysis. We selected randomly 311 out of 774 vaginal delivery subjects, based on the date before and after 18 October 2000.

Cesarean section and vaginal delivery subjects were similarly distributed in respect to age and pregnancy period. Cesarean section subjects were more likely than vaginal delivery subjects with respect to high education and had any jobs. However, CS subjects were less likely than vaginal delivery subjects with respect to middle education (Table 1).

Table 1. Some demographic characteristics of subjects

	Vaginal delivery (N=311)		Cesarean section (N=311)	
	n	%	n	%
Age group				
17 – 19 years	12	3.9	12	3.9
20 – 34 years	247	79.2	236	76.2
35 – 47 years	52	16.7	62	19.9
Length of pregnancy				
20-27 weeks	5	1.6	1	0.3
28-37 weeks	55	17.7	50	16.1
38-43 weeks	251	80.7	260	83.6
Education				
Low	49	15.8	47	15.1
Middle	215	69.1	196	63.0
High	47	15.1	68	21.9
Occupation				
Jobless	239	76.9	228	73.3
Any jobs	72	23.1	83	36.7

Table 2 shows that CS and vaginal delivery subjects were similarly distributed in respect to pregnancy and parity. However, CS subjects were more likely than vaginal delivery subjects with respect to previous abortion and nursing class.

Table 2. Some obstetrics, gynecological, and economic characteristics of subjects

	Vaginal delivery (N=311)		Cesarean section (N=311)	
	n	%	n	%
Gravida				
Primi gravida	128	41.2	123	39.6
Multi gravida	183	58.8	188	60.5
Parity				
Multi parous	175	56.3	171	55.0
Nuly parous	136	43.7	140	45.0
Previous abortion				
Never	280	90.0	262	84.2
Ever	31	10.0	49	15.8
Nursing class				
Low	265	85.2	245	78.9
High	46	14.8	66	21.2

Our final model on the relationship between some risk factors and CS was shown on Table 3.

The model indicates that those who had previous CS, dystocia, pre eclampsia, and other medical indications, or fetal distress had increased risk to have CS. The most prominent is fetal distress. Subjects who had fetal

Table 3. Relationship between some medical indications, method of payment and risk of current cesarean section

	Vaginal delivery (N=311)		Cesarean section (N=311)		Odds ratio*	95% confidence interval
	n	%	n	%		
Previous cesarean section						
Never	303	97.4	272	87.5	1.00	Reference
Ever	8	2.6	39	12.5	30.23	12.09 - 75.57
Dystocia						
No	306	98.4	197	63.3	1.00	Reference
Yes	5	1.6	114	36.7	143.80	52.86 - 191.87
Pre eclampsia						
No	283	91.0	271	87.1	1.00	Reference
Yes	28	9.0	40	12.9	8.10	4.09 - 16.04
Other medical indications						
None	273	87.8	249	80.1	1.00	Reference
Any	38	12.2	62	19.9	8.10	4.12 - 14.44
Fetal distress						
No	3101	99.7	227	73.0	1.00	Reference
Yes		0.3	84	27.0	544.86	71.85 - 4131.78
Methods of payment						
Non cash	59	19.0	149	47.9	1.00	Reference
Cash	252	81.0	162	52.1	0.20	0.11 - 0.34

* Adjusted odds ratio toward each others

distress had 544-folds increased risk to be CS relative to those who did not have fetal distress. The second prominent risk factor was dystocia. Relative those who did not have dystocia, those who had dystocia had 143 times increased risk to have CS. In term of previous CS, subjects who ever had previous CS had 30 times increased risk to be CS compared with the subjects who never had CS. In contrast, subjects who paid cash had a lowered risk to be CS. Compared with those who paid non cash, those who paid hospitalization cost in cash had a lowered risk of 80%.

DISCUSSION

There are several limitations that must be considered in the interpretation of our findings such as following. Firstly, our data is come from a relatively short period, from 1 July 2000 to 31 January 2001 (7 months). Our data most likely not is a representative sample for the whole CS problems at the hospital. In addition, our data came from a teaching, referral, and government hospital. This hospital serves government and private insurance schemes for further treatment including CS, and does not fix catchment areas. Therefore, most likely our data do not reflex a certain community in term CS problems.

Secondly, our data were extracted from the available routine medical records filled by different treating physicians at the hospital. In addition, some medical records had missing data (characteristic of subjects, obstetric history, nursing class, and methods of payment) that were needed for this study. Thirdly, our analysis was limited to some medical and non medical risk factors. Therefore, we could not analyze the whole existing risk factors.

In spite of these limitations, the attending physicians at the hospital were qualified trained properly to diagnose and treat CS. In addition, the attending physicians were supervised routinely by their supervisors based on the hospital standard of operating procedures.

Fetal distress. Our final model reveals that fetal distress is the most dominant risk factor for CS. Our finding is similar with other reports.[1-3, 6-8] However, our data had a wide 95% confidence intervals (71.85 to 4131.78). This wide range was due to the only one subject among the women with fetal distress who had vaginal delivery. This one referred case happened because on arrival at the hospital the woman was fully dilated for a spontaneous delivery. There was no need to perform CS.

Dystocia. Our final model shows that dystocia was the second prominent risk factor for CS (adjusted OR = 143.80) with a wide 95% confidence intervals. This wide range was due to a small number (five subjects) among women with vaginal delivery who had dystocia. Most of obstetrics and gynecologists at the Fatmawati Hospital will perform CS for women who have dystocia based on the standard of procedure.[13] They used not to take a risk to perform vaginal deliveries for those with dystocia.

Previous cesarean section. Our study noted that previous CS is a risk factor for CS. This is in accordance with previous reports.[1-3] A report from 16 hospitals in New York City[3], where legal claims are common, revealed that the risk of CS to related to previous CS is 18.7 folds. While our data showed 30.2 times increased risk. Our higher finding is most likely due to the uncommon legal claims in Indonesia.

Other medical indications. Our category for other medical indications included intra partum infection related to induction, heart failure, other heart disease, other diseases, diabetes mellitus, infertility, and ante partum bleeding. The final model revealed that compared with those who did not have any other medical indications, those who had any other medical indications had an increased risk to have CS. This finding similar with other previous findings,[1-3]

Methods of payment. Our data reveals that subjects who paid cash had a lowered risk to be CS. Compared with those who paid non cash, those who paid hospitalization cost in cash had a lowered risk of 80%. This condition most likely due to Fatmawati Hospital is a teaching, referral and government hospital. This hospital also serves government and private insurance schemes for further treatment including CS. In general, the insurance schemes do not allow spontaneous or vaginal deliveries to be referred to the higher level of medical service and hospital such as Fatmawati Hospital. In addition, in our study, the method of payment using credit card is considered as a non cash payment. As shown on Table 1, CS subjects were more likely to have high

education. Most likely the higher educated people pay their expenses using credit cards. This caused the subjects using non cash payment (including insurance schemes and credit cards) had a higher risk to have CS compared with subjects using non cash payment.

Pre eclampsia. Our finding on pre eclampsia is in accordance with previous studies.[1-3,14] However, our final model shows that compared with women without pre eclampsia, those who had pre eclampsia had an 8-folds more to have CS. Our figure is higher than the previous studies.[2] Our higher figure most likely due to the fact that Fatmawati Hospital is a referral, government, and reaching hospital. Most of the subjects did not have their ante natal care at the Fatmawati Hospital. They were referred at the time to deliver, therefore, the hospital did not have enough time to control their pre eclampsia.

In conclusion, previous CS, dystocia, pre eclampsia, other medical indications, fetal distress, and non cash hospitalization expenses increased risk of CS.

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