

Signs or symptoms of complications in pregnancy and risk of caesarean section: an Indonesia national study

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Abstrak

Latar belakang: Pada beberapa tahun terakhir kejadian seksio sesarea (*c-sesarea*) meningkat. Tujuan analisis ialah untuk mengidentifikasi beberapa tanda atau gejala yang berbahaya selama kehamilan terhadap *c-sesarea*.

Metode: Analisis ini memakai sebagian data Riset Kesehatan Dasar (*Riskesdas*) 2010. Sub-sampel dengan metode multistage stratified sampling di seluruh Indonesia di antara wanita yang menikah atau pernah menikah berumur 10-49 tahun yang melahirkan bayi antara 1 January 2005 sampai 31 August 2010. Analisis mempergunakan regresi Cox dengan waktu konstan.

Hasil: Prevalensi *c-sesarea* sebesar 10,8% di antara 20.501 wanita. Rasio prevalensi kota dan desa ialah 2,9. Wanita yang pernah dibandingkan yang tidak pernah mengalami sebarang tanda atau gejala komplikasi kehamilan berisiko lebih besar mengalami *c-sesarea*. Wanita yang pernah dibandingkan yang tidak pernah mengalami demam tinggi berisiko 2,3-lipat *c-sesarea* [risiko relatif suaitan (*RRa*) = 2,33; 95% interval kepercayaan (*CI*) = 1,69-3,34]. Wanita yang pernah mengalami dibandingkan yang tidak pernah mengalami perdarahan per vaginam berisiko 2,1-lipat mengalami *c-sesarea* (*RRa* = 2,12; 95% *CI* = 1,5-2,58). Risiko yang terkecil (96%) terjadi pada wanita yang pernah mengalami kejang atau pingsan (*RRa* = 1,96; 95% *CI* = 1,41-2,73).

Kesimpulan: Wanita yang pernah dibandingkan yang tidak pernah sebarang tanda atau gejala komplikasi kehamilan berisiko lebih besar mengalami *c-sesarea*. (*Health Science Indones 2011;2:71-6*)

Kata kunci: seksio sesarea, persepsi masyarakat, komplikasi, , Indonesia

Abstract

Background: In the last years, the frequency of cesarean section (*c-section*) has risen. This study was aimed to identify several signs or symptoms of complications during pregnancy increased the risk of *c-section* (*c-section*).

Methods: Data were derived from the Basic Health Survey (*Riskesdas*) 2010. The sub-sample was married or divorced women aged 10-49 years between January 1, 2005 and August 2010 in Indonesia based on multistage stratified sampling methods. Analysis used Cox regression with constant time.

Results: The *c-section* rate was 10.8% among 20,501 women. Urban and rural ratio of *c-section* rate was 2.9. Women who reported than who did not report any signs or symptoms of complications during their pregnancies had a higher risk of *c-section*. Women who reported **high fever** had 2.3-fold for *c-section* [adjusted relative risk (*RRa*) = 2.33; 95% confidence interval (*CI*) = 1.69-3.34]. Moreover, those who reported compared to those who did reported **bleeding** had 2.1-fold increase risk of *c-section* (*RRa* = 2.12; 95% *CI* = 1.75-2.58). The lowest risk (96%) was among those who ever had convulsion/fainted (*RRa* = 1.96; 95% *CI* = 1.41-2.73).

Conclusion: Women who reported any signs or symptoms of complications during their pregnancies had an increased risk of *c-section*. (*Health Science Indones 2012;2:71-6*)

Key words: cesarean section, community perception, pregnancy complications, Indonesia

In developing countries, the frequency of cesarean section (c-section) has risen in the past few years.¹ Prior studies reported an inverse association between c-section rate and maternal and infant mortality at population level in low income countries.^{1,2}

Although c-section is considered relatively safe, it poses a higher risk of some complications than a vaginal delivery, in addition, risks of certain peripartum complications have long been associated with c-section.³ Furthermore, c-section rates above a certain limit have not shown additional benefit for the mother or the baby, and some studies have reported that high c-section rates could be linked to negative consequences in maternal and child health.⁴

The trend toward increasing c-section suggests that the incidence of those complications might also be on the rise. On the other hand, the impact of c-section trends might be modified by changes in population health or improvements in obstetric care.⁵

Most prior studies, however, presented clinical complications related to c-section risk. Few reviewed community perceptions of medical complications during pregnancy related to c-section. This study aimed to identify several community perceptions on signs and symptoms that indicate complications in pregnancy related to the risk of c-section.

METHODS

The data analyzed originated from the Basic Health Survey (Riskesdas) 2010 of Indonesia. Riskesdas 2010 is a cross sectional survey which provided specific information on the health Millennium Development Goals (MDG) according to the commitment of global health efforts at the national and provincial level.⁶

Sampling was multistage stratified sampling.

Specially trained interviewers collected data using the questionnaire. The interviewers consisted of 104 teams. Each team consisted of one supervisor, one field editor and data entry, and two interviewers.

Some indicators collected include nutritional status of children, maternal and child health status, malaria and tuberculosis, access to drinking water sources, as well as the safe and basic sanitation facilities.

Data were collected through interviews and measurements. Laboratory tests for diagnosis of malaria and

tuberculosis were performed in the field at the respective referred public health centers.

The eligible population was all households in the entire Republic of Indonesia having equal probability of being included. Nationally representative sample of Riskesdas 2010 was 33 provinces with over 441 districts/cities of the total 497 districts/cities in Indonesia. The interview was held in the respondent's home. The subjects consisted of 69,300 households, with 251,388 respondents, and 20,591 ever or still married women age 10-59 years.

The sub-sample included in the analysis were women meeting all criteria: (1) who gave birth of their last child between January 1, 2005 and August 2010, (2) who did not have ectopic pregnancy, (3) aged 10-49 years. For this analysis, 30 subjects were excluded because of ectopic pregnancy, 50 women because their age were 50-59 years, and 10 subjects because of incomplete data, leaving 20,501 subjects for this analysis.

Riskesdas 2010 study was approved by the Ethical Committee of National Institute of Health Research and Development (NIHRD) Ministry of Health of Republic of Indonesia.

For this analysis, women were classified as having a c-section if the c-section was either done at a government, private, or maternity hospital and if assisted by medical doctors.

Risk factor variables consisted of suspected complications during pregnancy, baby size at birth, antenatal care (ANC), term of delivery, and demographic characteristics (i.e age group, education, working status, place of living and levels of expenditure per capita). Perception on signs and symptoms that indicate pregnancy was threatened based on mother's report consisted of 6 subgroups (none, very painful stomach ache, bleeding, high fever, convulsion/collapse, and others)

Baby size was consisted of five subgroups based on mother's perception of the baby size after birth (average, very small, small, large, and very large).

Antenatal care was divided into two subgroups (complete and incomplete). Women were classified as having a complete ANC if they mentioned height and weight measurements, blood pressure measurement, urine sample taken, abdominal examination, and informed of signs of pregnancy complications.

Term of delivery was divided into 3 subgroups (aterm, preterm and postterm). Women were classified as aterm delivery if they delivered in 9 months of pregnancy; preterm if they had delivery in 7-8 months of pregnancy; and postterm if they had delivery in 10 months of pregnancy.

Maternal age was into 3 subgroups (13-19 years, 20-34 years, and 35-49 years). Education was based on the last education obtained by the respondent (none, primary education, secondary education or above). Never and no primary education were grouped together into none, primary and junior high school were grouped together into primary education, high school or above were grouped together.

Working status was divided into housewife/student, private/government employee, farmer/fisherman/laborer, and others. Place of living was divided into urban and rural. Level of expenditure per capita originally was divided into 5 levels, with quintile 5 as the highest quintile and the lowest or poorest quintile was 1.

To assess the risk of c-section, the data were analyzed by Cox regression with constant time.⁶ The analysis

used STATA 9.0 software. NIHRD gave permission to analyze part of Riskesdas 2010 data.

RESULTS

The youngest subject who had c-section was 16 years old. Table 1 showed the women who had c-section rate was 10.8% (2,217 among 20,501 women, and urban-rural c-section rate ratio was 2.9 16.1%/5.5%). Most of the subjects had lower education (52.2%), and aged 20-34 years (70.7%).

Table 1 showed that the highest occurrence of c-section was found in women with 35-49 years of age, secondary education or above, private/government employee, living in urban area, and has the highest level of expenditure per capita subjects.

Furthermore Table 1 noted that older, private/government employee or farmer/fisherman/laborer, living in urban area, higher parities, term as well as postterm pregnancy, complete ante natal care, and more wealthy were more likely to have c-section deliveries.

Table 1. Several demographic factors and the risk of c-section

	Delivery				Crude relative risk	95% confidence interval	P
	Vaginal (n=18,284)		C-section (n=2,217)				
	n	%	n	%			
Residence							
Rural	9,723	94.5	571	5.5	1.00	Reference	
Urban	8,561	83.9	1,646	16.1	2.91	2.64-3.20	0.000
Age group							
13-19 years	516	93.3	37	6.7	1.00	Reference	
20-34 years	12,968	89.5	1,529	10.6	1.58	1.14-2.18	0.006
35-49 years	4,800	88.1	651	11.9	1.79	1.28-2.49	0.001
Education							
None	2,422	95.7	108	4.3	1.00	Reference	
Primary education	10,003	93.5	700	6.5	1.53	1.25-1.88	0.000
Secondary education or above	5,859	80.6	1,409	19.4	4.54	3.73-5.52	0.000
Working status							
Housewife/student	9,404	89.8	1,063	10.2	1.00	Reference	
Private/government employee	3,206	80.7	767	19.3	1.90	1.73-2.09	0.000
Farmer/fisherman/laborer	3,761	95.3	185	4.7	0.46	0.39-0.54	0.000
Others	1,913	90.5	202	9.6	0.94	0.81-1.09	0.424
Level of expenditure							
Lowest	4,889	96.0	203	4.0	1.00	Reference	
Second	4,274	93.5	296	6.5	1.63	1.36-1.94	0.000
Middle	3,833	90.1	420	9.9	2.48	2.09-2.93	0.000
Fourth	3,165	85.0	560	15.0	3.77	3.21-4.43	0.000
Highest	2,123	74.2	738	25.8	6.47	5.54-7.56	0.000

Table 2 noted that women with higher parity were less likely to have c-section deliveries. On the hand, those who with preterm as well as postterm pregnancies, complete ante natal care, and did not deliver normal baby were more likely to be c-section delivery.

Table 3 showed that women who did not have any signs or symptoms of complications during their pregnancies were 93.5% (1,865/19,172). The most common (1.3%) reported signs or symptoms of complication during their pregnancies was bleeding (276/19,172), and 1.2% women was very severe abdominal pain (256/19,172).

The least were fever, 0.6%, and convulsions, 0.7% (113/19,172 and 138/19,172 respectively).

In the final model (Table 3), revealed that compared to women who did not report complication before their labors, all women who reported complications during pregnancy had a higher risk of experiencing c-section. Women who reported high fever had 2.3-fold risk of experiencing c-section. The lowest risk was among women who reported very severe abdominal pain, which had a 21% increase in experiencing c-section.

Table 2. Several gynecologic factors and the risk of c-section

	Delivery				Crude relative risk	95% confidence interval	P
	Vaginal (n=18,284)		C-section (n=2,217)				
	n	%	n	%			
Parity							
1-2	11,862	87.6	1,676	12.4	1.00	Reference	
3-5	5,612	91.7	509	8.3	0.67	0.61-0.74	0.000
6-15	810	96.2	32	3.8	0.31	0.22-0.44	0.000
Pregnancy							
Aterm	17,224	89.8	1,948	10.2	1.00	Reference	
Preterm	625	77.5	181	22.5	2.21	1.90-2.57	0.000
Postterm	435	83.2	88	16.8	1.66	1.34-2.05	0.000
ANC completeness							
Incomplete	16,826	90.1	1,851	9.9	1.00	Reference	
Complete	1,458	79.9	366	20.1	2.03	1.81-2.27	0.000
Baby size							
Average	13,082	90.5	1,374	9.5	1.00	Reference	
Very small	112	73.2	41	26.8	3.49	2.43-5.01	0.000
Small	1,057	85.9	173	14.1	1.56	1.31-1.85	0.000
Large	3,493	86.6	539	13.4	1.47	1.32-1.63	0.000
Very large	540	85.7	90	14.3	1.59	1.26-1.99	0.000

Table 3. Sign or symptoms of complication during pregnancies that indicate threatened pregnancy and risk of c-section

	Delivery				Adjusted relative risk*	95% confidence interval	P
	Vaginal (n=18,284)		C-section (n=2,217)				
	n	%	n	%			
Complication during pregnancy							
None	17,307	90.3	1,865	9.7	1.00	Reference	
Very severe abdominal pain	221	86.3	35	13.7	1.21	0.89-1.67	0.221
Bleeding	199	72.1	77	27.9	2.12	1.75-2.58	0.000
High fever	87	77.0	26	23.0	2.33	1.69-3.34	0.000
Convulsion/collapse	111	80.4	27	19.6	1.96	1.41-2.73	0.000
Others	359	65.8	187	34.2	2.57	2.25-2.94	0.000

*Adjusted for residence, age group, education, working status, parity, antenatal care completeness, level of expenditure, and baby size.

DISCUSSION

Several limitations must be considered in interpreting the findings. Firstly, this analysis was based on data from a national wide survey (Riskesdas 2010). Secondly, data on complications during pregnancy and baby size were based on community perception of medical complications during pregnancy and baby size women perceptions. Thirdly, the Riskesdas 2010 did not have detailed risk factors data related to c-section, such as, on placenta previa and abruption, breech position, cord prolapsed, failure to progress in labor, repeated caesarean sections, cephalopelvic disproportion, fetal distress, birth defects, and multiple births, and demand to have caesarean section from the subjects as well as from the respective medical doctors. In spite of these limitations, this study used a national wide survey with a large sample consisting of 20,591 ever or still married women.

Our analysis noted that the rate of women who had c-section was 10.8%, and the ratio of c-section between urban and rural was 2.9 times. The c-section rate was found to be higher than previous reports based on calculated regional c-section rates in Southeast Asia, which was 5%.¹

But this finding was almost similar to the best current estimate of the overall rate of c-section delivery in developing countries, which was 12%, based on a study using nationally representative data from 82 nations with a median reference year of 1996.¹

On the other hand, findings on urban-rural rate ratio was almost similar to the ratio among urban women in the developing world, which was on average, three times as high as those among rural women.⁸

Indonesia is a developing country with both high rates of maternal mortality and a marked disparity in c-section rate between urban and rural women. The low c-section rate in rural showed that those who are at greatest risk for obstetric complications do not have adequate access to the procedure as stated in a prior study.¹

Furthermore, the rate of women who had c-section was within range of the World Health Organization (WHO) recommendation that a nation's c-section birth rate should be in the range of 5–15%.⁸ However, this recommendation is questionable.⁹

The finding showed that the percentage of women who did not have any signs or symptoms of complications

during their pregnancies was 93.5% out of 19,172. This number was higher than previous report (Indonesia Demography and Health Survey – IDHS 2007-2008) which noted that 89% out of 14,043 women reported no complications during their pregnancy.⁷ Moreover, the findings revealed the most common complaints was bleeding (1.3%), followed by very severe abdominal pains (1.2%). The least ones were fever, 0.6% and convulsion, 0.7%. On the other hand, the IDHS report revealed among those who reported complications, 3% had excessive vaginal bleeding, and 1% had fever.⁷

Bleeding, fever, and convulsion were relatively small percentage, but these three complaints increased the risk of c-section by about 2-fold for each (relative risk of 2.12; 2.33; and 1.96 respectively). Therefore, these three complaints are recommended to be considered as early warning potential factors which increased the risk of c-section and have to be detected during ANC visits.

In conclusion, women who reported any signs or symptoms of complications during their pregnancies that indicate pregnancy were threatened had an increased risk of c-section.

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