Risk factors of post partum haemorrhage in Indonesia

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Abstrak

Latar belakang: *Perdarahan post-partum (PPH) merupakan salah satu trias klasik penyebab kematian ibu. Studi ini mengevaluasi beberapa faktor risiko PPH, khususnya riwayat antenatal, natal, dan post-natal.*

Metode: *Analisis menggunakan sebagian data dari studi potong lintang Riset Kesehatan Dasar (Riskedas) 2010. Subjek yang dipakai unuk analisis ini ialah wanita yang menikah **berumur 13-49 tahun** dan melahirkan anak terakhir antara 1 Januari 2005 sampai 31 Juli 2010. Perdarahan post-partum berdasarkan konfirmasi petugas kesehatan tentang telah terjadinya perdarahan dua atau lebih kain (masing-masing 1,5 m) selama proses persalinan.*

Hasil: *Pada analisis ini terdpat 601 subjek yang mengalami PPH dan 19.583 subjek tidak mengalami PPH. Eklamsia meningkatkan risiko PPH 3,5 kali (95% interval kepercayaan (CI) = 2,53–4,69), ketuban pecah dini meningkatkan risiko PPH 2,2 kali (95% CI = 1,69-2,83), placenta previa meningkatkan risiko PPH 2,1 kali (95% CI = 1,29-3,31). Dibandingkan kehamilan aterm, wanita dengan kehamilan prematur berisiko PPH 82% lebih tinggi (95% CI = 1,33–2,49), sedangkan yang dengan kehamilan post-term berisiko PPH 72% lebih tinggi (95% CI = 1,16–2,57). Dibandingkan wanita dengan paritas 1-2, risiko PPH pada wanita yang berparitas 3-5 dan 6 atau lebih berturut-turut adalah 24% dan 81% lebih tinggi.*

Kesimpulan: *Eklampsia merupakan faktor risiko PPH terkuat. Placenta previa, ketuban pecah dini, kehamilan prematur atau post-term, serta paritas yang tinggi juga meningkatkan risiko PPH. (**Health Science Indones 2011;2:66-70**)*

Kata kunci: *perdarahan postpartum, eklampsia*

Abstract

Background: Post-partum haemorrhage (PPH) is one of the classic triad of causes of maternal death. This analysis aimed to evaluate several risk factors of PPH.

Methods: This analysis using a cross-sectional Basic Health Research (Riskesdas) 2010 data. For this analysis, the subjects consisted of married women **aged 13-49 years,** who gave birth of their last child between January 1, 2005 and August 2010, who had a probability of PPH history. The PPH was defined as bleeding more than two wet pieces materials, 1.5 m each, during giving birth.

Results: This analysis noted 601 subjects had PPH and 19,583 subjects did not have PPH. Post-partum haemorrhage related to demographic (education level, and economic level), gynecologic (parity) as well as obstetric factors. Those who had than did not have eclampsia had 3.5-fold PPH [95% confidence interval (CI) = 2.53–4.69]. Those who had than did not have premature rupture of the membranes had 2.2-fold PPH (95% CI) = 2.53–4.69). Those who had than did not have placenta previa had 2.1-fold PPH (95% CI) =1.29–3.31). In term of uterine rupture, those who had than did not uterine rupture had 65% increase PPH (95% CI) = 1.11–2.46). Compared to women with 1-2 parity, women with 3-5 and 5 or more parity had an increased PPH risk for 24% and 81% respectively.

Conclusion: Eclampsia was the strongest risk factor of PPH. Other risk factors of PPH include premature rupture of the membranes, placenta previa, premature or post-term pregnancies, and high parity. (***Health Science Indones 2011;2:66-70***)

Key words: post-partum haemorrhage, eclampsia

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In developing countries, maternal mortality rates (MMR) are still higher than 100 women per 100,000 live births.[1] The World Health Organization's statistics suggest that 25% of the maternal deaths are due to PPH, accounting for more than 100,000 maternal deaths per year.[2] It was estimated that there were 140,000 maternal deaths per year or 1 woman died every 4 minutes.[3]

The Indonesian Demographic and Health Survey (IDHS) in 2007 indicated that the MMR in Indonesia was the highest in Asia (228 per 100,000 live births). This rate was about 3-6-time higher than MMRs in South East Asian countries and more than 50 times MMR in developed countries. The National Medium-Term Development Plans (RPJMN) in 2005-2009 targeted a reduction of MMR from 390 in 1990 to 228 per 100,000 live births in 2007.[4]

According to the Ministry of Health Report in 1998, the main causes of maternal mortality (more than 90%) in Indonesia are the triad classic, namely haemorrhage (40%-60%), toxemia gravidarum (20%-30%) and infection (20%-30%). The causes of the classic triad are known as the "three late": too late to recognize the danger signs of the pregnancy, too late to refer the mother to a referral center, and too late to get help by the health provider.[5]

The National Institute of Health Research and Development conducted the Basic Health Research (Riset Kesehatan Nasional or Riskesdas) in 2010. One aspect observed in Riskesdas 2010 was the health of the pregnant women. Therefore, Riskesdas 2010 was expected to provide evidence-based data about post partum haemorrhage (PPH). This analysis aimed to evaluated several risk factors PPH

METHODS

This analysis used a cross-sectional study Basic Health Research (Riskesdas) 2010 data. Riskesdas sampling followed the National Health Survey (SUSENAS) sampling frame. With a larger number of samples than the National Health Survey, Riskesdas data could better describe the health profile of the districts, cities, or provinces in Indonesia. Riskesdas 2010 provides specific information on the health Millenium Development Goals (MDG) according to the commitment of global health efforts at national level. In addition, it is also a

mean to evaluate the development of several health status of the Indonesian people; changes in health problems; as well as the progress of health development efforts at the national and provincial level in a three-year period.

Some indicators that were collected include nutritional status of children (e.g. starvation); maternal and child health status (e.g., lower child mortality and improved maternal health); the prevalence of malaria and tuberculosis (e.g., decrease morbidity); access to drinking water sources; as well as safety and basic sanitation facilities. Data was collected through interviews and measurements. Laboratory tests for diagnosis of malaria and tuberculosis was performed in the field at the referred public health centers (blood sample for malaria testing and sputum for tuberculosis testing). Riskesdas was approved by the ethical committee of the National Institute of Health Research and Development of the Ministry of Health of the Republic Indonesia.

For this analysis, the subjects consisted of married women **aged 13-49 years,** who gave birth of their last child between January 1, 2005 and August 2010, who had a probability of PPH history. The study consists of 601 subjects with positive PPH history and 19,583 subjects with negative PPH history. In Riskesdas 2010, PPH was defined as bleeding more than two wet pieces materials, 1.5 m each, during giving birth. Independent variables consisted of demographic characteristics (living in urban or rural area, age of the subject in 2010, educational level, employment status, marital status, and economic status). Antenatal, natal and postnatal history characteristics include age at last birth (age of the subject during the last delivery); parity (the number of born children); birth spacing (interval between the last and the previous child), knowledge about pregnancy (danger signs of pregnancy and childbirth), iron tablet consumption during pregnancy, caesarian-section or non-vaginal delivery, eclampsia or eclampsia (characterized by leg swelling, hypertension, and/or seizures), uterine rupture (the incidence of uterine tear during childbirth), the premature rupture of the amniotic sac (amniotic discharge six hours or more before the child was born), placenta previa (the birth canal was blocked by the placenta). The presence of complications during pregnancies and childbirth was confirmed by the health workers. Independent variables were generally dichotomized, except for employment status (i.e., student, housewife; government employee/

army/police; labor/ farmer/ fishermen; and others), age during the last gestation (i.e., 13-19 years, 20-34, and 35-49 years), parity (i.e.1-2 children, 3-5 children, > 5 children or grand multipara), and term of pregnancy (preterm, aterm, post-term).

Analysis was done using logistic regression in Stata 9.0. Independent variables with a statistical significance of p <0.25 were included in the multiple regression analysis. Backward stepwise selection was applied to obtain the final model with a statistical significance level of p <0.05.

RESULTS

Total number of Riskesdas 2010 samples was 91,711 subjects, of which 59,382 were married. Of 19,506 women who had a probability of having post partum

haemorrhage, 18,905 (96.9%) did not have PPH, while 601 (3.1%) did have PPH.

Table 1 reveals that those who had and who did have PPH similarly distributed with respect of residence, marital status, employment status, age birth, and birth spacing. On the sides, those who had higher education, government/army/police employment, low–lowest economic level had higher risk experiencing PPH compared to respective references.

Our final model reveals (Table 2) that PPH related to demographic (education level, and economic level), gynecologic (parity) as well as obstetric eclampsia, premature rupture of the membranes, placenta previa, uterine rupture, and premature or post-term birth] factors.

Table 1. Univariable association between some demographic characteristics and post partum haemorrhage

	No (n=18,905)		Yes (n=601)		Crude odds ratio	95% Confidence interval	P
	n	%	n	%			
Residence							
Urban	9,254	48.9	307	51.1	1.00	Reference	
Rural	9,651	51.1	294	48.9	0.92	0.78–1.08	0.304
Age							
13–19 years	504	2.7	15	2.5	1.00	Reference	
20–34 years	13,363	70.7	412	68.5	1.04	0.61–1.75	0.895
35–49 years	5,038	26.6	174	29.0	1.16	0.68–1.98	0.586
Marital status							
Married	18,806	99.5	598	99.5	1.00	Reference	
Single parent	99	0.5	3	0.5	0.98	0.67–1.44	0.935
Education level							
None	6,926	36.6	186	31.0	1.00	Reference	
Primary–Junior high school	11,583	61.3	395	65.7	1.27	1.06–1.51	0.008
Senior high school – above	396	2.1	20	3.3	1.88	1.17–3.02	0.009
Employment status							
Housewife, student	9,683	51.2	308	51.3	1.00	Reference	
Government, army, police	3,768	20.0	98	16.3	0.82	0.65–1.03	0.087
Labor, farmer, fishermen	3,481	18.4	127	21.1	1.15	0.93–1.42	0.201
Others	1,973	10.4	68	11.3	1.08	0.83–1.42	0.556
Economic level							
Middle–upper	10,179	53.8	303	50.4	1.00	Reference	
Low–lowest	`8,726	46.2	298	49.6	1.15	0.98–1.35	0.097
Age birth							
13–19 years	1,331	7.0	37	6.2	1.00	1.00	
20-34 years	14,328	75.8	455	75.7	1.14	0.81 – 1.61	0.443
35–49 years	3,246	17.2	109	18.1	1.20	0.83 – 1.76	0.328
Birth spacing							
≥ 24 months	17,361	91.8	552	91.8	1.00	1.00	
≤ 23 months	1,544	8.2	49	8.2	0.99	0.74-1.34	0.990

Table 2. Relationship between several gynecologic and obstetric characteristics and post partum haemorrhage

	No (n=18,905)		Yes (n=601)		Adjusted odds ratio*	95% Confidence interval	P
	n	%	n	%			
Eclampsia							
No	18,506	97.9	540	89.9	1.00	Reference	
Yes	399	2.1	61	10.1	3.45	2.53–4.69	0.001
Premature rupture of the membrane							
No	17,872	94.5	510	84.9	1.00	Reference	
Yes	1,033	5.5	91	15.1	2.18	1.69–2.83	0.001
Placenta previa							
No	18,705	98.9	576	95.8	1.00	Reference	
Yes	200	1.1	25	4.2	2.07	1.29–3.31	0.002
Uterine rupture							
No	18,548	98.1	566	94.2	1.00	Reference	
Yes	357	1.9	35	5.8	1.65	1.11–2.46	0.014
Parity							
1–2 children	12,649	66.9	364	60.6	1.00	Reference	
3–5 children	5,506	29.1	198	32.9	1.25	1.03-1.48	0.021
6 or more children	750	4.0	39	6.5	1.81	1.23–2.47	0.002
Birth term							
Aterm	17,698	93.6	525	87.3	1.00	Reference	
Preterm	734	3.9	48	8.0	1.82	1.33–2.49	0.001
Post-term	473	2.5	28	4.7	1.72	1.16–2.57	0.008

*Adjusted each other among risk factors listed on this Table, education level, and economic level

The strongest obstetric factor was eclampsia. Those who had than did not have eclampsia had 3.5-fold experiencing of PPH. Those who had than did not have premature rupture of the membranes had 2.2-fold experiencing PPH. Those who had than did not have placenta previa had 2.1-fold experiencing PPH. In term of uterine rupture, those who had than did not uterine rupture had 65% increase of experiencing PPH. Furthermore, more parities, pre-term as well as post-term birth increased PPH risk.

DISCUSSION

This study shows that pre- or post-term pregnancy, uterine rupture, placenta previa, premature rupture of the membranes, and eclampsia were risk factors of PPH. The operational definition of the study variables, including eclampsia, were not well defined as in hospital-based studies, which could cause selection bias. Second, Riskesdas data were based on recall, which may also cause recall-bias. Nevertheless,

Riskesdas 2010 data is the largest community-based study in Indonesia. It has rich data for evaluating the MDGs, especially in reproductive health.

A review by Jouppila stated that most PPH cases are caused by uterine atony, maternal soft-tissue trauma, retained placenta or its parts, and obstetric coagulopathy.[6] The factors most significantly associated with haemorrhage include advanced maternal age, prolonged labor, eclampsia, obesity of mother, multiple pregnancy, a birth weight of more than 4000g, and previous postpartum haemorrhage.[6] A twenty-year cohort study (1978-1997) by Kramer and colleagues demonstrated that major independent risk factors for PPH included prior Caesarean section, placenta previa or low lying placenta, marginal umbilical cord insertion in the placenta, transverse lie, labour induction and augmentation, uterine or cervical trauma at delivery, and gestational age < 32 weeks.[7] In concordance, in this study we found that multiparity, eclampsia, premature rupture of the membranes and placenta previa were strong risk factors of PPH (OR > 2). We also found that uterine

rupture, pre-term as well as post-term birth increased the risk of PPH.

Eclampsia is a vascular endothelial disorder, which is clinically defined by hypertension and proteinuria, with or without pathologic edema. Eclampsia can range from mild to severe. If uncontrolled, eclampsia could lead to maternal death or cause growth restrictions of the fetus. The 1994 Household Health Survey found the major causes of maternal deaths in Indonesia included haemorrhage, eclampsia, infections, and obstructed labor.[8] Our study revealed that eclampsia was the strongest risk factor of PPH.

We found risk of PPH increased with increasing level of education. An earlier evaluation of the factors influencing complication during delivery in Indonesia using the 2007 IDHS dataset shows that surprisingly breaking of water excessive vaginal bleeding during delivery increased with increasing level of education, qualification of health services, frequency of antenatal care attendance. The risk of these complications was higher respondent lived in urban area compared those who lived in rural area. The author argued that health aspects of health and safe delivery are not included in the subjects of formal education in Indonesia. Therefore, increasing education does not have direct correlation with an increase in knowledge about delivery complications. She also hypothesized that respondents choose better health services for delivery when they experience complications. Data on antenatal care visit shows 78.7% of respondents were very active in attending of antenatal care (more than 4 times) and 21.3 % attended antenatal service less than the recommended three antenatal visits. This might suggest that respondents who though that they had any symptom of complications, visited antenatal care more frequently.[9]

In conclusion, eclampsia was the strongest risk factor of PPH. Other risk factors of PPH included premature rupture of the membranes, placenta previa, premature or post-term pregnancies, and high parity. Our findings imply the need of increasing awareness on health and safe delivery. In particular, early identification and prompt treatment for pregnant women with hypertension by health workers during antenatal case visits.

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