Parity, education level and risk for (pre-) eclampsia in selected hospitals in Jakarta

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Abstrak

Latar belakang: *(Pre-)eklamsi merupakan salah satu faktor risiko kematian tinggi pada ibu hamil. Tujuan penelitian ini untuk mengidentifikasi beberapa faktor risiko terhadap (pre-)eklamsi pada wanita bersalin di rumah sakit (RS) terpilih di Jakarta.*

Metode: *Penelitian potong lintang di dua RS yang dipilih secara purposif di Jakarta. Data berasal dari rekam medik pasien yang melahirkan di RS periode 1 Januari sampai 31 Desember 2011. Analisis data dilakukan dengan menggunakan regresi Cox dengan waktu konstan.*

Hasil: *Sampel yang diperoleh sebanyak 4191 wanita. Subyek yang tidak memiliki data lengkap (usia, status perkawinan, paritas, pendidikan, pekerjaan, dan sumber pendanaan) tidak diikutkan pada analisis sehingga data yang dapat dianalisis sebanyak 1685 sampel.*

Proporsi (pre-)eklamsi ialah 11,5%. Jika dibandingkan dengan primipara, wanita nulipara 78% lebih tinggi berisiko (pre-)eklamsi [risiko relatif suaian (RRa)=1,78; P=0,000]. Selanjutnya, dibandingan dengan wanita yang berpendidikan tinggi, wanita yang berpendidikan rendah 86% lebih banyak berisiko pre-)eklamsi (RRa=1,86; P=0,005), sedangkan wanita yang berpendidikan menengah 72% lebih banyak berisiko (pre-)eklamsi (RRa=1,72; P=0,007).

Kesimpulan: *Wanita nullipara berisiko lebih besar mengalami (pre-)eklamsi daripada primipara dan multipara, begitu pula wanita berpendidikan rendah dan menengah lebih besar berisiko mengalami (pre-) eklamsi daripada wanita berpendidikan tinggi.* ***(Health Science Indones 2013;1:35-9)***

Kata kunci: *paritas, pendidikan (pre-) eklamsi*

Abstract

Background: (Pre-)eclampsia is a common complication in pregnancy associated with high morbidity and mortality in maternal and perinatal. This study aimed to investigate the risk factors for (pre-)eclampsia in selected hospitals in Jakarta.

Methods: This cross-sectional study design was conducted in two selected hospitals in Jakarta during the period of January 1 to December 31, 2011. The collected data came from medical records among women who delivered in the hospitals. The Cox regression with constant time was used to analyze the risks for (pre-)eclampsia.

Results: The 4191 samples were collected from all pregnant woman who delivery in two hospitals. Subjects who did not have complete data (no age, marital status, parity, education, occupations, and funding sources) were excluded, leaving 1685 samples were available for the analysis. The proportion of (pre-)eclampsia in two hospitals was 11.5%. Nulliparous women had 78% greater risk of (pre-)eclampsia compared to primiparous women [adjusted relative risk (RRa) = 1.78; P = 0.000]. Furthermore, women with low education level had 86% greater risk of (pre-)eclampsia (RRa=1.86, P=0.005), while middle education level had 72% greater risk of (pre-)eclampsia (RRa=1.72; P=0.007) compared to high education level.

Conclusion: Nulliparous and low educated women had higher risk of (pre-)eclampsia in selected hospitals in Jakarta. ***(Health Science Indones 2014;1:35-9)***

Key words: parity, education, (pre-) eclampsia

Preeclampsia is defined as hypertension and proteinuria in previously healthy women, that develops after 20th week of gestasion, while eclampsia is diagnosed when the conditions of preeclampsia is accompanied by seizures without any other causes.[1] (Pre-)eclampsia, together with hemorrhage and infection, is one of the deadly triad in pregnancy.[1,2] Preeclampsia is a common complication in pregnancy associated with high maternal morbidity and mortality.[3] (Pre-)eclampsia is also associated with fetal and neonatal deaths.[4] Recently, preeclampsia and other hypertensive disorders in pregnancy have been categorized as a risk factor for cardiovascular diseases in the future.[5] Beside increasing maternal and infant mortality, preeclampsia also increased the economic burden of the country.[6,7]

The incidence of preeclampsia worldwide is 2% to 8% of all pregnancies.[3] The prevalence of preeclampsia in the United States increased from 3.4% in 1980 to 3.8% in 2010.[8] The incidence of eclampsia in the United States in 1998 estimated at 1 per 3250 births.[1]

In Indonesia, the data on preeclampsia-eclampsia is still limited, especially at national level. The incidence of preeclampsia in Indonesia ranges from 3-10%, which account for 39.5% of maternal deaths in 2001, and 55.56% in 2002.[9]

Risk factors associated with (pre-)eclampsia include nulliparity, previous medical history (hypertension, diabetes mellitus and anti-phospholipid syndrome), maternal age >35 years, obesity, physical activity, and diet.[5,10] This study aimed to investigate the risk factors for (pre-)eclampsia in two hospitals in Jakarta.

METHODS

This was a non-interventional and hospital based study with cross-sectional design in one goverment and one private hospital in Jakarta. The data in this study were obtained from all medical records of women who delivered during the period of January 1 to December 31, 2011. Women who delivered with cesarean section and then referred to another hospital for treatment were excluded. Data were transferred/abstracted from medical records to the special questionnaire by trained data collectors.

The data collected were demographic characteristics, gynecologic history, history of comorbidities, history of pregnancy and childbirth. The outcome was (pre-)eclampsia, while the risk factors were age, marital status, parity, education level, maternal occupation,

funding sources, history of antenatal care (ANC), and history of hypertension.

(Pre-)eclampsia was categorized into yes and no (yes = diagnosed as (pre-)eclampsia by professional health workers). Age was grouped into three categories: 16-20, 21-35, and 36-46 years. Marital status was divided into three categories: married, single, and divorced. Parity was grouped into nulliparous (a woman who has never given birth), primiparous (one live birth), and multiparous (two or more live birth). Education level was divided into low (uneducated until completed primary school), middle (completed junior high school), and high (complete senior high school or above). Patient's occupations were divided into 5 categories (military/police/civil servants/state, unemployed/housewife, private employees, entrepreneurs/traders and laborers).

Ante natal care was categorized as regular (frequency ≥ 4 times during pregnancy), irregular (less than 4 times during pregnancy, and unknown (ANC data was not recorded). History of hypertension were grouped into three categories (yes/no/unknown; yes = diagnosed as hypertension by professional health workers). Funding sources were grouped into eight (Jamsostek, Askes/health insurance of goverment employee, private insurance, company, Jampersal, personal expenses, Jamkesmas, Jamkesda).

Data analysis used STATA version 9 with Cox regression model. Ethical approval was obtained from National Institute of Health Research and Development Ethics Committee, Ministry of Health, Republic of Indonesia.

RESULTS

The 4191 samples were collected from all pregnant woman who delivery in two hospitals. Subjects who did not have complete data (no age, marital status, parity, education, occupations, and funding sources) were excluded, leaving 1685 samples were available for the analysis.

Table 1 showed the proportion of (pre-)eclampsia in two hospitals was 11.5% (193/1685). Table 1 also showed that compared with respective reference groups, age 36–46 years, unemployed/housewife, laborer, personal funding, *Jamkesda* funding, and irreguler ANC were more likely to increase risk of (pre-)eclampsia. In addition women who had history of hypertension were 7.1 times more likely to develop (pre-)eclampsia compared to woman who did not have history of hypertension.

Table 1. Some demographic characteristics and risk of (pre-)eclampsia

	No (n=1492)		Yes (n=193)		Crude relative risk	95% Confidence interval	P
	n	%	n	%			
Age years							
21 35 years	1166	89.7	134	10.3	1,00	Reference	
16-20 years	44	91.7	4	8.3	0.81	0.30-2.19	0.675
36-46 years	282	83.7	55	16.3	1.58	1.16-2.17	0.004
Marital status							
Married	1475	88.4	193	11.6	1,00	Reference	
Single	14	100.0	0	0.0	n/a	n/a	n/a
Divorce	3	100.0	0	0.0	n/a	n/a	n/a
Occupations							
Military/police/civil servants/ state	88	96.7	3	3.3	1,00	Reference	
Unemployed/housewife	1015	87.0	152	13.0	3.95	1.26–12,39	0.018
Privat employees	322	92.0	28	8.0	2.43	0.74–7,98	0.144
Enterpreneur/traders	51	89.5	6	10.5	3.19	0.80–12,77	0.101
Laborer	16	80.0	4	20.0	6.07	1.36–27,11	0.018
Antenatal care							
Reguler	656	90.0	73	10.0	1,00	Reference	
Irreguler	72	82.8	15	17.2	1.72	0.99–3.00	0.055
Unknown	764	87.9	105	12.1	1.21	0.90–1.63	0.218
History of hypertension							
No	57	93.4	4	6.6	1.00	Reference	
Yes	145	53.7	125	46.3	7.06	2.61–19.11	0.000
Unknown	1290	95.3	64	4.7	0.72	0.26–1.98	0.525
Funding sources							
Jamsostek	105	97.2	3	2.8	1.00	Reference	
Askes	151	94.4	9	5.6	2.03	0.55–7.48	0.290
Private insurance	39	95.1	2	4.9	1.76	0.29-10.51	0.537
Company	8	100.0	0	0.0	n/a	n/a	n/a
Jampersal	127	93.4	9	6.6	2.38	0.65– 8.80	0.193
Personal expenses	745	87.2	109	12.8	4.59	1.46– 14.47	0.009
Jamkesmas	13	86.7	2	13.3	4.80	0.80–28.72	0.086
Jamkesda	304	83.7	59	16.3	5.85	1.83–18.67	0.003

Tabel 2. Adjusted relatif risk (RRa) for parity and education level of (pre-)eclampsia

	No (n=1492)		Yes (n=193)		Adjusted relative risk	95% Confidence interval	P
	n	%	n	%			
Parity							
Primiparous	580	92,7	46	7.3	1.00	Reference	
Nulliparous	465	85.1	82	14.9	1.78	1.31–2.43	0.000
Multiparous	447	87,3	65	12.7	1.20	0.86-1.68	0.285
Education level							
High	471	95.0	25	5.0	1.00	Reference	
Middle	736	87.5	105	12.5	1.72	1.16–2.55	0.007
Low	285	81.9	63	18.1	1.86	1.21–2.88	0.005

* Adjusted each other between variables listed on this table, age group, ANC, and history of hypertension

Table 2 also showed nulliparous women had 78% greater risk of (pre-)eclampsia compared to primiparous women [adjusted relative risk (RRa)=1.78; P = 0.000]. Furthermore, women with low education level had 86% greater risk of (pre-)eclampsia (RRa=1.86, P=0.005), while middle education level had 72% greater risk of (pre-)eclampsia (RRa=1.72; P=0.007) compared to high education level.

DISCUSSION

This study has several limitations that should be considered. First, this was only performed in two hospitals in Jakarta, second the data was retrospective and extracted from medical records that may raise potential biases and error. The results can not be applied to the general population.

Preeclampsia is often experienced by young and nulliparous women, whereas the older women at risk for having chronic hypertension with superimposed preeclampsia. The incidence of preeclampsia in multiparous was also varied but lower than nulliparaous.[1] This study found that nulliparous women had 1.8 times the risk of (pre-)eclampsia compared to primiparous. These findings were slightly higher than a study by Lee in Taiwan that revealed the relative risk for nulliparaous women was 1.3 times for preeclampsia, and lower than a study by Luealon in Thailand that revealed nulliparity increased the risk of preeclampsia 3.8 times.[11,12] Other studies by Duckitt K and Odegard also revealed nulliparous women had a greater risk of preeclampsia.[7,13] In contrast, a study in India revealed that parity was not found to be associated with preeclampsia.[14] Variations in findings of these studies may be due to the differences in the study design, or the number and type of samples used.

The etiology and pathophysiology of preeclampsia is still not quite understood.[4] The etiology of preeclampsia in the first pregnancy is associated with the role of immunological factors. In the first pregnancy the formation of blocking antibodies against placental antigenic site may be impaired, thu s increases the risk of preeclampsia. Beside the existence of a foreign protein, the fetus or placental agent could evoke an immunological response. An immune response disorders can lead the syndrome of preeclampsia.[1,15]

This study also found that lower educated women had the highest risk of (pre-)eclampsia compared to

high education. This result was similiar to a study by Kiondo that revealed low education had 1.7 times risk of preeclampsia, but lower than a study by Silva which found that low education had 5.1 times risk to develop preeclampsia, and a study by Dinglas that revealed uneducated woman had 7 times the risk of preeclampsia.[16-18]

There was a positive correlation between the level of maternal education and the use of health services.[19] Even in the worse economic and family situations.[20] Furthermore, low education was considered as stressor (with limited costs and decision-making power) that resulted in susceptibility and poor pregnancy and childbirth outcomes.[21] Education has a direct or indirect relationship with maternal deaths. Women with higher education level had the ability to obtain, process, and understand the health information such as ANC, birth spacing, the signs of complications, and nutrition during pregnancy. These women were more confident to ask or discuss with professional health workers. Higher education also increased self-esteem and empowerment for the women in decision-making.[22]

In conclusion, nulliparous and low educated women had higher risk of (pre-)eclampsia in selected hospitals in Jakarta.

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