Conference Paper

Young Mothers, (Pre-)Eclampsia and Other Factors Related to Preterm Birth in Two Hospitals in Jakarta

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Abstract

Based on WHO data, the preterm birth rate in Indonesia in 2010 is 15.5 per 100 live births. Preterm birth is one of death leading cause in children under five years old because it can lead to severe complications. This study aimed to identify several factors related to preterm birth. The cross-sectional study was conducted in two selected hospitals in Jakarta from January 1st through December 31st, 2011. Data collected from medical records among women who delivered in those hospitals. The analysis performed by using multivariate logistic regression. This study collected 4191 samples. Eight hundred five examples were included in this analysis while remain samples excluded due to incomplete data records and post-term birth. The prevalence of preterm delivery in two hospitals was 14.84%. Compared to women in 20-34 years age group, a young mother with aged 17-20 years old had 3.37 fold higher chance to have preterm birth [adjusted odds ratio (ORa)=3.37; p=0.018].

Meanwhile, mothers with (pre-)eclampsia had 3.76 fold higher chance to have a preterm birth (ORa=3.76; p=0.0005). Furthermore, women with antepartum hemorrhage had a higher chance to have a preterm birth (ORa=12.52; p= 0.0005). A young mother, women who work in military/policy/civil servants/ state, (pre-)eclampsia mother, and mother with antepartum hemorrhage had a higher risk of preterm birth in selected hospitals in Jakarta.

Keywords: a young mother, (pre-)eclampsia, antepartum hemorrhage, preterm birth

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Received: 21 December 2018
Accepted: 23 January 2019
Published: 28 February 2019

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the 3rd IMOPH & the 1st YSSOPH Conference Committee.

1. Introduction

Based on WHO data, 15 million babies are born preterm, and the rates are increasing in almost all countries [1]. Based on estimation in 2010, Indonesia occupies the fifth position of preterm birth rate in the world (15.5%). Prematurity is not just a problem of developing countries only; data showed that developed countries like America occupy the sixth position after Indonesia in preterm birth rate [2].

Prematurity is the second leading cause of death in toddlers after pneumonia and the leading cause of neonatal mortality [1]. The previous study in Cameroon showed that 36.6% of preterm babies died due to infections, asphyxia, and congenital

malformation [3]. Preterm birth has a great influence on neonatal mortalities and chronic morbidities. Compared to term infants, preterm delivery has a higher risk of temperature instability, respiratory distress, infections, apnea, hypoglycemia, seizures, jaundice, kernicterus, feeding difficulties, necrotizing enterocolitis, and rehospitalizations [4].

Preterm birth involves multiple pathological processes, including infection/inflammation, ischemia, uterine overdistension, cervical disease, endocrine disorder, and other means [5, 6]. Further study showed that maternal race, low-socioeconomic status, maternal weight, smoking also affects preterm birth [7, 8]

In Indonesia, the previous study reported that age of mothers, level of education, history of miscarriage, antenatal care, and (pre-)eclampsia are related to the risk of preterm birth [9, 10]. This study aimed to identify several factors related to preterm delivery.

2. Methods

The cross-sectional study conducted in one government hospital and one private hospital in Jakarta. Data collected from medical records among women who were delivered in those hospitals from Jathe January 1st through December 31st, 2011.

Exclusion criteria from the study were patients with deliveries who referred to another hospital — the data extracted by using a structured questionnaire including subject characteristics, history of pregnancy, and distribution. The dependent variable of this study was preterm birth. Meanwhile, independent variables were mother's age, level of education, occupations, anemia, antenatal care, (pre-)eclampsia, and antepartum hemorrhage.

Preterm birth defined as babies born less than 37 weeks of gestation [11]. This term determined by professional health workers. Age of mother grouped into three category: 20-34 years, 17-20 years, and 35-46 years. Level of education categorized into three groups: high (completed senior high school or more), middle (completed junior high school), and low (uneducated up to completed primary school). Mother's occupation divided into five categories: unemployed/housewives, military/police/civil servants/state, private employees, entrepreneurs/traders, laborer.

Anemia was defined as hemoglobin levels less than 10.9 g/dl in pregnant women according to WHO which was grouped into yes and no (diagnosed by professional health workers) [12]. Antenatal care divided into three categories: regular (frequency $\geq$ four times during pregnancy), irregular (less than four times during pregnancy), and never.

Preeclampsia defined as a syndrome that occurs explicitly in pregnant women signed with hypertension with proteinuria that can affect virtually every organ system, whereas eclampsia is preeclampsia with convulsion without another cause [13]. (Pre-)eclampsia is divided into "yes" and "no" (diagnosed by professional health workers).

Antepartum hemorrhage defined as vaginal bleeding that occurs during the first half of pregnancy until delivery [13]. It is categorized into "yes" and "no' (diagnosed by professional health workers).

Several factors related to preterm birth identified by using Chi-square, univariate, multivariate logistic regression.

3. Results

Total samples for this study was 4191 subjects. Only 805 examples were eligible while the remains excluded due to incomplete data records and post-term birth.

Table 1 shows the prevalence of preterm birth among preterm birth and term birth was 12.9% (104/805). Mothers who did preterm birth and term birth similarly distributed to education level, anemia status, and antenatal care. Compared to the reference group, (pre-) eclampsia, and antepartum hemorrhage were more likely to had a higher risk of preterm birth.

Table 2 shows that compared to women in 20-34 years age group, a young mother with aged 17-20 years old had 3.37 fold higher chance to have preterm birth [adjusted odds ratio (ORa)=3.37; p=0.018]. Meanwhile, mothers with (pre-)eclampsia had 3.76 fold higher chance to have a preterm birth (ORa=3.76; p=0.0005). Furthermore, women with antepartum hemorrhage had a higher chance to have a preterm birth (ORa=12.52; p= 0.0005). Otherwise, the risk of mother's occupation was not statistically different among each group.

4. Discussion

This study has several limitations that should consider. The data was a retrospective data derived from medical records from two hospitals in Jakarta that may raise potential biases and error. The result cannot be applied generally in population.

This study found that the prevalence of preterm birth was 12.9%. These findings were lower than previous research stating that the incidence of preterm delivery in Indonesia was 36.4% [9]. Nevertheless, this prevalence is higher than the study in Iran which found 5.1% [14]. Variation in results could influence by different methodologies, sample size, and the setting where the study took place.

The etiology and pathophysiology of preterm birth are still incompletely understood. Preterm birth is not a single pathological process but a result of multifactorial etiologies, such as gestational age, ethnicity, and characteristics for each population [15].

In the present study, we found that young mother had a three-fold higher risk of preterm birth. This finding was also similar with another previous study in Thailand which revealed that young mother aged <20 years had 2 -3 fold higher risk of preterm birth than mother aged 20-34 years [16, 17]. Briggs et al. also showed that young mothers were more likely to have a preterm delivery [18]. A young mother has a higher risk of anemia, preterm birth, and pregnancy-induced hypertension [19]. Several studies reported that preterm birth is more common in young mother that also associated with a low socioeconomic status which also related to inadequate antenatal care [20, 21]. Although adequacy of prenatal care in this study assessed, after adjusted with another factor, it

Table 1: Several demographic factors and risk of preterm birth.

Variables	Birth						
	Term		Preterm		Crude relative risk	95% Confidence interval	p
	(n=701)		(n=104)				
	n	%	n	%			
Age groups							
20-34 years	521	87.9	72	12.1	1.00	Reference	
17-20 years	12	60.0	8	40.0	4.82	1.91-12.2	0.001
35-46 years	168	87.5	24	12.5	1.03	0.63-1.69	0.895
Level of education							
High	560	87.4	81	12.6	1.00	Reference	
Middle	86	89.6	10	10.4	1.63	0.40-1.61	0.538
Low	55	80.9	13	19.1	0.15	0.86-3.12	0.137
Occupations							
Unemployed/housewives	446	84.5	82	15.5	1.00	Reference	
Military/police/civil servants/state	51	98.1	1	1.9	0.11	0.02-0.78	0.028
Private employees	167	91.3	16	8.7	0.52	0.30-0.92	0.024
Entrepreneurs/traders	27	90.0	3	10.0	0.60	0.18-2.04	0.417
Laborer	10	83.3	2	16.7	1.09	0.23-5.06	0.914
Anemia							
No	455	87.2	67	12.8	1.00	Reference	
Yes	246	86.9	37	13.1	1.02	0.66-1.57	0.923
Antenatal care							
Regular	560	88.7	71	11.3	1.00	Reference	
Irregular	64	81.0	15	19.0	1.85	1.00-3.41	0.050
Never	77	81.1	18	18.9	1.84	1.04-3.26	0.035
(Pre-)eclampsia							
No	637	89.3	76	10.7	1.00	Reference	
Yes	64	69.6	28	30.4	3.67	2.22-6.07	0.0005
Antepartum hemorrhage							
No	697	87.8	97	12.2	1.00	Reference	
Yes	4	36.4	7	63.6	12.58	3.62-43.75	0.0005

seems not statistically significant to preterm birth. The difference is probably due to this study consist of a young mother with a higher prevalence of antepartum hemorrhage.

In this study, the risk of the mother's occupation was not statistically different among each group. Otherwise, another study showed that pregnant women workers had a 20 to 60 percent higher rates of preterm birth and fivefold risk of preeclampsia. Fatigue work increased the risk of preterm premature membrane rupture [13]. The difference was probably due to this study consisting of young mothers with a higher prevalence of antepartum hemorrhage.

Table 2: Dominant factors related to preterm birth.

Variables	Birth					95% Confidence interval	
	Term		Preterm		Adjusted Odds ratio		p
	(n=701)		(n=104)				
	n	%	n	%			
Age groups							
20-34 years	521	87.9	72	12.1	Reference	Reference	
17-20 years	12	60.0	8	40.0	3.37	1.23-9.25	0.018
35-46 years	168	87.5	24	12.5	1.00	0.60-1.68	0.996
Occupations							
Unemployed/housewives	446	84.5	82	15.5	Reference	Reference	
Military/police/civil servants/state	51	98.1	1	1.9	0.14	0.02-1.05	0.055
Private employees	167	91.3	16	8.7	0.61	0.34-1.10	0.100
Entrepreneurs/traders	27	90.0	3	10.0	0.72	0.21-2.47	0.599
Laborer	10	83.3	2	16.7	0.74	0.14-3.91	0.723
(Pre-)eclampsia							
No	637	89.3	76	10.7	Reference	Reference	
Yes	64	69.6	28	30.4	3.76	2.24-6.31	0.0005
Antepartum hemorrhage							
No	697	87.8	97	12.2	Reference	Reference	
Yes	4	36.4	7	63.6	12.52	3.43-45.71	0.0005

In the US, hemorrhage, preeclampsia, and infection is the leading causes of death in pregnancy [13]. Our study showed that mothers with (pre-)eclampsia had 3.76 fold higher risk of preterm birth. Similarly, Ananth et al. in Canada indicated that women with severe preeclampsia had eightfold higher chance and study in Iran also demonstrated a 3.6 fold higher likelihood of preterm birth [14, 22]. Preeclampsia is a complex and multifactorial disorder that causes preterm delivery and uteroplacental insufficiency which induce impaired blood flow to the fetus [23]. Oligohydramnios that cause maternal complications such as preeclampsia increase the risk of preterm birth 3-10 times [13, 24]

Antenatal hemorrhage increased the odds of preterm labor. The previous study in Thailand also identified that antenatal hemorrhage increased the risk of preterm birth two-fold higher [25]. Vaginal bleeding induced preterm delivery due to fetal or maternal emergencies [14].

5. Conclusions

In conclusion, young mothers, mothers with (pre-)eclampsia, and mothers with antepartum hemorrhage had a higher risk to have a preterm birth. WHO has made many strategies to prevent preterm delivery such as family planning, increased

empowerment of women, and quality improvement in pregnancy care [1]. Further research efforts in strategy innovation are needed to prevent preterm birth and to save premature babies.

Acknowledgment

The authors wish to thank the Board of Health Research and Development, Ministry of Health, the Republic of Indonesia for data support.

Ethical Approval

Ethical approval obtained from the National Institute for Health Research and Development Ethics Committee, Ministry of Health, Republic of Indonesia.

Competing Interest

The author declares that there is no conflict of interest.

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