

Young mothers, parity and the risks of anemia in the third trimester of pregnancy

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Abstrak

Latar belakang: anemia masih menjadi masalah kesehatan di Indonesia. Berdasarkan hasil riskesdas tahun 2007-2013, prevalensi anemia pada wanita hamil cenderung meningkat. Pada tulisan ini disajikan beberapa faktor risiko yang berkaitan dengan kejadian anemia pada wanita hamil trimester ketiga.

Metode: Penelitian potong lintang yang dilaksanakan di dua Rumah Sakit di Jakarta. Data diambil dari rekam medik wanita hamil yang melahirkan di RS pada periode 1 Januari sampai 31 Desember 2011. Analisis data dilakukan dengan menggunakan regresi Cox dengan waktu konstan.

Hasil: dari total 4191 sampel sebanyak 1202 yang memiliki data lengkap diikutkan dalam analisis. Prevalensi anemia pada wanita hamil trimester ketiga adalah 33,7%. Jika dibandingkan wanita hamil usia 21-35 tahun, hamil pada usia muda (16-21 tahun) 56% lebih tinggi berisiko menderita anemia [risiko relatif suaian (RRa) = 1,56; P = 0,000], sedangkan hamil pada usia tua (36-46 tahun) memiliki risiko yang sama dengan usia 21-35 tahun (RRa = 0,91; P = 0,350). Selanjutnya, jika dibandingkan dengan wanita nullipara, wanita multipara 58% lebih tinggi berisiko menderita anemia [RRa=1,58; P = 0,000], sedangkan wanita primipara memiliki risiko yang sama dengan nullipara (RRa = 1,15; P = 0,201).

Kesimpulan: Anemia pada wanita hamil trimester ketiga lebih sering ditemukan pada wanita hamil yang berusia muda dengan multipara. (*Health Science Journal of Indonesia 2015;1:7-11*)

Kata kunci: usia muda, multipara, anemia dalam kehamilan

Abstract

Background: Anemia during pregnancy remains a major health problem in Indonesia. According to the Indonesian basic health research in 2007-2013, the prevalence of anemia in pregnancy tends to increase. This paper aimed to assess the risk factors related to anemia in the third trimester of gestation.

Methods: This cross-sectional study was carried out in one government hospital and one private hospital in Jakarta. All medical records of pregnant women who gave birth between January 1 to December 31 of 2011 were included. The Cox regression with constant time was used to analyze the risks of anemia.

Results: This study collected 4191 samples in two hospitals. Eligible samples for analysis were 1202 while the remainings were excluded due to incomplete data records. The prevalence of anemia among pregnant women in the third trimester was 33.7%. Compared to women in the 21-35 year age group, those with aged 16-20 years had 56% higher risk to be anemic [adjusted relative risk (RRa) = 1.56; P = 0.014], however, those with aged 36-46 years had the same risk to be anemic (P = 0.350). In term of parity, compared with nulliparous, multiparous women had 58% higher risk to be anemic (RRa = 1.58; P = 0.000), however, primiparous women had moderately higher risk to be anemic (RRa = 1.15; P = 0.201).

Conclusion: Anemia in the third trimester of pregnancy were more common among young and multiparous mothers. (*Health Science Journal of Indonesia 2015;1:7-11*)

Keywords: young mothers, multiparous, anemia in pregnancy

Anemia during pregnancy remains a major health problem in Indonesia. According to the Indonesian basic health research, the prevalence of anemia among pregnant women was considerably increased from 24.5% in 2007 to 37.1% in 2013.^{1,2} Based on the WHO estimation, the prevalence of anemia among pregnant women in South East Asia is 48.2%.³

Anemia during pregnancy has various effects on maternal and fetal growth.⁴ The previous study showed effects of anemia during pregnancy in the third trimester. The effects include small for gestation age, low birth weight, preterm delivery, uterine inertia, postpartum hemorrhage, prolonged labour, disseminated intravascular coagulation and foetal distress.⁴⁻⁷

Apart from iron and folic acid deficiency, other factors contributing to the occurrence of anemia include dietary habits, sociodemographic, economic status, parity, an interval between pregnancies, gravidity and abortion. Further study also found malaria, intestinal parasites such as hookworms, increased the risk of anemia.⁸⁻⁹

In Indonesia, The previous study reported that low iron stores are the highest prevalence among pregnant women in the third trimester.¹⁰ Several factors are associated with the risk of anemia in Indonesia including intestinal helminth infection,¹⁰ level of education, antenatal iron supplementation, and length of gestation.¹¹ Unfortunately, most of the studies have been conducted more than a decade ago. This paper aimed to assess the risk factors related to anemia in the third trimester of pregnancy.

METHODS

This cross-sectional study was carried out in one government hospital and one private hospital in Jakarta. The samples were selected by using purposive sampling technique. All medical records of pregnant women who gave birth between January 1 to December 31 of 2011 were included, among those who delivered in the hospitals then referred to other hospitals for following treatment were excluded.

The data were extracted from medical records using structured questionnaire which contains demographic characteristics (age, education, occupation, marital status, funding sources), history of pregnancy and delivery (gravidity, parity, antenatal care follow-up, iron supplementation, and others).

The outcome of this study was anemia. Risk factors assessed in this study were maternal age, education

level, marital status, maternal occupations, funding sources, antenatal care (ANC), maternal iron intake, gravidity, parity and antepartum haemorrhage.

Anemia was defined as hemoglobin (Hb) concentration less than 11 g/dl according to WHO recommendation³ which was measured when the patients were admitted to the hospital.

Maternal age was categorized into three subgroups (16-20 years, 21-35 years, 36-46 years). Maternal education level was divided into (low (no schooling to primary school), middle (junior high school), and high (senior high school or more). Marital status was classified into three subgroups (married, single and divorced). Maternal occupations were divided into 5 categories (military/police/civil servants/state, unemployed/housewife, private employees, entrepreneurs/traders and laborer). Funding sources were categorized as civil servants insurance (provided by *Askes*), company (*Jamsostek* or other company insurances), social health insurance (*Jamkesmas*, *Jamkesda*, or *Jampersal*), private insurances and out of pocket payment.

Antenatal care categorized as a regular (frequency ≥ 4 times during pregnancy), irregular (less than four times during pregnancy and unknown (ANC data was not recorded). Iron supplementation was categorized into yes and no. Gravidity was classified into primigravida (first pregnancy), multigravida (has been pregnant two to four times), grand multigravida (has been pregnant five times or more). Parity was grouped into three subgroups (nulliparous = a woman who has never given birth, primiparous = number of live birth is one, multiparous = number of live birth is two or more). Antepartum hemorrhage was defined as any vaginal bleeding from the 20th week of gestation until delivery,¹² which was divided into yes and no (yes = diagnosed as antepartum hemorrhage by professional health workers).

Cox regression analysis was used to analyze the data using STATA version 9. Ethical approval was obtained from National Institute for Health Research and Development Ethics Committee, Ministry of Health, Republic of Indonesia.

RESULTS

A total of 4191 samples had been collected in two hospitals. Eligible samples for analysis were 1202 while the remaining were excluded due to incomplete data records.

Table 1 shows the prevalence of anemia among pregnant women in the third trimester was 33.7%

(405/1202). Those who had anemia and did not have anemia were similarly distributed with respect to maternal education level, history of antenatal care, iron supplementation and history of abortion. Compared to the respective reference groups, those who having single status, unemployed/housewife, funded by social health insurance, company and out of pocket, grand multigravida, and experienced antepartum haemorrhage were more likely to had higher risk to be anemic.

Table 2 shows that compared to women in the 21-35 year age group, those with aged 16-20 years had 56% higher risk to be anemic ($P = 0.014$). However, those with aged 36-46 years had the same risk to be anemic ($P = 0.350$). In term of parity, compared with nulliparous, multiparous women had 58% higher risk to be anemic ($P = 0.000$), however, primiparous women had moderately higher risk to be anemic ($P = 0.201$).

Table 1. Profile of sociodemographic characteristics, clinical features and risk of anemia

Variable	Anemia				Crude relative risk	95% confidence interval	P
	No (n=797)		Yes (n=405)				
	n	%	n	%			
Level of education							
High	244	68.5	112	31.5	1.00	Reference	
Middle	392	64.9	212	35.1	1.12	0.89 – 1.40	0.349
Low	161	66.5	81	33.5	1.06	0.80 – 1.42	0.671
Marital status							
Married	795	66.4	402	33.6	1.00	Reference	
Single	0	0.0	2	100.0	2.98	0.74 – 11.95	0.124
Divorce	2	66.7	1	33.3	0.99	0.14 – 7.06	0.994
Occupations							
Military/police/civil servants/state	58	75.3	19	24.7	1.00	Reference	
Unemployed/housewife	521	64.2	290	35.8	1.45	0.91 - 2.31	0.117
Private employees	179	69.6	78	30.4	1.23	0.74 - 2.03	0.418
Entrepreneur/traders	29	65.9	15	34.1	1.38	0.70 - 2.72	0.349
Laborer	10	76.9	3	23.1	0.94	0.28 – 3.16	0.914
Funding sources							
Civil servants insurance	108	74.0	38	26.0	1.00	Reference	
Company insurance	70	62.5	42	37.5	1.44	0.93 – 2.23	0.103
Social health insurance	235	65.8	122	34.2	1.31	0.91 – 1.89	0.143
Private insurance	12	60.0	8	40.0	1.54	0.72 – 3.29	0.269
Out of pocket	372	65.6	195	34.4	1.32	0.93 – 1.87	0.116
Antenatal care							
Regular	299	65.1	160	34.9	1.00	Reference	
Irregular	31	63.3	18	36.7	1.05	0.65 – 1.72	0.833
Unknown	467	67.3	227	32.7	0.94	0.77 – 1.15	0.538
Iron intake							
Yes	764	66.6	383	33.4	1.00	Reference	
No	33	60.0	22	40.0	1.20	0.78 – 1.84	0.410
Gravidity							
Primigravide	246	70.5	103	29.5	1.00	Reference	
Multigravide	542	65.1	291	34.9	1.18	0.95 - 1.48	0.141
Grand multigravide	9	45.0	11	55.0	1.86	1.00 - 3.74	0.050
Antepartum haemorrhage							
No	767	67.6	367	32.4	1.00	Reference	
Yes	30	44.1	38	55.9	1.73	1.23 - 2.41	0.001

Tabel 2. Dominant risk factors related to anemia in the third trimester

Variable	Anemia				Adjusted relative risk*	95% confidence interval	P
	No (n=797)		Yes (n=405)				
	n	%	n	%			
Age groups (years)							
21 - 35	619	67.1	304	32.9	1.00	Reference	-
16- 20	20	54.1	17	45.9	1.56	1.09 - 2.21	0.014
36 – 46	158	65.3	84	34.7	0.91	0.74 - 1.11	0.350
Parity							
Nulliparous	276	71.0	113	29.0	1.00	Reference	
Primiparous	311	69.0	140	31.0	1.15	0.93 – 1.42	0.201
Multiparous	210	58.0	152	42.0	1.58	1.28 – 1.95	0.000

*Adjusted each other between variables listed in this table and antepartum hemorrhage

DISCUSSION

Since this study used data derived from medical records, there were several limitations such as the eligible samples for analysis were 1202 out of 4191 records. We did not have information regarding in Hb level prior to pregnancy, the number and duration of iron supplementation, dietary habits, and nutritional status during pregnancy that related to the risk of anemia.

This study found the prevalence of anemia among third trimester of pregnant women were 33.7%. This finding was lower than previous studies which revealed that the prevalence of anemia in the third trimester of pregnancy was 46.6% in Bali, as well as 43% of pregnant women in the third trimester were anemic in Malaysia.^{11,13} However, the prevalence rate was slightly higher than the study in Uganda who found 32.5% of those were anemic¹⁴ The different of methodologies, sample size, various methods of blood taking and examination, and the setting where the study was conducted could influence the results.

Our study demonstrated that young mothers had 56% higher risk of anemia. Similarly, Barroso et al. in the UK found that the likelihood of anemia was 96% higher in young mothers.¹⁵ As well as Briggs et al. stated that adolescents (≤ 19 years) were 2.5 times more likely to be anemic than adults at pre-delivery.⁶ However, Noronha et al. reported that maternal age was not significantly associated with the risk of anemia.⁹ Ononge et al. also stated that maternal age showed a weak association with anemia in pregnancy.¹⁴ The difference is probably due to our study contained young mothers who were more likely to had a higher prevalence of antepartum hemorrhage. A previous study reported adolescents (women ≤ 19 years old) have significantly lower plasma ferritin and body iron stores compared to

adult¹⁶ which may increased the risk of anemia in pregnancy. Many adolescents may begin a pregnancy with low iron store because of poor dietary iron intakes and/or growth demands.¹⁷

This study also suggested multiparous women had 58% higher risk of anemia than nulliparous. This result seemed lower compared to study of Al Farsi et al. who stated the risk of anemia in pregnancy among the high parity (≥ 5) was 3 times greater than those among the lower parity¹⁸ and Nwizu et al also reported the risk of anemia was 2 times higher among those who had high parity.⁸ Uche-Nwachi et al found risk of anemia was 1.7 times higher among women with at least one previous birth.¹⁹ Pregnancy, delivery, and breastfeeding repeatedly will decrease the level of various micronutrients, particularly iron stores.²⁰ The failure of replacement iron depletion in previous pregnancy may raise the frequency and severity of anemia in multiparous women.²¹

In conclusion, anemia in the third trimester of pregnancy was more common among young and multiparous mothers.

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