

The Prevalence of Anemia in Pregnant Women in the 10 Priority Villages for Stunting Control in Sumedang District, West Java: A Community-based Survey

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The Prevalence of Anemia in Pregnant Women in the 10 Priority Villages for Stunting Control in Sumedang District, West Java: A Community-based Survey

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Abstract

Background: Anemia in pregnant women possessed potential harm to mother and child. There were 48.9% of pregnant women suffering from anemia and 40% of women of childbearing age also suffer from anemia. Incidence of anemia among pregnant women are prominent health problems especially in developing countries such as Indonesia. **Aims and objectives:** To determine the prevalence of anemia among pregnant women in relation to infection of Soil Transmitted Helminthes (STH) and Serum Iron deficiency in 10 priority villages for stunting control set by the government in Sumedang District, West Java. **Method and materials:** This is a community-based survey. In this study Hemoglobin concentration was obtained from fingerprick blood test. Containers for stool specimens and anal swabs were given to each woman at the time of hemoglobin fingerpick blood test showed positive results for anemia. Data were analyzed using SPSS Software and a descriptive statistics were applied. **Results:** Out of 209 pregnant women examined we found 39 Pregnant Women (18.7%) suffering from anemia. Followed by Serum Iron analysis we found 23.3% of the total number of pregnant women with iron deficiency. On microscopic examination of fecal specimens and anal swabs we found no worm eggs or larvae in the specimens examined. **Conclusion:** In District of Sumedang Hemoglobin examination found that there were 18.7% pregnant women with anemia and 23.3% suffering Iron deficiency. All (100%) pregnant women were categorized as mild anemia according to severity assessment of anemia. Microscopic examination of fecal samples and anal swabs in pregnant women with anemia showed neither STH eggs nor larvae.

Keywords: Pregnant Women, Anemia Status, Soil Transmitted Helminthes, Serum Iron, Stunting, Rural Areas Sumedang.

Introduction

The direct cause of maternal mortality in Indonesia is due to hemorrhage, infection and eclampsia, while indirect causes are anemia. Anemia in pregnant women possessed potential harm to mother and child. The maternal mortality ratio in Indonesia is 305/100,000 live births.(9). In addition, according to "Basic Health Research" there were 48.9% pregnant women suffer from anemia and 40% of women of childbearing age suffered as well.(24). Infectious and parasitic diseases are prominent health problems, especially in developing countries such as Indonesia. Helminthes infections are disease that is typical found in the tropics, sub-tropics and usually increases during the rainy season. Indonesia is one of the countries that meet these criteria, so we could say that helminthes distribution in Indonesia is partly contributed by our country geographical states. Soil transmitted helminthes in Indonesia have high prevalence, especially in rural areas where the environmental conditions are very supportive for the development of helminthes and their life cycle within the soil.(1). Chronic STH infection would lead to anemia due to iron chelation and insidious bleeding. In Indonesia, Asia Development Bank (ADB) stated that on 2012 as many as 22 million Indonesian children suffered from anemia which in turn caused decrease in IQ.(2). STH infection and anemia were closely related. In this research, therefore, we ought to study on distribution of both anemia and soil transmitted helminthes infection among pregnant women.

Aims and Objectives

To asses the prevalence of Anemia of pregnant women in relation to infection of soil transmitted helminthes (STH) and serum iron deficiency in 10 priority villages for stunting control set by the government in Sumedang District, West Java.

Materials and Methods

Study Type: A community-based, Cross sectional study. **Study Population:** Pregnant women. **Study Area:** in 10 priority villages of stunting of Sumedang District, namely the villages of Mekar Sari, Mekar Bakti, Margamukti, Cilembu, Cijeruk, Cimarga, Ungkal, Sukahayu, Kebon Kalapa, and Malaka. The inclusion criteria were pregnant women within these villages; any trimester of pregnancy; Samples were collected on specific dates for every villages. Recruitment also included canvassing (door-to-door approached) in neighborhoods in the more rural catchment areas because it was known that some of the

pregnant women worked on day time. **Study Duration:** 10 days. **Sample Size:** All pregnant women in the population (n=209) are included in the study. **Exclusion Criteria:** Not readily to sign informed consent form; unwilling to provide sample (hemoglobin, fecal specimen, anal swab); Women who underwent abortion and labor also excluded from the study. **Data Collection:** Aside the physical and laboratories examination, the questionnaires is used to obtained demographic data. Hemoglobin concentration was obtained from fingerprick blood test using Easy-Touch® assessment. Anemia was diagnosed when the Hb result were <11.0mg/dL at first and third trimester, <10.5 mg/dL at second trimester. As many as 48 trained young doctors were deployed to check anemia status. Pregnant women who have low Hb then proceed with an Iron Serum examination. For the measurement of STH infection, containers for stool specimens and anal swabs were given to each woman at the time of hemoglobin fingerpick blood test showed positive results for anemia. Women were asked to return the next day with the fecal sample. The fecal samples were examined on the same day they were returned by researchers under supervision of well-trained laboratory analyst. Fecal samples used 2% of Eosin as reagent, anal swab samples used toluene as reagent. Both samples were examined under light microscope under 10x and 40x magnification. Quality control measures (e.g., daily supervision, re-reading of negative slides and external evaluator) were strictly enforced. Diagnosis of STH infection were confirmed when either helminthes' larva or eggs were found. **Statistical Analysis:** Data processing includes editing, coding, data tabulation of the prevalence measured in percentage using SPSS Software.

3. Results

As it showed in table 1 below, based on the demographic data obtained of 209 pregnant women we found that in 10 villages of priority control of stunting in Sumedang District most pregnant women are in the age range of 16-25 years (50.7%) and 26-35 (40.2%). The age range of marriage in pregnant women is most commonly found at the age of 17-20 years. The level of education, the majority had junior high school education (44.5%) whereas almost all (96.7%) as housewives (96.7%). The highest number of family members is found in the range of 3-5 people (60.8%). The average family income is found in the range of Rp. 1,000,000 to Rp.2,000,000 (58.4%).

Table 1. Demographic data of pregnant women in the 10 priority villages for Stunting prevention in Sumedang District

Variabel	Frequency	Percentage (%)
Age		
<15 y.o	1	0,5
16-25y.o	106	50,7
26-35y.o	84	40,2
36-45y.o	18	8,6
Marital Age		
<13 y.o	2	1,0
13-16 y.o	46	22,0
17-20 y.o	111	53,1
21-24 y.o	30	14,4
25-28, y.o	11	5,3
29-32 y.o	5	2,4
33-35 y.o	3	1,4
>35 y.o	1	5,0
Level of Education		
Elementary	54	25,8
Junior High School	93	44,5
High School	54	25,8
University	8	3,8
Occupation		
Housewife	202	96,7
Entrepreneur	3	1,4
Employee	4	1,9
No. of Family Member		
2 person	67	32,1
3-5 person	127	60,8
>5 person	15	7,2
Family Income		
Rp,<1,000,000	40	19,1
Rp,1,000,000- 2,000,000	122	58,4
Rp,>2,000,000-3,000,000	35	16,7
Rp,>3,000,000	12	5,7

Clinically, as shown in the tables 2 and 3 we found that the most gestational age of mothers based on the trimester of pregnancy in the second trimester (15-28 weeks) which was 47.4%. Based on GPA status, most were found in gravida 2 (43.1%), parity 1 (42.6%), no abortion was 90.0%. On specific physical examination of anemia we found anemic conjunctiva (16.7%), pale lip mucosa (6.7%), koilonikia nails (3.8%). On hemoglobin examination with a quick test found 18.7% of pregnant women had anemia. From Serum Iron (SI) tested we found the majority had normal SI levels with a total of 76.5%), and only 23.3% had low SI levels. The results of microscopic examination of faeces and anal swabs on STH infection in pregnant women showed negative results in all pregnant women with anemia.

Tabel 2. Pregnancy status and specific physical examination

	Frequency	Percentage (%)
Pregnancy Age		
Trimester1	43	20,6
Trimester2	99	47,4
Trimester3	67	32,1
Gravid		
1	76	36,4
2	90	43,1
3	27	12,9
4	12	5,7
5	1	0,5
>5	3	1,4
Parity		
0	85	40,7
1	89	42,6
2	22	10,5
3	12	5,7
4	0	0,0
≥5	1	0,5
Abortus		
0	188	90,0
1	15	7,2
2	5	2,4
3	1	0,5
4	0	0
≥5	0	1
Abortus		
0	34	15,4
1	3	1,2
2	2	0,9

3	0	1
Conjunctival Anemia		
Yes	17	18
No	22	152
Pale Lips Mucosal		
Yes	10	4
No	29	166
Koilonychias		
Yes	7	1
No	32	169

Table 3 . Anemia status and Microscopic fecal & Anal swab on STH Infection, and Serum Iron Examination

AnemiaStatus	Frequency	Percentage (%)
Anemia (+)	39	18,7
Anemia(-)	170	81,3
Microscopic fecal examination & Anal swab on STH Infection		
Negative	39	18,7
Not Examined		81,3
Severity Assesment of Anemia (WHO, 2011)		
Mild	39	-
Moderate	0	-
Severe	0	-
Anemia status and Deficiency of Fe		
Low serum iron	7	23,3
Normal serum Iron	23	76,7

From the cross-tabulation in table 4 we found 25 mothers with an age range of 16-25 years suffering from anemia, 16 and 17 mothers were found suffered anemia in the marriage age group 13-16 years and 17-20 years respectively. As many as 27 pregnant women in the family income group of Rp.1,000,000 - Rp.2,000,000 suffered from anemia, and anemia rates are higher in mothers with primigravida status (G1P0A0).

Tabel 4. Cross-Tabulation data of Anemia Status according to variables

	Anemia (+)	Anemia ((-)
Age		
<15	0	1
16-25	25	81

26-35	11	73
36-45	3	15
Marital Age		
<13, y.o	0	2
13-16 y.o	16	30
17-20 y.o	17	94
21-24 y.o	4	26
25-28 y.o	1	10
29-32 y.o	1	4
33-35 y.o	0	3
>35y.o	0	1
Level of Education		
Elementary	9	45
Junior High	26	67
High School	4	50
University	0	8
Occupation		
Housewife	38	164
Entrepreneur	0	3
Employee	1	3
Family Income		
Rp.<1.000.000	4	36
Rp.1.000.001-2.000.000	27	95
Rp.2.000.001-3.000.000	4	31
Rp.>3.000.000	4	8
PregnancyAge		
Trimester1	7	37
Trimester2	16	82
Trimester3	16	51
Gravid		
1	17	59
2	14	76
3	4	23
4	2	10
5	1	0
>5	1	2
Parity		
0	18	67
1	15	74

2	2	20
3	4	8

Discussion

The results of the study on the pregnancy status of pregnant women in 10 stunting locus villages in Sumedang district found that the most gestational age of mothers based on the trimester of pregnancy was found in the second trimester (15-28 weeks), which was 47.4%. Based on GPA status, most were found in gravida 2 (43.1%), parity 1 (42.6%), abortion 0 (90.0%). On specific physical examination of anemia in pregnant women in 10 stunting locus villages in Sumedang regency found anemic conjunctiva (16.7%), pale lip mucosa (6.7%), koilonikia nails (3.8%). On hemoglobin examination with a quick test found 18.7% of pregnant women had anemia. The results of microscopic examination of faeces and anal swabs on STH infection in pregnant women showed negative results in all pregnant women with anemia.

The cross-tabulation found 25 mothers with an age range of 16-25 years suffering from anemia.⁶ Anemia in pregnancy is still a chronic problem in Indonesia as evidenced in the prevalence in pregnant women as much as 63.5%. In the last four years the prevalence of anemia did not show a significant decline. In the current era of development in Indonesia where the quality of human resources is a highly prioritized condition, the problem of anemia needs to be taken seriously.²⁵

According to the results of the 2018 Basic Health Research (Riskesdas), the prevalence of anemia in pregnant women in Indonesia is 48.9%.¹⁷ In pregnant women, the need for red blood cells is higher so that it triggers an increase in erythropoietin production. As a result, plasma volume increases and red blood cells (erythrocytes) increase. However, an increase in plasma volume occurs in a greater proportion compared to an increase in erythrocytes resulting in a decrease in hemoglobin (Hb) concentration due to hemodilution.⁹ According to WHO data, globally the prevalence of anemia in pregnant women throughout the world is 41.8%. The prevalence of anemia in pregnant women is estimated in Asia by 48.2%, Africa 57.1%, America 24.1%, and Europe 25.1%.²⁵

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In this study found the incidence of anemia was higher at the age of marriage 13-16 years and 17-20 years, namely 16 people and 17 people each. It is known that several factors that can cause anemia of pregnancy include gravid, age, parity, education level, economic status, and compliance with consumption of Fe tablets. General factors are risk factors for anemia in pregnant women. A mother's age is related to female reproductive organs. A healthy and safe reproductive age is 20-35 years old. Pregnancy at age of <20 years is biologically not yet having optimal emotions and tends to be unstable so it is easy to experience shock which results in a lack of attention to meeting nutritional requirements during pregnancy. While at the age of > 35 years is related with setbacks and decreased endurance and various diseases that often affect this age. So that in some health research states that the age of the mother can influence the emergence of anemia, namely the lower the age of the pregnant woman, the lower the hemoglobin level.²⁶

Through the results of cross-tabulation, 16 and 17 mothers were found suffered anemia in the marriage age group 13-16 years and 17-20 years respectively. Most pregnant women in the two age groups suffer from anemia, where marriages for women under 21 are classified as early marriages. This shows that there is a correlation between early marriage in women with anemia.²⁵

Married at young age is risked because lack of readiness from aspects of health, mental, economic, socio-economic, and reproductive. Adolescent pregnancy has negative impacts for the health of adolescents and their babies because of youth pregnancy can risk premature birth, low birth weight (LBW), labor bleeding, which can increase maternal and infant mortality.²⁶

Nutritional anemia is more common in pregnancy because at this time the need for food substances for physiological improvement during pregnancy. The cause of anemia during pregnancy in youth is caused by the lack of knowledge of nutrition during pregnancy in young people.²⁵ The level of education has an exponential relationship to nutritional and health status. The higher education, the higher awarness for pregnant women to get the better nutritional so anemia in pregnancy will not happend. The results of cross tabulation showed that 26 pregnant women had junior high school education in 10 stunting locus

villages in Sumedang district. The prevalence of anemic pregnant women with low education are greater with highly educated mothers.²⁸

Information from cross-tabulation shows that as many as 27 pregnant women in the family income group of Rp1,000,000 - Rp.2,000,000 suffer from anemia. Factors that influence the nutrition of pregnant women, especially with anemia, are economic status, because one's economy influences the selection of foods to be consumed daily. A person with a high economy then becomes pregnant so chances are that a large amount of needed nutrition is fulfilled plus the examination makes the mother's nutrition more monitored. Lack of family income causes location and for daily food purchases, thereby reducing the number and quality of maternal food per day which results in a decrease in nutritional status that is common in women is anemia, because physiologically menstruate every month. Food sources to prevent anemia generally come from protein sources that are more expensive and difficult to reach for those on low incomes. This deficiency increases the risk of anemia in adolescents and pregnant women and aggravates pain in the mother and in newborns. Anemia contributes to the high maternal mortality rate and increases with the increase in pregnancy rate.²⁸

In a study conducted by Ana Mariza in 2015, it was found that from 19 respondents the level of socio-economic was low, there were 14 people who had anemia (73.7%) while those who did not have anemia were 5 people (26.3%). Of the 11 respondents, the socioeconomic level was high, those who had anemia were 2 people (18.2%), while those who were not anemic were 9 people (81.8%) .In the study conducted by Oktaviani (2018), in the family income variable showed no difference between the level of family income < UMR (*upah minimum regional*, Regional Minimum Wage) and > UMR with the incidence of anemia.²⁹

The results of cross-tabulation show that anemia rates are higher in mothers with primigravida status, G1P0A0. This is in contrast to several studies. According to the Indian Journal of Community Health under the title "Correlates of anemia in pregnant women" in 2015 it was said that the incidence of anemia in pregnancy would increase with the height of the gravida. Multigravida can cause anemia due to reduced iron reserves due to use for previous pregnancies is not enough to meet the needs of current pregnancy.³⁰ According to the Scandinavian AOGS Journal entitled "Maternal and neonatal outcomes of antenatal anemia in a Scottish population: a retrospective cohort study" in 2016 said parity affects the

incidence of anemia in pregnancy, the more often a woman is pregnant and giving birth, the higher the risk of anemia because it depletes iron reserves in the body.³¹ According to the Journal of Indonesian Midwives Volume 4 in 2016 entitled "Factors Associated with Anemia, parity or the number of children born to a mother is closely related to birth distance. The higher the parity, the shorter the distance of birth. This can make a mother not have enough time to restore her body condition. High parity can cause maternal health conditions to decline and often experience less blood so that it adversely affects subsequent pregnancies.³²

CONCLUSION

This community-based study has shown the demographic characteristics of pregnant women mostly were aged 16-25 years, education level of junior high school, housewife, had 3-5 family members and family income was IDR 1,000,000 to IDR 2,000,000. The pregnancy status showed that most of the pregnant women were at second trimester with G2P1A0.

On the hemoglobin examination found that there were 18.7% pregnant women with anemia, with specific physical examination of anemia found conjunctival anemia, pale lip mucosal membrane, koilonychias (16.7%, 6.7%, 3.8%).

On the microscopic examination of fecal samples and anal swabs in pregnant women with anemia show neither STH eggs nor larvae.

Among pregnant women with anemia, there were all (100%) categorized as mild anemia according to severity assessment of anemia by WHO.

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