

## PREVALENCE AND RISK FACTORS OF ANAEMIA IN PREGNANT WOMEN IN PUBLIC HEALTH CENTRE PEKANBARU

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### Abstract

Anaemia has been a problem in developed and developing countries. It has negative effects on both mother and fetus. Anaemia increases the risks of complication in pregnancy and the process of delivery such as maternal death, prematurity, underweight birth, and perinatal death. This study was aimed to assess anaemia prevalence and to determine its factors in pregnant women. A cross-sectional survey was conducted from April to September 2014. The samples were 64 pregnant women who were anaemic and attended the antenatal-care facilities of Public Health Centre in Pekanbaru Indonesia. Accidental sampling technique was used. A single stool sample was also collected from each selected pregnant woman. Haemoglobin (Hb) level was determined by the cyanmethemoglobin method. The data were analyzed by descriptive analysis method. The prevalence of moderate anaemia was 81.3%. The highest risk factors of anaemia were based on (1) the characteristics of respondents: age of 20-35 years (73.4%), Minangnese (42.2%), house wife (92.2%), senior-high-school educated (46.9%), and 2-million-per-month income (75%); (2) the characteristics of pregnancy: multiparity (71.9%), third trimester of gestation (59.4%), > 2 years birth interval (43.8%), and antenatal-clinic visit less than 4 times (75%); and (3) consumption patterns: no food taboos (76.6%), no drinking tea (79.1%), and drinking coffee (67.2%). However, 15 respondents had food taboos (23.4%), and the highest taboo food was fish (9.36%); 21.9% of the respondents drank tea, and 67.2% of them drank coffee during pregnancy. The high prevalence of anaemia indicates that it is currently a serious health problem of pregnant women in Pekanbaru. The pregnant women should have more antenatal care to check and monitor their pregnancy condition and to get more education on food consumption.

**Keywords:** anaemia, antenatal care, food consumption, pregnant women

### BACKGROUND

Anaemia has been a problem in developed and developing countries. Anaemia is an indicator of both poor nutrition and poor health. Global Database of World Health Organization (WHO) on anaemia can be used to describe the nutritional status of populations and to identify the needs for interventions to prevent and control anaemia.

In 2008, WHO reported that 1.62 billion people (95% CI:1.50–1.74 billion) suffered from anaemia. The highest prevalence was in preschool-age children (47.4%), and the lowest prevalence was in men (12.7%). However, the population groups with the greatest number of affected individuals were non-pregnant women (73.5%) and pregnant women (69%).

Indonesia, as a developing country, has been facing problems of anaemia these days. According to

Riskesdas (2013), Indonesia has the highest case of anaemia compared to Southeast Asian countries such as Singapore and Malaysia. The number of cases of anaemia in pregnant women is 37.1%, with Hb level less than 11.0 g/dL. The case of anaemia in urban areas is almost the same with the one in rural areas: urban areas (36.4%) and rural (37.8%) (Naila, 2008).

The major concern about the adverse effects of anaemia in pregnant women is that it increases the risk of perinatal mortality and morbidity. According to Indonesian Demographic and Health Survey (IDHS) in 2012, it is known that Maternal Mortality Rate (MMR) was 359 per 100.000 live births. This data increased compared to the result in 2007 where in IDHS was 228 per 100.000 live births. Department of Health targets that by 2014 MMR should decrease to 118 per 100.000 live births as mandated by RPJMN 2010-2014 from 102 per

100,000 live births in 2015. Based on this data, it can be illustrated that the MDG targeted by the government is still far from expectation.

Anaemia adversely affects the health of mother and child. The anaemia in pregnant women will cause impaired oxygen supply to the fetus so that intrauterine hypoxia occurs. Another impact is the decreased ability of the mother to survive bleeding during and after childbirth. It can also cause premature birth and underweight birth, congenital abnormalities and impaired organ development (WHO, 2008; Uusitalo, L, et al, 2008). Dinana's study (2008) showed that there was a significant relationship between birth prematurity with anaemia in pregnant women. Moreover, anaemia during pregnancy has an impact on risk of death. Although it is not a major cause of maternal and infant mortality, 8% of cases contribute greatly to the cause of death such as bleeding and infection (WHO, 2008).

Anaemia leads to serious health implications. Most pregnant women are anemic due to iron deficiency. Iron-deficiency anaemia is a major case of anaemia in pregnant women compared to the deficiency of other nutrients. Iron-deficiency anaemia in pregnant women is mainly due to the physiological changes of pregnancy which is exacerbated by the state of malnutrition, vitamin B12, folic acid and vitamin C (Adi, 2012; Black, 2001). Other factor that cause anaemia in pregnant women is consuming food containing substances which can inhibit iron absorption such as phytate and tannin (Cunningham, 2002; Pillitteri, 2003). Harmani (2006) explained that the majority of respondents (77%) drank tea once a day, more than a half (63.3%) consumed less-than-recommended iron tablets, and more than a half (51.9%) suffered from anaemia.

Other risk factors that cause anaemia are age, parity, economic status, gravidity, short birth interval, ANC, nutrition deficiency, the incidence of infectious diseases and lack of access to and quality of health services (Tristiyanti, 2006; Aikawa, R; Khan. NC; Sasaki, S; Binns, C. B, 2005; Wiknjastro, 2005). In addition to the factors already described, other factor that contributes to the incidence of anaemia in pregnancy is a culture of food avoidance during pregnancy (Wahyuni, 2010). The culture of avoidance during pregnancy is assumed to occur in community, especially pregnant

women, for irrational reason; for example, eating durian and pineapple is forbidden because the heat resulted from such fruit can cause miscarriage and fetal death (Dahniar, 2009). Harmani (2006) found taboo-food culture in some pregnant women in Pekanbaru for some kinds of fish and fruit. For example, pregnant women should not eat squid because of the fear that the squid's purple or blue ink will make the skin of the born babies blue or black.

Based on the profile the Health Department of Riau Province's data (2009), pregnant women who had antenatal care as well as hemoglobin levels checked to determine anaemia status were 7774 people. Those whose Hb <8 g% were 309 people (3.97%), Hb 8-11 g% were 3,853 people (49.6%), and Hb > 11 g% were 3,612 people (46.5%). Based on Misrawati's research in 2013, there were 52% pregnant women who visited antenatal clinic in Umban Sari Pekanbaru.

The data illustrates that the occurrence of anaemia in pregnant women in Pekanbaru is still high. Although the government has implemented a program providing iron tablets for pregnant women that started in the second trimester to prevent anaemia, yet the case of anaemia is still quite high in pregnant women. Based on the above explanation, researchers were interested in conducting research on the prevalence and risk factors of anaemia in pregnant women in the coastal areas of the Siak River.

## METHOD

Research design used in this research was descriptive analysis with cross-sectional approach. The study was conducted at the health center Rumbai Pesisir Pekanbaru from April to September 2014. The samples were 64 pregnant women with anaemia (hemoglobin level < 11 g%). Accidental sampling technique was used. The instrument used was a questionnaire.

## RESULTS

The results of the study showed some risk factors of anaemia in pregnant women in public health center Rumbai Pesisir Pekanbaru, based on the classification of anaemia, characteristics of respondents, characteristics of pregnancy, and nutrition consumption patterns.

Anaemia was classified into severe anaemia, moderate anaemia and mild anaemia. The highest

number was moderate anaemia (79.7%), while severe anaemia was found to be 3.1%.

The risk factors of anaemia were based on the characteristics of respondents which included age, place of birth, occupation, education, and income rate. This study found out that pregnant women who had the highest risk of anaemia were those whose age was 20-35 years (73.4%), place of birth was Minang (42.2%), occupation was a house wife (92.2%), education was senior high school (46.9%), and average income was 2 million per month (75%).

The risk factors of anaemia were also based on the characteristics of pregnancy such as gravidity, trimester of gestation, birth interval and antenatal-clinic visit. This study showed that the highest risk of anaemia occurred in gravida, multiparous (71%); gestation, the third trimester (59.4%); birth interval, > 2 years (43.8%); and antenatal-clinic visit, less than 4 times (75%).

The risk factors of anaemia in pregnant women were also based on the nutrition consumption patterns which covered food avoidance or taboo and beverage consumption patterns during pregnancy. This study showed that the highest risk of anaemia occurred in respondents who had no food taboos (76.6%), who did not drink tea (79.1%), and who drank coffee (67.2%). However, 15 respondents had food taboos (23.4%), the highest food taboo was fish (9.36%); moreover, 21.9% of the respondents drank tea, and 67.2% of them drank coffee during pregnancy.

## DISCUSSION

Anaemia is a condition which is characterized by a reduction of red cell mass and a decrease of haemoglobin level in the blood. Anaemia is a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet physiological needs, which vary by age, sex, altitude, smoking, and pregnancy status. Anaemia in pregnancy occurred because of the process hemodelusi as a physiological process, in which the number of red blood cells is reduced leading to a reduction in the oxygen carrying capacity of blood (Pilliteri, 2003).

The anaemia in pregnant women is caused by iron deficiency, either due to physiological changes or the

intake of nutrients. Iron deficiency is thought to be the most common cause of anaemia globally, although other conditions, such as folate acid, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections, and inherited disorders, can cause anaemia (Black, 2001).

According to WHO (2006), anaemia is classified based on the haemoglobin (Hb) level into normal (Hb 11 g/dl), severe anaemia (Hb < 7 g/dl), moderate anaemia (Hb 7-9 g/dl), and mild anaemia (Hb 9- 10 g/dl).

The study found out that 64 people who visited public health center clinic suffered from anaemia. The highest case was moderate anaemia (79.7%). Severe anaemia was 3.1%. Based on the study of Kahder, Madi, Ricardo, Sabatinelli (2009) and Argawa (2006), the risk factor of moderate anaemia in pregnant women in Palestine was 2.5%. Naila Baig - Ansari, et al (2008) studied that in Pakistan 90.5% of pregnant women suffered from anaemia, and 14.8% were moderate. Anemic pregnant women would lead to the conception growth disorders, immaturity, prematurity, birth defects, or low-weighted born fetus (MOH, 2009). This situation is caused by the lack of oxygen and nutrients supply to the placenta that will affect the function of the placenta for fetus growth.

In normal pregnancy, the expansion of the plasma volume that precedes the increase of red cell mass creates a disproportionate expansion of plasma volume (50%) compared to the increase of red cell mass (30%). Therefore, Hb level starts to decline during the early part of the first trimester and reaches its end near the end of the second trimester and early part of the third trimester. In the last trimester of pregnancy, the rate of increase in plasma volume reaches a plateau, but the red cell mass continues to rise, resulting in a constant increase in the Hb level, which may reach normal levels at term. The prevalence of anaemia observed in the present study was increased (the mean values of Hb in the third trimester). This may be associated with the deficiency of related nutrients such as iron, folic acid and vitamin A (Prawirohardjo, 2006; Pilliteri, 2003).

Most anaemia in pregnant women are caused by iron deficiency, either due to physiological changes or because the intake of nutrients. Based on the results of

the study, several risk factors of anaemia in pregnant women included age, 20-30 years, (73.4%); ethnic, Minang (42.2%); occupation, house wife (92.2%); education, high school (46.9%); and income, 2 million per month (75%). This study was similar with Misrawati's research in 2013 that the most maternal age was in the range of 20-35 years (95%), secondary education (42.7%), and intermediate economic level (40%). Education describes the behavior of pregnant women in making decision. The higher the education the women have, the more rational the decisions they will make. It means they will be easier to accept new things, such as knowledge of anaemia, compared to those who have lower education. On the other hand, low income of the pregnant women will be associated with the fulfillment of nutritional needs during pregnancy. Less nutrition in pregnancy will affect the growth of the placenta and fetus (Dairo, 2004).

Other risk factors that cause anaemia are parity, economic status, gravidity, pregnancy interval, ANC, short birth interval, nutrition deficiency, the incidence of infectious diseases, and lack of access to and quality of health services (Tristiyanti, 2006; Aikawa, R; Khan. NC; Sasaki, S; Binns, C. B, 2005; Wiknjastro, 2005; Nwachi, 2010). This study found out that the risk factors of anaemia in pregnant women based on the characteristics of pregnancy were multiparity (71.9%), the third trimester of pregnancy (59.4%), birth interval more than 2 years (43.8%), less than 2 years (28.1%), and antenatal visit less than 4 times (75%).

Generally, pregnant women who have given birth several times often have high risk of anaemia, due to reduced vascularization and atrophic changes in the decidua as a result of previous labor. However, women who were pregnant for the very first time were also at risk because they did not have the experience which affected their behavior associated with nutritional status (Wiknjastro, 2005). This study was similar with Khader, Madi, Ricardo, Sabatinelli's research in 2009. The results showed that parity was 7 (48.8%), and 44.7% was third trimester. Misrawati in 2013 explained that anaemia occurred in the third trimester (56%) and multiparity (80%). Pregnant women in the third trimester tend to suffer from anaemia because the fetus needs more iron for himself as the first month after birth supplies.

Likewise, the interval of less than 2 years of pregnancy (short-interval pregnancy) will have an impact on nutritional needs due to maternal blood loss during childbirth as well as maternal nutrition reduction during lactation. The nutrients intake is not optimal, and they have to meet the nutritional needs of the fetus. Research Nasyidah (2011) found out that there was no relationship between pregnancy interval < 2 years and anaemia.

Antenatal visit to ANC during pregnancy is aimed to check and monitor both mother and fetus' health status and to detect anaemia. The visit should be done at least four times during pregnancy: once at first trimester (1-12 week of gestation), once at second trimester (13-24 week of gestation), and twice at third trimester (> 24 week of gestation) (Cunningham, 2005).

This research explained that pregnant women did not eat certain kind of food such as fish, eggs, and meat (23.4%). According to Rizal (2006), more than half of the respondents of the study (n = 79) have food taboos. For examples: squid (55.7%), shrimp (54.4%), fish-nine (51.9%), catfish (49.4%), all kinds of fish (11.4%), eggs (24.1%), mutton (17.7%), pineapple (29.1%), durian (32.9%), plantain flower (30.4%), eggplant (34.2%), and palm sugar (1.3%). More than half (70.9%) of respondents showed the adequacy of iron, vitamin C (65.8%) deficit, low-level of protein sufficient (26.6%), and protein deficit (21.5%).

The pregnant women who drank tea during pregnancy was 21.9% and coffee 32.8%. The results are similar with the Hamani (2006); Naila Baig - Ansari, et al, (2008) and Adi (2012) which showed that the majority of respondents (77%) drank tea once a day, more than half (63.3%) consumed iron tablets which was less than recommended, and more than half of the respondents (51.9%) were anemic. Tea contains tannins which are polyphenols that can inhibit iron absorption by binding it.

## CONCLUSION

This research explained risk factors of anaemia in pregnant women in Pekanbaru whose age were 20-35 years, occupation were house wives, education were high school, and whose earning were 2 million rupiah per month. The risk factors based on

characteristics of pregnancy were multiparity pregnancy, third trimester of gestation, birth interval which was more than 2 years, and antenatal visit to antenatal clinics which was less than 4 times. Other risk factors were food consumption patterns. The pregnant women did not consume certain food such as fish, egg, meal and chicken; moreover, they drank tea and coffee during pregnancy.

This research recommend that health workers at antenatal clinic give health education on anaemia and food consumption to pregnant women, and the pregnant women should have more antenatal care to check and monitor their pregnancy condition.

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