Correlation between folic acid and sulfas ferrosus supplementation during antenatal care and low birth weight at General Hospital Jombang, Indonesia

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Abstract

Antenatal care is a service provided by healthcare professionals for identifying health conditions among pregnant mothers. This study aimed to identify the correlation between Supplementation Folic Acid and Sulfas Ferrous during Antenatal Care and Low Birth Weight (LBW) at General Hospital Jombang, Jombang, East Java. Observational analytic design was used in this study with case control. Simple random sampling was chosen in this study. The data was analyzed using chi-square test if \( p \leq 0.05 \). According to chi-square test, the results showed a significance level of \( p = 0.000 \). Significant correlation was obtained from the result and depicted on contingency coefficient value reaching \( 0.626 \) with \( OR = 0.11 \) (95\%CI:0.02-0.65). It can be concluded that there is a significant correlation between supplementation Folic Acid and Ferrous Sulfate during Antenatal Care and Low Birth Weight (LBW).

Introduction

Low Birth Weight (LBW) babies are born weighing less than 2500 g regardless of gestational age. Infants under light called the 10th percentile for gestational age. LBW accounted for 60-80\% of all neonatal deaths. Global prevalence of low birth weight was 15.5\%, amounting to about 20 million LBW babies born each year, and 96.5\% of them come from developing countries.\(^1\)\(^2\) Reports Health Research (Riskesdas) 2013 showed the incidence of LBW in Indonesia had a prevalence of 10.2\%. East Java itself has a LBW prevalence of 11.2\%, this shows the high incidence of LBW in East Java province. In Jombang, sub district of East Java, LBW cases reached 3.71\%. Complete ANC visits in Indonesia reached mean value of 86.85. As for the East Java has reached complete ANC visits mean value of 87.36, meanwhile in Jombang, complete ANC visits reached mean value of 86.56, but this is still not yet reached the target of the health ministry’s strategic plan by 93\%.\(^3\)\(^4\) Based on the above, it turns out the incidence of babies with low birth weight infants is still high and birth weight have an important role to the development of the next child, the circumstances of pregnant women is very necessary to be considered. This can be reflected in the antenatal care during pregnancy.\(^7\)\(^-\)\(^12\)

Materials and Methods

Observational analytic study with case control study design was used to examine the relationship between supplementation of folic acid and sulfas ferrous during antenatal care with incidence of low birth weight babies. The study population was all mothers and infants in Jombang General Hospital who experienced low birth weight infants with age of pregnancy less than 37 weeks. The samples in this study were randomly selected infants and met the inclusion criteria. Samples in this study were as many as 22 infants sample case group that meet the following criteria: (1) infant medical record data at Jombang General Hospital who had low birth weight infants with age more than or equal to 37 weeks, (2) mother who are willing to be the respondent. Data was analyzed by Chi-Square test which is computerized using SPSS 20.0.\(^13\)

Results

Based on medical records in Jombang General Hospital, it was obtained data on mothers who gave birth from January 2015 until December 2015 as much as 1344 cases. 103 (29\%) of them were the cases of mothers who gave birth to babies with low birth weight with pregnancy over age or equal to 37 weeks, then divide into two groups, namely the group of infants who are not experiencing low birth weight as a control group of 30 cases and a baby who suffered low birth weight 30 cases as a group case.

Characteristics of respondents by age

From the results of the study, it can be seen the distribution of the characteristics of respondents based on age can be seen in Table 1 as follows:

Based on Table 1, it can be seen that in the group that experienced LBW (cases), the highest number of respondents was \(<20\) years old with 17 respondents. In the group that did not experience LBW (control), the highest number of respondents was found in the age range of 20-35 years, as many as 28 samples. Table 2 shows that in the case group, the majority of respondents with incomplete antenatal care visits were 26 respondents with a percentage of 86.7\%. In the control group, most respondents with complete antenatal care visits were 28 respondents with a percentage of 93.3\%.

From the Chi-Square test results, it was obtained a significance value of \( p \leq 0.05 \). It means that there is a relationship among antenatal care visits and the incidence of LBW (Table 3). The result of the closeness of the relationship (contingency coefficient)
is 0.626 meaning that the closeness of the relationship is strong in the sample that meets the inclusion criteria in Jombang Hospital. From the analysis table obtained OR value of 0.11 (95% CI: 0.02-0.65) it can be concluded that antenatal care visits are not a risk factor for the incidence of low birth weight babies but inhibiting factors where OR (0.11) <1.

Based on the results of the study in the case group, most mothers did not complete the Antenatal Care visit. For the control group, most of the mothers had completed Antenatal Care visits. The hypothesis which states that there is a relationship between Antenatal Care visits and the incidence of LBW, as evidenced by using the Chi Square test shows a significance value of p is 0.000 smaller than 0.050 with a correlation of 0.626, OR value of 0.11 (95% CI: 0.02-0.65), so it can be concluded that the Antenatal Care visit with the incidence of LBW in Jombang Hospital has a significant relationship with the strength of strong relationships but Antenatal Care visits are not a risk factor for the incidence of low birth weight babies but inhibiting factors where OR (0.11) <1. The results of this study are in accordance with Pal’s study (2016) which states that mothers who gave birth to LBW mostly did not complete Antenatal Care visits. Antenatal Care provides regular monitoring during pregnancy to identify the mother and fetus about nutritional problems and diseases that can cause LBW. Antenatal Care visits are incomplete due to many factors, including low socio-economic and maternal knowledge.14-19

According to Khan there was a significant relationship between Antenatal Care visits and the incidence of LBW. In his research, 67% of mothers who gave LBW to do antenatal care were incomplete or <4 times. An increase in the number of Antenatal Care visits reduced the risk of LBW by OR 0.56. Antenatal Care visit is a protective factor for LBW. WHO recommends at least four times conducting Antenatal Care visits. Complete Antenatal Care visit or ≥4 times is expected to reduce the risk of LBW because it will create health awareness in pregnant women and correctly identify complications during pregnancy. Previous study showed a statistically significant relationship (p = 0.001) between Antenatal Care visits and the incidence of LBW. Mothers who did an incomplete Antenatal Care visit were more prone to give birth to LBW than mothers who had complete Antenatal Care visits.20-22 The supplementation of Folic Acid and Sulfas Ferrous intake when a complete Antenatal Care visit can provide a protective effect on LBW.23,24

In women with an average or low body mass index, a little weight gain during pregnancy can cause fetal growth. Indonesia randomly provides micronutrient supplements or only iron and folate tablets for pregnant women during Ante Natal Care. Babies born to mothers who receive these supplements have a reduced risk of death and low birth weight.25-29

Antenatal Care is one of the four pillars of Safe Motherhood and is used throughout the world. It can help pregnant mothers to prepare their baby births. The number and distance of Antenatal Care visits performed by mothers during pregnancy play an important role in ensuring and improving the quality of health for mothers and newborns.22,25 The quality and utilization of Antenatal Care visits is very important in achieving good pregnancy outcomes. This study audits the services that must be provided in the Antenatal Care visit which includes measuring weight and height, blood pressure, screening for anemia, tests for syphilis, urine testing, malaria prevention, TT immunization, HIV testing, and micronutrient supplementation.22,28,29 Previous study showed that there was a strong relationship between lack of Antenatal Care visits and the incidence of LBW. Antenatal Care Visit provides regular monitoring of height and weight, identification of maternal illness or fetal problems, providing education on the dangers of cigarette consumption or substance use, providing psychosocial support, nutritional advice, and prevention of complications.5,23,28,29

The limitation of the study is that in this study bias can occur because there are many factors related to the incidence of low birth weight infants.

### Conclusions

It can be concluded that there is a significant relationship between administration of folic acid and sulfas ferrous with the incidence of low birth weight infants. Mothers who had irregular antenatal care visits will have low birth weight babies, and mothers who had regular Antenatal Care visits gave birth to a normal birth weight babies.

### Table 1. Characteristics of respondents by age.

| Age     | Frequency | LBW | %     | Without LBW | Frequency | %     |
|---------|-----------|-----|-------|-------------|-----------|-------|
| <20 yrs | 17        | 13.3|       | 0           | 0         | 0     |
| 20-35 yrs | 8        | 70  | 28    | 93.3        |           |       |
| >35 yrs | 5         | 16.7| 2     | 6.7         |           |       |
| Total   | 30        | 100 |       | 30          | 100       |       |

### Table 2. Characteristics of respondents based antenatal care visits.

| Visiting Status of Antenatal Care | Frequency | LBW | %     | Without LBW | Frequency | %     |
|----------------------------------|-----------|-----|-------|-------------|-----------|-------|
| Complete                         | 4         | 13.3|       | 28          | 93.3      |       |
| Incomplete                       | 26        | 86.7| 2     | 6.7         |           |       |
| Total                            | 30        | 100 |       | 30          | 100       |       |

### Table 3. Chi-Square hypothesis test antenatal care visit with low birth weight babies.

| ANC Status | LBW | Without LBW | p   | r   | OR  | CI   |
|------------|-----|-------------|-----|-----|-----|------|
| n          | %   | n           |     |     |     |      |
| Complete   | 4   | 13.3        | 28  | 93.3|     |      |
| Incomplete | 26  | 86.7        | 2   | 6.7 | 0.000 | 0.626 | 0.11 | 0.02 | 0.65 |
| Total      | 30  | 50          | 30  | 50  |     |      |

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