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The Relationship of History of Syphilis Disease in Pregnant Women with the Incidence of Low Birth Weight at RSUD Dr. Soetomo Surabaya

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ABSTRACT

Introduction : *The World Health Organization explains that Low Birth Weight (LBW) is a condition in which a baby is born weighing <2500 grams. Two factors cause LBW, namely internal and external factors. Based on internal maternal factors, the infectious disease that can cause LBW and is the focus of the current government is Syphilis. The disease can be suffered by pregnant women and is at risk of being transmitted to their babies during pregnancy and during labor.* ***Objectives:*** *The aim of this research was to examine the historical development of Syphilis in pregnant women with the incidence of LBW at RSUD. Dr. Soetomo Surabaya.* ***Methods*** *: This research utilizes a quantitative approach with an observational analytical method, employing a cross-sectional design. The sample consists of 8 pregnant women as respondents with a history of Syphilis disease carried out by purposive sampling technique at RSUD. Dr. Soetomo Surabaya. The collected data were tested with chi-square statistical test.* ***Results:*** *The results respondents with positive syphilis infection, a total of 3 people (18,75%) gave to LBW babies while 5 people (31,23%) gave to birth normal weight babies. A total of 2 patients (12,5%) with negative syphilis also gave birth to LBW babies, while 6 people (37,5) of laboring mothers with negative syphilis gave birth to normal weight babies. The collected syphilis data tested with chi-square statistical test obtained p-value = 0.590 (p>0.05)* ***Conclusions:*** *This is history of Syphilis does not affect the incidence of LBW.*

Introduction

According to a statement from the Ministry of Health of the Republic of Indonesia, in 2019, the high infant mortality rate (IMR) was still closely related to low birth weight (LBW). This is in line with the World Health Organization which states that LBW is a condition of baby is born who weigh < 2500 gr and the LBW incidence rate is still quite big in developing countries at 96.5% of cases. Around 15.5% of births worldwide result in low birth weight, equating to more than 20.6 million infants being born with LBW annually. Of these data, about 96.5% occur in developing countries (WHO, 2016). In addition, based on data from 25 provinces to the Directorate of Community Nutrition in 2019, there were around 111,827 babies or 3.4% born with LBW. In the 2018 Riskesdas data, it stated that there were 56.6% of toddlers had birth weight records, as many as 6.2% were born with LBW (Indonesian Ministry of Health, 2020)

The two factors that influence LBW are internal and external factors. The first factor is external, consisting of social and environmental factors. The second factor is internal factors, namely from maternal, fetal, placental factors. (Hollingworth, 2012). The weight of a baby is significantly influenced by factors related to the mother, this fetal growth and development is closely related to the physical condition of the mother during her pregnancy (Kusumawati, 2017; Sharon et al., 2012). The most likely infectious disease that can be transmitted from mother to

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fetus and can cause LBW is Syphilis, as it can cause morbidity, disability, and death in the mother, and for the fetus it can cause a decrease in quality of life (Alfieri & Yogianti, 2021).

Syphilis is an infection spread through sexual contact, triggered by the bacterium Treponema pallidum. This disease can impact various organs throughout the body and is contagious, spreading from person to person through direct contact until the latent period and can recur (Windari, 2015). This syphilis disease can be suffered by pregnant women and is at risk of being transmitted to their babies during pregnancy and during labor. Based on 2017, there were 205 female patients in Surabaya, 126 people (30 women, 96 men) Syphilis patients have been reported (East Java Health Office, 2018). In addition, the incidence record from 2020-2023, at RSUD Dr. Soetomo Surabaya recorded mothers who gave birth with a total incidence of LBW in 2020-2023 around 1,788 people. In addition, mothers who gave birth with a history of Syphilis disease in 2020-2023 were around 9 people. Research on providing counseling on triple elimination provides results that can increase pregnant women's awareness of the dangers of infectious disease infection. So that the triple elimination rate is achieved, and pregnant women are better prepared for the next pregnancy (Saptono et al., 2024). Based on this research was to investigate if there was any history of syphilis among pregnant women who experienced low birth weight (LBW) in their pregnanciesat Dr. Soetomo Surabaya Hospital?

Methods

The approach adopted for this study is quantitative, employing an analytical observational design. A cross-sectional research design is utilized in this investigation. The participants in this research consist of mothers who delivered between 2020 and 2023 at Dr. Soetomo Surabaya Hospital. The criteria for inclusion in the study are as follows: a) Syphilis screening data on mothers with a history of vaginal delivery and cesarean section treated at Dr. Soetomo Surabaya Hospital in 2020-2023; b) Data on babies born alive at Dr. Soetomo Surabaya Hospital in 2020-2023; c) Mothers with a history of LBW both vaginally and cesarean section treated at Dr. Soetomo Surabaya Hospital in 2020-2023. Exclusion criteria in this study were incompletely recorded medical record data of pregnant women and infants. The sample size for this research is established using data obtained from the medical records of mothers giving birth with a sample size of 8 patients with reactive syphilis (R) and 8 patients with syphilis (NR) in 2020-2023 at RSUD Dr. Soetomo, with inclusion criteria and the criteria for excluding individuals within the current population.

The sampling technique in this study was purposive sampling, namely by taking samples from the medical record data of mothers who gave birth with a history of Syphilis disease in 2020-2023 at Dr. Soetomo Surabaya Hospital. Data collection techniques in this study using secondary data, namely patient medical records.

The data were examined through the Chi-Square test, applying both Univariate and Bivariate analysis methods. The Chi-Square st identifies differences in one or more categories between what is expected and observed so, this test assesses the expected actual data.

Results

The findings from the collection of medical record data at RSUD Dr. Soetomo reveal that, the total number of mothers with syphilis was 8 people and 8 non-reactive syphilis.

Table 1 Frequency Distribution of General Characteristics Data

Respondent Characteristics	Frequency (f)	
	Syphilis	Percentage(%)

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	R	NR	
Age			
<20	0	0	0
20-35	6	7	81,3
>35	2	1	18,7
Education			
Grade School	0	0	0
JHS	2	2	25,0
SHS	4	6	62,5
Bachelor's Degree	1	0	6,25
Other	1	0	6,25
Work			
Working	3	2	31,3
Not Working	5	6	68,7
Other	0	0	0
Totally	8	8	100

Quantitative analysis of the profile of respondents with clinical manifestations of syphilis has been summarized in the construction of a matrix showing frequency distribution by age group, namely most maternity patients aged 20-35 years, 13 people (81.3%). Frequency distribution based on education, most respondents had a high school / equivalent education level as many as 10 people (62.5%). Frequency distribution based on occupation, mothers who do not work are the majority with a total of 11 people (68.7%).

In the statistical representation listed in Table 2, respondents were grouped according to the history of the number of pregnancies they had experienced., most of the birth mothers with syphilis infection have multigravida status with data as many as 13 people (81.25%). Frequency distribution based on marital status, most respondents were only married once with a total data of 15 people (93.75%). Frequency distribution based on maternal disease history, most respondents had no history of disease as many as 9 people (56.25%). Frequency distribution based on past obestetric history, most respondents did not experience complications or problems in previous pregnancies with a total of 8 people (50.0%). Frequency distribution based on complications during pregnancy, most of the birth mothers with syphilis infection who became respondents experienced complications during pregnancy with a total data of 15 people (93.75%).

Table 2 Frequency distribution of maternal data

Respondent Characteristics	Frequency (f)		Percentage(%)
	Syphilis		
	R	NR	
Gravida			
Primigravida	3	0	18,75
Multigravida	5	8	81,25
Grandemulti	0	0	0
Marriage Status			
Marriage 1x	8	7	93,75
Marriage >1x	0	1	6,25
Other	0	0	0

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Mother's medical history			
Available	4	3	43,75
None	4	5	56,25
Past Obstetric History			
Abortion	1	1	12,5
Caesarean Sectio	1	4	31,25
Other	0	1	6,25
None	6	2	50,0
Complications during pregnancy			
Available	8	7	93,75
None	0	1	6,25
Infections During Pregnancy			
Syphilis	8	8	50,0
Type of Delivery			
SC	8	8	100,0
Vaginal	0	0	0
Complications during labor			
Available	7	6	81,25
None	1	2	18,75
Totally	8	8	100

Frequency distribution based on the type of infection during pregnancy is dominated by syphilis infection, namely 8 people (50%) reactive and 8 people (50%) non-reactive syphilis. The frequency distribution of data based on the type of delivery, all mothers with syphilis infection who were respondents delivered by SC with a total of 16 people (100%). The frequency distribution of data based on complications during labor has most of the data 13 people (81.25%) have complications during labor.

Table 3 Frequency Distribution of Baby Data

Karakteristik Responden	**Frekuensi (f)**		**Persentase(%)**
	Sifilis		
	R	**NR**	
Birth Weight			
<2500 g	3	2	31,25
≥2500 g	5	6	68,75
Birth Lenght			
<45 cm	1	0	6,25
≥45 cm	7	8	93,75
Complications in Infants			
Available	3	2	31,25
None	5	6	68,75
Total	8	8	100

Through analysis of the data in Table 3, infant birth weight was categorized and mapped., most of the data, namely 11 people (68.75%) had a birth weight of ≥2500g. Frequency distribution of data based on the length of the baby's body at birth, most of the babies born had a body length of ≥45 cm with a total of 15 people (93.75%). Finally, data distribution based on

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complications in infants at birth, most of the data with a total of 11 infants (68.75%) did not experience complications at birth.

Table 4 Bivariate analysis of syphilis on LBW incidence

No	Variable	Incidence of LBW			*P Value*
		Available	None	Totally	
		f (%)	f (%)	f (%)	
1	**Syphilis Infection**				0.590
	Positive	3 (18,75)	5 (31,25)	8 (50,0)	
	Negative	2 (12,5)	6 (37,5)	8 (50,0)	

Based on Table 4 about chi-square was applied to evaluate statistical relationships and correlations in the research findings. of syphilis infection variables on the incidence of LBW in laboring mothers shows that respondents with positive syphilis infection as many as 3 people (18.75%) gave birth to babies with LBW while 5 people (31.25%) gave birth to babies with normal weight. A total of 2 patients (12.5%) with negative syphilis also gave birth to babies with LBW, while 6 people (37.5%) of laboring mothers with negative syphilis gave birth to babies with normal weightBased on the results of the statistical test, the p value for the syphilis infection variable was obtained as 0.590, higher than the $\alpha = 0.05$ level. So it can be concluded that the hypothesis (H1) is rejected, so there is no significant effect on syphilis infection on the incidence of LBW in laboring mothers.

Discussion

Prevalence case Syphilis disease in pregnant women. Based on the data obtained, the prevalence rate of syphilis in pregnant women at RSUD. Dr. Soetomo from 2020 - 2023 was 8 of them with reactive syphilis, 3 people (18.75%) gave birth to LBW babies while 5 people (31.25%) gave birth to normal weight babies, then a total of 2 people (12.5%) with non-reactive syphilis also gave birth to LBW babies, while 6 people (37.5%) maternity mothers with negative syphilis gave birth to normal weight babies. Thus, in this study mothers with reactive or non-reactive syphilis had there is no influence on the incidence of LBW.

Prevalence case the incidence of low birth weight. Referring to health statistics documentation published by national health agencies, the percentage of syphilis incidence in Indonesia in 2020 amounted to 18,437 cases, in 2021 it decreased to 17,280 cases, in 2022 there was a spike to 20,783 cases. In 2020, Percentage distribution of syphilis reactivity among pregnant women was 27% of the 20,783 cases, of which around 2,227 people (40%) were treated, while the other (60%) did not receive treatment. This does not rule out the possibility that babies born to pregnant women with reactive results can also be exposed to syphilis, even though the baby does not experience LBW.

One of the mechanisms of Syphilis during pregnancy is T. *pallidum sp*. which spreads to various organs in the fetus and causes damage umbilical cord and the placenta. This results in an inflammatory response that can inhibit intrauterine growth, stillbirth or premature birth (Gomez et al., 2013). As in research on gestational syphilis, found that pregnant women who did not receive treatment had a higher risk of premature birth and LBW (Gomez et al., 2013; Padovani et al., 2018; Wan et al., 2020).

Correlations between the two variable. The results of the analysis show alignment with the research of Luo et al (2019) through a longitudinal study approach, which confirms that there is no significant relationship in the variables studied. gave birth while exposed to syphilis and

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mothers who did not give birth while exposed to syphilis during pregnancy with the incidence of LBW. This is if pregnant women are exposed to syphilis, it does not affect the baby's weight at birth. Another study by da Silva et al., 2024 using a longitudinal study that if the mother is exposed to syphilis during pregnancy, does not perform routine ANC <6x, and does not get treatment, there is a high risk of giving birth to a baby with LBW, premature, or IUGR.

Conclusion

This study found that there was no relationship between mothers giving birth and a history of syphilis, there was no influence on the incidence with a p-value (0.590> 0.05), based on this study, it is hoped that further research will add several new variables, including in infants added related to apgar score, baby's head circumference, then in the mother's history can be added related to sexual activity, history of drugs consumed, and triple elimination screening in pregnant women.

Ethics approval and consent to participate

The authors have obtained ethical permission from the Health Research Ethics Committee with reference number 3089/104/4/VIII/2024 to Dr. Soetomo Hospital Surabaya.

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