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The Relationship Between Sexually Transmitted Infections (STIs) and Preterm Birth at Tomalou Primary Health Care Center

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Abstract, Preterm birth remains a significant public health concern due to its contribution to neonatal morbidity and mortality worldwide. Among the various risk factors, maternal infections—particularly sexually transmitted infections (STIs)—have been identified as preventable yet critical determinants of premature delivery. This study aimed to examine the relationship between STIs and preterm birth among mothers receiving care at Tomalou Primary Health Care Center. A cross-sectional analytical design was employed, involving 30 postpartum mothers whose medical records and antenatal care data were available. Data on STI status and birth outcomes were collected from health center records and laboratory results, while maternal demographic and obstetric characteristics were also documented. Results indicated that 40% of participants were diagnosed with STIs during pregnancy, and 33.3% experienced preterm birth. Chi-square analysis revealed a significant association between maternal STI status and preterm delivery ($p = 0.003$). Logistic regression demonstrated that mothers with STIs were sixteen times more likely to deliver prematurely compared to uninfected mothers (OR = 16.0; 95% CI: 2.45–104.3; $p = 0.002$). These findings suggest that STIs represent a substantial risk factor for preterm birth, even among mothers with adequate antenatal care attendance. Early detection, timely treatment, and comprehensive reproductive health education are recommended to reduce infection-related adverse outcomes. Strengthening STI screening and management within primary healthcare settings is essential to improve maternal and neonatal health outcomes. This study provides evidence for the importance of integrating infection prevention strategies into routine antenatal care to mitigate the risk of premature delivery.

Keywords: Antenatal Care, Maternal Health, Preterm Birth, Primary Health Care, Sexually Transmitted Infections.

1. INTRODUCTION

Preterm birth remains one of the leading causes of neonatal morbidity and mortality worldwide, contributing significantly to long-term health complications such as respiratory disorders, neurodevelopmental impairment, and increased risk of chronic diseases later in life. The World Health Organization estimates that approximately 15 million babies are born prematurely each year, with higher prevalence in low- and middle-income countries where maternal health challenges remain substantial (World Health Organization [WHO], 2023).

In Indonesia, preterm birth continues to be a major public health issue, accounting for a considerable proportion of neonatal deaths. Despite ongoing improvements in maternal and child health services, the incidence of premature delivery remains high, particularly in rural and semi-urban areas where access to comprehensive antenatal care may be limited (Ministry of Health of the Republic of Indonesia, 2022).

Various maternal factors have been identified as contributors to preterm birth, including maternal age, parity, nutritional status, chronic diseases, and infections during pregnancy. Among these factors, maternal infections—especially infections of the

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reproductive tract—are increasingly recognized as preventable yet under-addressed causes of premature labor (Goldenberg et al., 2008).

Sexually transmitted infections (STIs), such as syphilis, gonorrhea, chlamydia, trichomoniasis, and HIV, remain prevalent among women of reproductive age. These infections often present asymptomatically, leading to delayed diagnosis and treatment, particularly during pregnancy when physiological changes may mask clinical symptoms (Centers for Disease Control and Prevention [CDC], 2021).

Several biological mechanisms explain the association between STIs and preterm birth. Pathogens causing STIs can ascend from the lower genital tract to the uterus, triggering inflammatory responses, premature rupture of membranes, and uterine contractions, which ultimately increase the risk of preterm labor (Romero et al., 2014).

Inflammation caused by untreated STIs stimulates the release of pro-inflammatory cytokines and prostaglandins, which play a crucial role in initiating labor. When these inflammatory processes occur prematurely, they may disrupt normal gestational development and result in early delivery (Gibbs et al., 2012).

Evidence from international studies indicates that pregnant women with untreated STIs are significantly more likely to experience adverse pregnancy outcomes, including preterm birth, low birth weight, and neonatal infections. However, the magnitude of this risk varies across regions due to differences in healthcare systems, screening practices, and socio-cultural factors (Silva et al., 2020).

In primary healthcare settings, particularly at community health centers, routine screening for STIs during antenatal care is often inconsistent. Limited laboratory facilities, lack of trained personnel, and insufficient awareness among pregnant women contribute to underdiagnosis and undertreatment of STIs (WHO, 2022).

At UPT Puskesmas Tomalou, preliminary observations suggest that cases of preterm birth remain a recurring maternal health concern. However, documentation related to maternal infection status, particularly sexually transmitted infections, is often incomplete or not systematically analyzed, making it difficult to identify preventable risk factors contributing to premature delivery.

Despite the known biological plausibility linking STIs to preterm birth, local data examining this relationship in the context of Tomalou Primary Health Care Center are currently limited. Most existing studies focus on hospital-based populations, while evidence from primary healthcare settings remains scarce (Blencowe et al., 2019).

This lack of localized evidence represents a significant research gap, as community health centers play a crucial role in providing antenatal services, early detection of maternal health problems, and preventive interventions. Without context-specific data, healthcare providers may face challenges in developing targeted strategies to reduce preterm birth rates (March of Dimes, 2020).

Furthermore, socio-cultural factors, such as stigma associated with sexually transmitted infections, limited sexual health education, and low health-seeking behavior, may influence the prevalence of untreated STIs among pregnant women. These factors highlight the importance of understanding the local context when addressing maternal infections and pregnancy outcomes (UNAIDS, 2021).

Addressing the relationship between STIs and preterm birth requires not only clinical interventions but also strengthened health education, improved antenatal screening protocols, and enhanced collaboration between maternal health and reproductive health programs at the primary care level (WHO, 2022).

Conducting research on the association between sexually transmitted infections and preterm birth at UPT Puskesmas Tomalou is essential to generate evidence-based insights that reflect the local population's characteristics and healthcare challenges. Such evidence can support early detection and timely management of STIs during pregnancy (Goldenberg et al., 2008).

The findings of this study are expected to contribute to the development of preventive strategies, including routine STI screening during antenatal care, counseling on reproductive health, and prompt treatment of identified infections to reduce the risk of preterm birth (CDC, 2021).

Ultimately, strengthening STI prevention and management within maternal healthcare services has the potential to improve pregnancy outcomes, reduce neonatal morbidity and mortality, and support national efforts to achieve sustainable maternal and child health goals, particularly in primary healthcare settings like UPT Puskesmas Tomalou (WHO, 2023).

2. RESEARCH METHOD

This study employed an analytical observational design with a cross-sectional approach to examine the relationship between sexually transmitted infections (STIs) and the incidence of preterm birth among pregnant women at Tomalou Primary Health Care Center. The cross-sectional design was selected to assess exposure to STIs and pregnancy outcomes

simultaneously within a defined population and time frame, allowing for efficient identification of associations between variables in a primary healthcare setting (Setia, 2016).

The study population consisted of all postpartum mothers who delivered at or were referred from Tomalou Primary Health Care Center during the study period. A total sampling technique was applied to include all eligible participants who met the inclusion criteria, such as complete medical records and documented gestational age at delivery. Data were obtained from maternal health registers, antenatal care records, and laboratory examination results related to STI screening (WHO, 2022).

The independent variable in this study was the presence of sexually transmitted infections during pregnancy, while the dependent variable was preterm birth, defined as delivery before 37 completed weeks of gestation. STI status was determined based on documented diagnoses or laboratory-confirmed results for infections such as syphilis, gonorrhea, chlamydia, and HIV. Preterm birth classification was based on obstetric records. Data analysis was performed using chi-square tests to determine the association between variables, followed by logistic regression analysis to control for potential confounding factors such as maternal age, parity, and antenatal care visits (Kirkwood & Sterne, 2003).

Ethical clearance was obtained from the institutional ethics committee prior to data collection. Confidentiality and anonymity of participants were strictly maintained by using coded data and restricting access to research records. The study adhered to ethical principles of biomedical research, including respect for persons, beneficence, and justice, ensuring that the use of secondary data did not compromise participants' rights or wellbeing (World Medical Association, 2013).

3. RESULTS AND DISCUSSION

General Characteristics of Respondents

Table 1. Distribution of Respondents Based on General Characteristics (n = 30).

Variable	Category	Frequency (n)	Percentage (%)
Maternal Age	< 20 years	4	13.3
	20–35 years	20	66.7
	> 35 years	6	20.0
Parity	Primiparous	14	46.7
	Multiparous	16	53.3
Antenatal Care Visits	< 4 visits	9	30.0
	≥ 4 visits	21	70.0
Education Level	Low	11	36.7

High	19	63.3

Interpretation:

The majority of respondents were within the reproductive age range of 20–35 years, accounting for more than two-thirds of the study population. Slightly more than half of the participants were multiparous, indicating prior childbirth experience. Most respondents attended antenatal care services at least four times during pregnancy, reflecting relatively adequate utilization of maternal health services. Additionally, a higher proportion of respondents had a higher level of education, which may influence health-seeking behavior and awareness of pregnancy-related risks.

Specific Data Distribution

Table 2. Distribution of Sexually Transmitted Infections and Preterm Birth (n = 30).

Variable	Category	Frequency (n)	Percentage (%)
STI Status	Positive	12	40.0
	Negative	18	60.0
Birth Outcome	Preterm	10	33.3
	Term	20	66.7

Interpretation:

Less than half of the respondents were identified as having sexually transmitted infections during pregnancy, while the majority tested negative. One-third of the respondents experienced preterm birth, indicating that premature delivery remains a notable maternal health issue in the study area.

Relationship Between STI and Preterm Birth

Table 3. Chi-Square Test of STI Status and Preterm Birth.

STI Status		Preterm Birth n (%)	Term Birth n (%)	Total	p-value
Positive (66.7%)	8	8 (66.7%)	4 (33.3%)	12	
Negative		2 (11.1%)	16 (88.9%)	18	
Total		10	20	30	0.003

Interpretation:

The chi-square analysis demonstrated a statistically significant association between sexually transmitted infections and the incidence of preterm birth (p = 0.003). A substantially

higher proportion of preterm births occurred among mothers who tested positive for STIs compared to those without infections. This finding suggests that pregnant women with STIs were more likely to deliver prematurely.

Strength of Association (Odds Ratio)

Table 4. Logistic Regression Analysis of STI and Preterm Birth.

Variable	Odds Ratio (OR)	95% CI	p-value
STI Status	16.00	2.45 – 104.30	0.002

Interpretation:

Logistic regression analysis revealed that mothers with sexually transmitted infections had a sixteen-fold higher risk of experiencing preterm birth compared to those without infections. The confidence interval did not cross unity, and the association remained statistically significant, indicating that STI status is a strong predictor of preterm birth in this study population.

Overall Results Summary (Paraphrased)

The findings of this study indicate that sexually transmitted infections during pregnancy are significantly associated with an increased risk of preterm birth. Despite adequate antenatal care attendance among most respondents, the presence of STIs remained a substantial risk factor for premature delivery. These results highlight the importance of early screening, timely diagnosis, and appropriate management of STIs as part of comprehensive antenatal care to reduce adverse pregnancy outcomes.

Discussion

The findings of this study provide strong evidence that sexually transmitted infections (STIs) are significantly associated with the incidence of preterm birth among pregnant women at Tomalou Primary Health Care Center. Statistical analysis using the chi-square test revealed a meaningful relationship between STI status and birth outcomes, indicating that maternal infection remains an important determinant of gestational duration (Goldenberg et al., 2008).

The proportion of preterm birth was notably higher among mothers who tested positive for STIs compared to those who were uninfected. This finding reflects a clear epidemiological pattern where infectious exposure during pregnancy increases vulnerability to adverse outcomes, particularly premature delivery, which has been widely documented in maternal health literature (Blencowe et al., 2019).

The logistic regression analysis further strengthened these findings by demonstrating that mothers with STIs had a markedly increased risk of preterm birth. The elevated odds ratio suggests that STIs act as a strong predictor of premature labor, even when compared to other maternal characteristics, emphasizing the clinical relevance of infection control during pregnancy (Gibbs et al., 2012).

From a biological perspective, the relationship observed in this study can be explained through inflammatory mechanisms triggered by infectious pathogens. STIs can ascend from the lower genital tract into the uterine environment, stimulating inflammatory mediators that may prematurely activate labor pathways (Romero et al., 2014).

Inflammatory responses associated with STIs promote the release of cytokines, chemokines, and prostaglandins, which play a central role in cervical ripening and uterine contractions. When these processes occur before term, they increase the likelihood of preterm labor, supporting the biological plausibility of the study findings (Gibbs et al., 2012).

Despite most respondents having adequate antenatal care visits, the persistence of STIs among pregnant women suggests that antenatal care utilization alone is insufficient to prevent infection-related complications. This highlights a gap in the quality of antenatal services, particularly regarding routine STI screening and follow-up (World Health Organization [WHO], 2022).

The predominance of respondents within the optimal reproductive age range (20–35 years) indicates that preterm birth associated with STIs is not confined to traditionally high-risk age groups. This suggests that infectious factors may override the protective effects of age, making comprehensive infection screening necessary for all pregnant women (Blencowe et al., 2019).

Parity did not appear to protect mothers from infection-related preterm birth, as both primiparous and multiparous women were affected. This finding supports previous studies showing that the biological impact of infection on pregnancy outcomes is relatively independent of obstetric history (Silva et al., 2020).

Educational background, although relatively high among respondents, did not eliminate the occurrence of STIs. This implies that knowledge alone may not translate into preventive behavior, especially in contexts where stigma, cultural norms, and limited partner involvement influence sexual health practices (UNAIDS, 2021).

The results also reflect challenges commonly faced in primary healthcare settings, such as limited laboratory capacity, delayed diagnosis, and inconsistent documentation of STI

screening results. These systemic constraints may contribute to missed opportunities for early detection and timely treatment of infections during pregnancy (WHO, 2022).

Compared with hospital-based studies, this research provides valuable insight from a community-level healthcare facility, where most pregnant women receive routine antenatal care. The findings emphasize the importance of strengthening primary healthcare services as a frontline strategy for preventing preterm birth (March of Dimes, 2020).

The significant association observed in this study is consistent with international research demonstrating that untreated STIs contribute substantially to preterm birth, low birth weight, and neonatal morbidity. This consistency supports the external validity of the findings, despite the study's relatively small sample size (Goldenberg et al., 2008).

From a public health perspective, the findings highlight the need for integrated maternal and reproductive health programs. STI prevention should be incorporated into antenatal care through standardized screening protocols, partner treatment strategies, and continuous monitoring (Centers for Disease Control and Prevention [CDC], 2021).

The study also underscores the importance of early pregnancy screening, particularly during the first trimester, when treatment interventions are more effective in preventing infection-related complications later in gestation (Romero et al., 2014).

Although this study provides important insights, certain limitations must be considered. The use of secondary data may limit control over data completeness, and the small sample size may affect statistical power. Additionally, variations in STI type and severity were not analyzed separately, which may influence outcome variability (Setia, 2016).

Nevertheless, the statistically significant findings suggest that the observed relationship is robust enough to warrant clinical and programmatic attention. The results support existing theories that infection-related inflammation is a key pathway leading to preterm labor (Gibbs et al., 2012).

In the context of Tomalou Primary Health Care Center, these findings can inform evidence-based decision-making, encouraging healthcare providers to prioritize STI screening and counseling as part of routine antenatal services. Such interventions have the potential to reduce preventable preterm births and improve neonatal survival (WHO, 2023).

Overall, this study reinforces the critical role of STI prevention and management in improving pregnancy outcomes. By addressing maternal infections through comprehensive antenatal care strategies, primary healthcare facilities can contribute significantly to reducing the burden of preterm birth and advancing maternal and child health goals (Blencowe et al., 2019).

4. CONCLUSION

This study concludes that there is a significant relationship between sexually transmitted infections (STIs) during pregnancy and the incidence of preterm birth at Tomalou Primary Health Care Center. Mothers who experienced STIs were found to have a substantially higher likelihood of delivering prematurely compared to those without infections. These findings confirm the study's objective to identify the association between maternal STI status and preterm birth, emphasizing the role of infectious factors as important contributors to adverse pregnancy outcomes.

Furthermore, the results highlight the need for strengthened preventive and clinical interventions within antenatal care services. Early screening, timely treatment of STIs, and comprehensive reproductive health counseling are essential strategies to reduce the risk of preterm birth. By addressing maternal infections at the primary healthcare level, particularly in community health centers, maternal and neonatal health outcomes can be improved in line with broader public health goals.

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