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URINARY TRACT INFECTION AND THREATENED PRETERM DELIVERY IN TEENAGE PREGNANCIES OF A PERUVIAN HOSPITAL

INFECCIÓN DEL TRACTO URINARIO Y AMENAZA DE PARTO PRETÉRMINO EN GESTANTES ADOLESCENTES DE UN HOSPITAL PERUANO

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ABSTRACT

Introduction: The threatened preterm delivery can cause serious outcomes, so it is necessary to evaluate its causes. **Objective:** to determine if urinary tract infection (UTI) is a factor associated with the threatened preterm delivery in pregnant teenages at the Hospital Sergio E. Bernales 2018 – 2019. **Methods:** Observational analytical case-control study. The study included pregnant teenages admitted to the gynecology and obstetrics service of the Hospital Sergio E. Bernales 2018 – 2019. Crude and adjusted ORs were calculated for possible confounding factors based on logistic regression models. Considering the p <0.05 value as significant. **Results:** The median age was 18 years. The results of the adjusted logistic regression model were that the threatened preterm delivery had a significant association with UTI (OR = 2.68, 95% CI: 1.3–5.3) and RPM (OR = 15, 95 CI. %: 5.9–37.9). **Conclusion:** Urinary tract infection is a factor associated with the threatened preterm delivery in pregnant teens.

Key words: Preterm labor; Genital system infections; Teen; Pregnancy complications (source: MeSH NLM).

RESUMEN

Introducción: La amenaza de parto pretérmino puede causar desenlaces graves, por lo que es necesario evaluar sus determinantes. **Objetivo:** Determinar si la infección del tracto urinario (ITU) es un factor asociado a amenaza de parto pretérmino en gestantes adolescentes del hospital Sergio E. Bernales 2018 – 2019. **Métodos:** Estudio observacional analítico de casos y controles. Conformado por gestantes adolescentes internadas en el servicio de ginecobstetricia del hospital Sergio E. Bernales en 2018-2019. Se calcularon los OR crudos y ajustados para los posibles factores confusores en base a modelos de regresión logística. Considerándose el valor p<0,05 como significativo. **Resultados:** Los resultados del modelo de regresión logística ajustado mostraron que la amenaza de parto se asoció significativamente con la ITU (OR=2,68, IC 95%: 1,3–5,3) y con la presencia de ruptura prematura de membranas (OR=15, IC 95%: 5,9–37,9). **Conclusión:** La infección del tracto urinario es un factor asociado a la amenaza de parto pretérmino en gestantes adolescentes.

Palabras clave: Parto prematuro; Infecciones del sistema genital; Adolecente; Complicaciones del embarazo. (fuente: DeCS BIREME).

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INTRODUCTION

According to the World Health Organization (who), teenage pregnancy creates a social and health dilemma in the population. It is estimated that approximately one million girls under the age of 15 and 16 million women between the ages of 15 to 19 give birth annually, the vast majority of which can be seen in low-and middle-income territories[1,2].

Risks during pregnancy and childbirth are the second leading cause of death in teenagers between ages 15 to 19 worldwide. The practice of illegal abortions in this age group also contributes to an increase in maternal mortality and prolonged health problems[3]. Among the main risks faced by teenage pregnant women is the threatened preterm delivery that, without proper management, would lead to preterm birth, in addition to hypertensive diseases in pregnancy, urinary or vaginal infections, maternal mortality, among others[4,5].

In order to adequately address the threatened preterm delivery, it is necessary to know the different factors associated with the Peruvian population. Urinary infection is an important modifiable factor. According to the annual Cuban demographic in 2016, the fertility rate of women under the age of 20 was 50 per 1,000 women in that age group[6]. As for our national reality, the Ministerio de Salud (MINSA) reports that, according to the demographic and Salud Familiar (ENDES), about 200,000 women between 15 and 19 years old get pregnant annually, representing 13.4% of this population group. The "Technical Health Standard for the Comprehensive and Differentiated Care of Teenage Pregnant Women during Pregnancy, Childbirth, and Postpartum" (RM No. 007-2017 9 MINSA) supports timely care in this population group in health centers[7].

Therefore, the present study seeks to determine whether urinary tract infection is a factor associated with the threatened preterm delivery in pregnant teenagers at the Hospital Sergio E. Bernales 2018 – 2019.

METHODS

Design and setting

This study was developed in the context of the V Course-Thesis Workshop according to the published approach and methodology[8]. It consists of an observational, analytical, case, and control study, performed at the obstetrics and gynecology service of hospital Sergio E. Bernales.

Population and sample

The population consisted of all teenage patients who were hospitalized for high obstetric risk in the obstetrics and gynecology service of the Hospital Sergio E. Bernales in 2018 and 2019. Based on this, a sample size with a minimum potency of 80% was calculated. The case studies obtained were 56 and the controls 112, with the total sample size of 168 patients. Pregnant women under 20 years of age with a complete medical history were included. Pregnant women with fetal death and delivery greater than 37 weeks are excluded. The sampling was non-probabilistic.

Variables and instruments

The dependent variable was threatened preterm delivery, defined as the start of regular uterine contractions, with an interval of fewer than 10 minutes, in a gestation between 20 and 37 weeks. The independent variables were urinary tract infection, as the main independent variable, which was considered based on the medical diagnosis recorded in the clinical history. Variables such as BMI were calculated with the formula: Weight (Kg) / height^2 (m) and hemoglobin were performed by a laboratory examination. On the other hand, variables such as age, educational level, pre-eclampsia, history of preterm delivery, smoking, multiple pregnancy, premature rupture of the membrane, and prenatal controls were data obtained through the medical history.

Procedures

The thesis project was submitted to the authorities of the Universidad Ricardo Palma y the Hospital Sergio E. Bernales, with whom he referred to the president of the Research and Ethics Committee of the mentioned hospital, for their corresponding approval. Subsequently, the Hospital Archives Area was visited so that it can provide access to the medical records in question. We proceeded to collect the data in the files specifically designed for the study by reviewing the medical records belonging to the obstetrics and gynecology service, only the data necessary for the investigation were extracted from them, identifying the characteristics of the desired variables, after which the variables were tabulated in the Excel 2016 program.

Statistical analysis

After data collection, variables were tabulated in Excel

2016, so that the data could be sorted. Descriptive statistics were performed and numerical variables presented means and standard deviation or median and interquartile range in case of distribution not compatible with normal.

For the bivariate analysis, the OR with their corresponding 95% confidence intervals were found. For this purpose, univariate and multivariate logistic regression models were developed, thus identifying the raw and adjusted Odds ratio values. A $p<0.05$ was assessed as statistically significant. All analysis was performed using IBM SPSS Statistics V 22.

Ethical aspects

The research project was presented both to the research committee of the Hospital Sergio E. Bernales and the Instituto de Ciencias Biomédicas de la Universidad Ricardo Palma, where it was approved in both instances.

RESULTS

56 case studies and 112 controls were recruited. Age and prenatal controls showed a skewed distribution not compatible with a normal distribution ($p <0.001$ Shapiro Wilk).

The median age was 18 years, both in case studies and controls. Regarding BMI, a mean of 26.7 was reached with a standard deviation of ± 3.84 for the cases, while for the controls, a mean of 26.74 was obtained with a standard deviation of ± 3.91, the non-significant difference. For hemoglobin in the case studies, an average of 10.4 g / dL was obtained with a standard deviation of ± 1.97, while the controls gave an average of 10.62 g / dL with a standard deviation of ± 1.41 without significant difference. In the case of prenatal controls (NPC), the distribution was not compatible with normality. A median of 4 NPC was found in the cases and for the controls, a median of 5 was found ($p = 0.078$ for the difference), the results can be seen in Table 1.

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Table 1. Comparison of numerical variables among teenage pregnant women with a threatened preterm delivery (cases) compared with teenage pregnant women without a threatened preterm delivery Hospital Sergio E. Bernales. 2018-2019. Lima. Peru.

	Cases (n = 56)	Controls (n = 112)	p-value
Age*	18 (17-19)	18 (16.25-19)	0.266
Body Mass Index**	26.7± 3.84	26.74±3.91	0.954
Hemoglobin**	10.4 ± 1.97	10.62± 1.41	0.593
Prenatal Controls*	4 (3-5.75)	5 (3-6.75)	0.078

* Median and interquartile range (not compatible with normal distribution).
** Mean ± standard deviation (compatible with normal distribution).

It was found that the level of instruction with the highest percentage in both case studies and controls was the secondary level with 85.7% and 84.8%, respectively, with no significant difference between both groups. It can be observed that there is a statistically significant association of the threatened preterm delivery with premature membrane rupture (RPM) ($p<0.001$) with multiple pregnancies ($p=0.025$). Pregnant women with APP had a significantly higher percentage of urinary tract infections compared to controls 71.4% vs 48.2% ($p = 0.004$), the results can be seen in Table 2.

Table 2. Comparison of categorical variables between teenage pregnant women with the threatened preterm delivery (cases) compared to teenage pregnant women without the threatened preterm delivery. Hospital Sergio E. Bernales. 2018-2019. Lima, Peru.

	Cases (n = 56)	Controls (n = 112)	p-value
Education Levels			0.334
Illiterate	0 (0%)	0 (0%)	
Primary	1 (1.8%)	5 (4.5%)	
Secondary	48 (85.7%)	95 (84.8%)	
Technical	1 (1.8%)	6 (5.4%)	
Superior	6 (10.7%)	6 (5.4%)	
Preeclampsia	1 (1.8%)	3 (2.7%)	0.72
Multiple pregnancies	4 (7.1%)	1 (0.9%)	0.025
Premature rupture of the membrane	28 (50%)	7 (6.3%)	<0.001
Urinary Tract Infection	40 (71.4%)	54 (48.2%)	0.004

It can be observed that urinary tract infection was significantly associated with the threatened preterm delivery both in the crude model (OR 6.2; 95% CI 2.2-17.3; p<0.001) and in the model adjusted for the presence of multiple pregnancies and premature rupture of membranes (OR 2.68; 95% CI 1.3-5.3; p=0.005). In addition, the RPM with an adjusted OR of 15 (95% CI: 5.9–37.9) was significantly associated with the threatened preterm delivery in teenagers, the data can be seen in Table 3.

Table 3. Factors associated with the threatened preterm delivery in teenage pregnant women at the Hospital Sergio E. Bernales in the period 2018-2019. Results of the craw and adjusted logistic regression model.

	Raw			Model adjusted model		
	OR	95% CI	p-value	OR	95% CI	p-value
Urinary Tract Infection	6.2	2.2 - 17.3	<0.001	2.68	1.3 - 5.3	0.005
Premature rupture of the membrane	27.1	8.6 – 85.3	<0.001	15	5.9 - 37.9	<0.001
Multiple pregnancies	19.4	1.4 - 264.8	0.026	8.5	0.93 - 78.2	0.058

DISCUSSION

The current study confirms that urinary tract infection (UTI) is significantly associated with a considerable risk of threatened preterm delivery in teenage pregnant women treated at the Hospital Sergio E. Bernales (p=0.004). Subsequently, when performing the raw multivariate analysis (p<0.001) and adjusted (P = 0.005), this link was preserved.

This result coincides with Vega J[9], who states in his study that urinary tract infection is the main risk factor for the threatened preterm delivery. Lucio et al.[10], found that 30% of patients presented UTI (p=0.002) and that 60% occurred before 29 weeks of gestation. Faneite et al.[12], in his study, determined that urinary tract infection is a factor associated with preterm birth (OR=2.46, p=0.01, 95% CI: 1.19-5.07) and Laines P.[12] determined an OR=11.15, 95% CI: 5.02-24.81. It is concluded that urinary tract infection increases the likelihood of developing a threatened preterm delivery.

In the age group, the average age was 18 years in both cases studies and controls. When comparing with Vega J.[9] who conducted a study in teens, in which the ages with the highest incidence were 17 to 19 years old representing 50%, this age group also presented urinary tract infections in 60% and turn a high probability of threatened preterm delivery. Likewise, the Acosta-Terriquez study[12], states that the largest number of patients was 15 years of age (58%) and of Secondary Education (79%), thus coinciding with our study whose secondary education was 85.7% for the case studies and 84.8% for the controls. In the study by Lopez et al.[13] conducted in pregnant women in a naval hospital, they also found that maternal age <20 years was a factor associated with the threatened preterm delivery. Also, Lopez and Bendezu[14,15], found that pregnant women <15 years were associated with premature rupture of membranes and the threatened preterm delivery (p = 0.037).

Despite these important data, our study did not report a statistically significant association between age and threatened preterm delivery (p = 0.266); as did the level of education (p = 0.334).

In the clinical characteristic of teenage pregnant women, a BMI of about 26.7 kg/m^2 was found in both cases and controls, however, it was not statistically significant (p=0.954). Orbegoso Z.[16] also found that the most frequent BMI was <25 Kg/m^2, with no statistically significant association with urinary tract infection.

Regarding premature rupture of membranes (p<0.001) and multiple pregnancies (p = 0.025) to the threatened preterm delivery, statistical significance was evidenced. For its part, Greta Aliaga[17] found that one of the risk factors associated with preterm birth was multiple pregnancies (p=0.01). While the study by Laines P.[12], showed that 34% of cases presented multiple pregnancies (OR=4.89) and 56% of cases premature rupture of membrane (OR=1.26); which were associated with preterm delivery[18-20].

None of the pregnant women had a history of parity, because being a young population and even minors that were just beginning their sexual life[21-22].

Likewise, all the patients denied a history of tobacco use, so it was not possible to demonstrate the association with the threatened preterm delivery since, as it was a retrospective study, there could have been omission and/or denied during the medical interview, but According to what was reported in other studies, a positive relationship was found[23-26].

CONCLUSION

Urinary tract infection (UTI) is a factor associated with the threatened preterm delivery in pregnant teenagers, on the other hand, premature rupture of the membranes was also a factor associated with the threatened preterm delivery.

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