

ORIGINAL ARTICLE

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Prevalence of *Streptococcus agalactiae* rectovaginal colonization in pregnant women attended at a second level hospital in Honduras

Prevalencia de colonización rectovaginal por *Streptococcus agalactiae* en mujeres gestantes atendidas en un hospital de segundo nivel en Honduras

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ABSTRACT

Introduction: *Streptococcus agalactiae*, currently known as group B *streptococcus* (GBS) is the main microorganism that colonizes the genitourinary tract in pregnant women, causing serious consequences in the neonate, such as neonatal sepsis, pneumonia, and meningitis. **Objective:** To determine the prevalence of GBS in pregnant women at the Dr. Mario Catarino Rivas National Hospital in Honduras. **Materials and methods:** Descriptive, prospective, cross-sectional study. A total of 143 pregnant women between 34-40 weeks of gestation attended at the gynecology and obstetrics service of the Dr. Mario Catarino Rivas National Hospital in Honduras from January 2020 to June 2021 were enrolled. Cultures were developed following the methodology recommended by the Centers for Disease Control and Prevention and Strepto B chromID agar was added. Descriptive statistics were used for analysis. **Results:** The mean age of the pregnant women was 26 ± 7.4 years. The prevalence of GBS in the study population was 3.5%, with 5 positive cases. **Conclusion:** The prevalence of GBS colonization in pregnant women is variable and may not be associated with risk factors for colonization, resulting in neonatal and maternal health complications. This highlights the need for active search for group B *Streptococcus* in pregnant women. **Key words:** *Streptococcus agalactiae*, Neonatal sepsis, Pregnant women, Prevalence, Risk factors

RESUMEN

Introducción. *Streptococcus agalactiae*, conocido actualmente como estreptococo del grupo B (EGB), es el principal microorganismo que coloniza el tracto genitourinario en pacientes gestantes, llegando a causar consecuencias graves en el neonato, como sepsis neonatal, neumonía y meningitis. **Objetivo.** Determinar la prevalencia de EGB en mujeres gestantes del Hospital Nacional Dr. Mario Catarino Rivas, en Honduras. **Materiales y métodos.** Estudio descriptivo, prospectivo, transversal. Se utilizó un muestreo por conveniencia, se enroló un total de 143 gestantes entre las 34 y 40 semanas de gestación atendidas en el servicio de ginecología y obstetricia del Hospital Nacional Dr. Mario Catarino Rivas, durante enero de 2020 a junio del 2021. Los cultivos se prepararon de acuerdo con la metodología recomendada por los *Centers for Disease Control and Prevention*, agregándose el agar chromID Strepto B. Se empleó estadística descriptiva para el análisis. **Resultados.** La edad promedio de las gestantes fue $26 \pm 7,4$ años. La prevalencia de EGB en la población fue del 3,5%, encontrando 5 casos positivos. **Conclusión.** La prevalencia de colonización por EGB en mujeres embarazadas es variable y puede no estar asociada a factores de riesgo para ser colonizada, resultando en complicaciones sanitarias neonatales y maternas. Ello pone de manifiesto la necesidad de búsqueda activa de estreptococos del grupo B en las gestantes. **Palabras clave.** *Streptococcus agalactiae*, Sepsis neonatal, Gestantes, Prevalencia, Factores de riesgo



INTRODUCTION

Streptococcus agalactiae, currently known as group B *Streptococcus* (GBS), according to the Lancefield classification⁽¹⁾ is a gram-positive, β -hemolytic, facultative anaerobic, catalase-negative coccus⁽²⁾, which is usually part of the human microbiota colonizing the gastrointestinal and genitourinary tract. It is considered of great importance because it is the main risk factor for causing major infections in neonates^(3,4).

Maternal colonization is asymptomatic and has a prevalence between 10-30%⁽⁵⁾. Colonized pregnant women can transmit this microorganism via vertical transmission to 50% of the newborns during delivery, and it is reported that 1-2% develop early-onset invasive diseases such as sepsis, pneumonia or meningitis. In the mother, GBS can cause miscarriage, preterm delivery or chorioamnionitis⁽⁶⁻⁹⁾. Susceptibility to this microorganism has been difficult to correlate clinically. Some studies have associated certain risk factors that predispose to GBS colonization such as maternal age ≤ 20 years⁽¹⁰⁾, premature rupture of membranes, urinary tract infection, having had a previous delivery with a symptomatic newborn or a confirmed diagnosis of GBS^(11,12).

In developed countries, GBS infection represents the leading cause of neonatal mortality and morbidity⁽⁹⁾. According to WHO, GBS causes 150,000 preterm deliveries and infant deaths worldwide⁽¹³⁾. The Centers for Disease Control and Prevention (CDC) recommends the use of selective and specific culture media to increase GBS detection rates. Given the pathogenicity of this microorganism, it is necessary to implement screening strategies between 35-37 weeks of gestation for the detection of the microorganism and subsequent administration of antibiotic prophylaxis, an effective strategy that has succeeded in reducing early neonatal GBS infection⁽⁹⁾. Developing countries, such as Honduras, do not have mandatory screening for early detection of GBS at the public level, making clinical correlation difficult in newborns who present with fever of unknown origin at birth and who subsequently develop early-onset invasive diseases.

The prevalence of GBS in pregnant women varies depending on variables such as age, country, ethnicity, and methods used for screening⁽⁸⁾. Globally, the figure is 18%, with the highest per-

centage in the Caribbean (33%) and the lowest in Melanesia (2%)⁽²⁾. In Latin America, prevalence publications have been limited. A prevalence of 23.3% is reported in Brazil⁽¹⁴⁾, in Mexico 4-10%, in Guatemala 17.3% (15), Colombia 20.66%⁽⁹⁾, Cuba 21.1%⁽⁸⁾ and Peru 23.1%⁽¹²⁾. In Honduras, there are no reports of current GBS colonization in the region, and the clinical behavior and presence of risk factors in colonized pregnant women are unknown. Given the absence of data, the objective of the present study is to determine the prevalence of GBS in a population of pregnant women in a second level hospital such as the Dr. Mario Catarino Rivas National Hospital (HNMCR).

MATERIALS AND METHODS

A descriptive, cross-sectional, prospective research was conducted with all pregnant patients between 34-40 gestational weeks admitted to the gynecology and obstetrics service of the Mario Catarino Rivas National Hospital, between January 1, 2020, and June 30, 2021. The prevalence is unknown, so a non-probabilistic sampling by opportunistic convenience or availability was applied to a total of 143 pregnant women. Inclusion criteria were taken as pregnant patients with 34-40 weeks of gestation admitted to the gynecology and obstetrics service of the HNMCR. Patients were excluded if they had received antibiotic therapy in the 8 days prior to taking the swab, patients with chorioamnionitis, preterm labor, history of cesarean section, obvious vaginal infection, use of feminine personal hygiene products prior to taking the sample, those who were not fully mentally competent or who, after signing the informed consent document, declined to participate in the study.

The data were processed in the Statistical Package for the Social Science-SPSS version 25.0. The information was analyzed using descriptive statistics based on the analysis of frequencies and percentage values of variables. For quantitative variables, measures of central tendency and dispersion were used with a 95% confidence interval. Descriptive analysis was performed for qualitative variables.

The study was submitted to the ethics committee of the Faculty of Medicine of the Catholic University of Honduras. The research complied with the Good Clinical Practices and human research regulations of the Declaration of Helsinki



and the provisions of the general health law on research. Confidentiality of information was protected and signed consent was obtained from all participants.

RESULTS

Of the 143 pregnant women studied, the mean age was 26 ± 7.4 years (95%CI: 18-33), ranging between 13-45 years, with 18 years being the most common age. Mestizo race predominated 97.2% (n=139) and the black race accounted for 2.8% (n=4) (Table 1). Of the patients, 76.2% (n=109) were between 34-36 weeks of gestation and initiated their sexual life at an average age of 17.3 ± 3.1 years (95%CI: 11-26) (Table 2).

Of the 143 samples analyzed in bacteriology, 5 GBS-positive cases were isolated from pregnant women between 34-38 weeks of gestation who attended prenatal care, representing a prevalence of 3.5% of the total number of patients enrolled. The patients were notified but given their proximity to the delivery date they did not receive prophylactic antibiotics as the birth occurred while waiting for the bacteriology results (3 days on average). The mother-child binomial was followed up and no abnormalities were found in any of the neonates. However, one of the patients presented puerperal endometritis. The profile of the positive pregnant women according to age and gestational week was as follows: 1. 14-year-old pregnant woman (37.0 GW); 2. 18-year-old pregnant woman (37.6 GW); 3. 20-year-old pregnant woman (34.0 GW); 4. 22-year-old pregnant woman (35.0 GW); 5. 30-year-old pregnant woman (35.0 GW), coming

TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF PATIENTS WITH POSITIVE OR NEGATIVE SPECIMENS FOR GROUP B STREPTOCOCCUS COLONIZATION.

Sociodemographic characteristics	Culture results n=143 (%)		
	Positive n=5	Negative n=138	Total
Age			
13 - 25	4 (2.8)	71 (49.7)	75 (52.4)
26 - 35	1 (0.7)	46 (32.2)	47 (32.9)
36 - 45	0 (0)	21 (14.7)	21 (14.7)
Zoning			
Rural	1 (0.7)	37 (25.9)	38 (26.6)
Urban	4 (2.8)	101 (70.6)	105 (73.4)
Race/ethnicity			
Mestizo	4 (2.8)	135 (94.4)	139 (97.2)
Black	1 (0.7)	3 (2.1)	4 (2.8)

TABLE 2. GYNECOLOGY AND OBSTETRICS PROFILE OF PATIENTS WITH POSITIVE OR NEGATIVE SAMPLES FOR GROUP B STREPTOCOCCUS COLONIZATION.

Obstetrical and gynecological profile	Culture results n=143 (%)		
	Positive n=5	Negative n=138	Total
Gestational age (35.5 ± 1.6 GW ^a)			
34 - 36	3 (2.1)	106 (74.1)	109 (76.2)
37 - 40	2 (1.4)	32 (22.4)	34 (23.8)
Gestations (2.5 ± 1.7)			
1	3 (2.1)	95 (66.4)	98 (68.5)
2 or more	2 (1.4)	43 (30.1)	45 (31.5)
Beginning of sexual life (17.3 ± 3.1 years)			
11 - 18	5 (3.5)	98 (68.5)	103 (72.0)
19 - 26	0 (0)	40 (27.9)	40 (27.9)
PROM presence ^b	0 (0)	18 (12.6)	18 (12.6)
Urinary tract infections	0 (0)	2 (1.4)	2 (1.4)
Neonatal infection	0 (0)	0 (0)	0 (0)
Gestational diabetes	1 (0.7)	6 (4.2)	7 (4.9)
Type II diabetes mellitus	1 (0.7)	7 (4.9)	8 (5.6)

^a Weeks of gestation; ^b Premature rupture of membranes

from the urban area (2.8%) (n=4) and from the rural area (0.7%) (n=1).

Two of the 5 pregnant women who tested positive for GBS had diabetes, one with a history of type 2 diabetes mellitus and the second with gestational diabetes. None of the 5 colonized pregnant women had a history of urinary tract infections, premature rupture of membranes or previous delivery with a symptomatic newborn or with a positive culture for GBS. Therefore, there was no significant relationship between risk factors for GBS colonization and colonized patients, which confirms the CDC guidelines which state that most colonized women do not have risk factors. The obstetric profile of pregnant women with positive or negative cultures is summarized in Table 2.

DISCUSSION

The prevalence of GBS colonization in our study was 3.5%, lower than the 18% found worldwide and 1.1% higher than that published by Sosa and Vallecillo et al. (2006) in the most recent previous study in Honduras, carried out at the Honduran Institute of Social Security in Tegucigalpa⁽¹⁷⁾. Very variable prevalences have been found in other parts of the world. In Latin America, Rick et al. (2017) found a prevalence of 17.3% in Guatemala



la⁽¹⁵⁾, Bobadilla et al. (2021) 9.09% in Argentina⁽¹⁸⁾ and between 4.2 and 28.4% in Brazil⁽¹⁴⁾. Likewise, 37% was found in South African countries and 13.6% in Namibia⁽¹⁹⁾, 6.79% in Iran⁽²⁰⁾ and 5.7% in Japan⁽²¹⁾.

The variability in the prevalence of colonization in different geographical areas is affected by ethnicity, different methods for sample collection (such as the use of swabs and only vaginal swabs), the methods used to detect the bacteria, the unavailability of selective and chromogenic media which represents one of the fundamental limitations for the isolation of GBS^(8,15). Also, the geographical location, as shown by studies in Argentina, where a prevalence of 2.5% has been found in rural areas and 14.4% in urban areas⁽¹⁵⁾, similar to the data collected in our study, where 2.8% of the patients with positive results came from urban areas.

Regarding age, it has been found that a maternal age over 30 years is associated with an increased risk of GBS colonization, in agreement with the data presented by Nauto Ccorihuaman (2019) who indicates a higher percentage of colonization in patients aged between 31-42 years (66.7%)⁽¹²⁾. Likewise, Rick et al. (2017) shows an overall increase of 5% in the probability of GBS colonization for each year of increase in maternal age⁽¹⁵⁾, in contrast to our study in which, of 5 patients with GBS-positive samples, 4 were in the age range between 13-25 years (2.8%).

The literature mentions that colonization can be an important risk factor for the development of neonatal sepsis, highlighting the need for health units to apply standardized screening measures to detect colonization by group B *Streptococci* and constant epidemiological surveillance to detect changes in the sensitivity profiles of isolates for the prevention of neonatal infection^(3,4). On the other hand, the study by Campo et al. (2019) did not observe a significant relationship between patients with a gynecological and obstetric history of colonization risk and colonized patients⁽⁹⁾, in agreement with our study where no relationship was found between risk factors studied and GBS positivity. Of 5 positive patients, none had premature rupture of membranes, urinary tract infection or previous neonatal infection. One of the five culture-positive patients had type 2 diabetes mellitus, similar to the study by Rick et al. (2017) who, of 155 culture-positive patients, 2

had diabetes⁽¹⁵⁾. These data agree with the CDC guidelines which describe that most colonized patients do not have significant risk factors⁽⁹⁾.

CONCLUSION

The results obtained showed a 3.5% prevalence of GBS colonization in pregnant women in an isolated population of a second level hospital in Honduras. Studies with a larger population are recommended to evaluate the correlation between different risk factors and maternal GBS colonization during pregnancy in different geographical areas.

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