

Original Article

Prevalence of Group B Streptococcus Colonization During Pregnancy and Associated Neonatal Outcomes at Vachira Phuket Hospital

Ratikorn Saejong M.D.

Department of Obstetrics and Gynecology, Vachira Phuket Hospital,
Phuket, Thailand

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Correspondence to:

Ratikorn Saejong M.D.
Department of Obstetrics and
Gynecology,
Vachira Phuket Hospital,
353 Yaowarat Rd,
Mueang District,
Phuket 83000
E-mail: sratikorn.si@gmail.com
Tel: 08 9669 8613

Abstract

Background: Group B Streptococcus (GBS) colonization is a major cause of early-onset neonatal sepsis. Despite implementation of universal screening at Vachira Phuket Hospital, screening uptake and neonatal transfer rates remained concerns.

Objective: To determine GBS prevalence, evaluate screening coverage, and identify factors associated with neonatal transfer, NICU admission, and length of stay (LOS).

Materials and Methods: A retrospective cohort study included all live births at Vachira Phuket Hospital, between January 2023 and December 2024. Maternal GBS status was determined by universal or reflex culture screening. Multivariable logistic and linear regression analyses identified predictors of neonatal transfer, NICU admission, and LOS.

Results: Among 6,173 live births, overall GBS screening coverage was 27.4% (95% CI 26.3–28.5). GBS prevalence among screened women was 6.2%, higher in Thai than non-Thai mothers (6.9% vs 3.2%, $p=0.012$). Among 1,691 screened mother–newborn pairs, 49.2% of neonates required transfer and 6.7% were admitted to the NICU. Maternal GBS colonization was not associated with neonatal transfer, NICU admission, or LOS. Gestational age was the strongest predictor: each additional week reduced the risk of transfer (OR 0.8, $p<0.001$), NICU admission (OR 0.8, $p=0.013$), and shortened LOS by 2.4 days ($p<0.001$). Higher birth weight was associated with shorter LOS, while non-spontaneous delivery increased transfer risk.

Conclusion: GBS prevalence at Vachira Phuket Hospital was 6.2%, while screening coverage remained inadequate. Maternal GBS colonization was not independently associated with neonatal outcomes in this cohort, prematurity and low birth weight remained dominant determinants of adverse neonatal outcomes. However, this finding should be interpreted cautiously due to limited screening coverage and potential residual bias. The absence of association does not exclude a clinically relevant effect, and standard GBS prevention strategies should continue to be emphasized.

นิพนธ์ต้นฉบับ

ความชุกของการเป็นพาหะเชื้อสเตรปโตคอคคัสกลุ่มบีในหญิงตั้งครรภ์ และผลลัพธ์ทารกแรกเกิด โรงพยาบาลวชิระภูเก็ต

รศ.ดร. แซ่จ้อง พ.อ.

กลุ่มงานสูติ-นรีเวชกรรม โรงพยาบาลวชิระภูเก็ต

บทคัดย่อ

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คำสำคัญ:

เชื้อสเตรปโตคอคคัสกลุ่มบี,
หญิงตั้งครรภ์,
ผลลัพธ์ทารกแรกเกิด

ภูมิหลัง: เชื้อสเตรปโตคอคคัสกลุ่มบี (Group B Streptococcus; GBS) ในหญิงตั้งครรภ์เป็นสาเหตุสำคัญของภาวะติดเชื้อในทารกแรกเกิดระยะต้น แม้โรงพยาบาลวชิระภูเก็ตได้ดำเนินนโยบายคัดกรองแบบครอบคลุม แต่ความครอบคลุมการตรวจและอัตราการส่งต่อทารกไปยังกุมารแพทย์ยังเป็นประเด็นสำคัญ

วัตถุประสงค์: เพื่อศึกษาความชุกของ GBS ประเมินความครอบคลุมการคัดกรอง และวิเคราะห์ปัจจัยที่สัมพันธ์กับการส่งต่อทารก การเข้ารับการรักษาใน NICU และระยะเวลาในโรงพยาบาล

วัสดุและวิธีการ: การศึกษาแบบ retrospective cohort รวมทารกเกิดมีชีพทั้งหมดที่โรงพยาบาลวชิระภูเก็ต ระหว่างเดือนมกราคม 2566 ถึงธันวาคม 2567 สถานะ GBS ของมารดา กำหนดจากการเพาะเชื้อแบบคัดกรองทั่วไปหรือ reflex testing วิเคราะห์ปัจจัยทำนายด้วยสถิติถดถอยโลจิสติกและเชิงเส้น

ผลการศึกษา: จากทารกเกิดมีชีพ 6,173 ราย ความครอบคลุมการคัดกรอง GBS อยู่ที่ร้อยละ 27.4 (95% CI 26.3–28.5) พบความชุกของ GBS ในกลุ่มที่ได้รับการตรวจร้อยละ 6.2 พบสูงกว่าในมารดาสัญชาติไทยเมื่อเทียบกับต่างชาติ (ร้อยละ 6.9 เทียบกับ ร้อยละ 3.2, $p=0.012$) ในกลุ่มที่ทราบสถานะ GBS จำนวน 1,691 คู่ พบว่าทารกร้อยละ 49.2 ต้องส่งต่อไปยังกุมารแพทย์และร้อยละ 6.7 เข้ารับการรักษาใน NICU สถานะ GBS ไม่สัมพันธ์กับการส่งต่อทารก การเข้า NICU หรือระยะเวลาในโรงพยาบาลของทารกแรกเกิด อายุครรภ์เป็นปัจจัยสำคัญที่สุด โดยอายุครรภ์ทุก 1 สัปดาห์ที่เพิ่มขึ้นลดความเสี่ยงการย้ายทารกแรกคลอดไปยังหอผู้ป่วยเด็ก (OR 0.8, $p<0.001$) การเข้า NICU (OR 0.8, $p=0.013$) และลดระยะเวลาในโรงพยาบาลเฉลี่ย 2.4 วัน น้ำหนักแรกเกิดที่มากขึ้นสัมพันธ์กับจำนวนวันนอนโรงพยาบาลของทารกที่สั้นลง ขณะที่การคลอดที่ไม่ใช่ทางช่องคลอดปกติเพิ่มความเสี่ยงการย้ายทารกไปยังหอผู้ป่วยกุมารเวชกรรม

สรุป: พบความชุกของ GBS ร้อยละ 6.2 ในหญิงตั้งครรภ์ที่ได้รับการคัดกรอง แต่ความครอบคลุมการคัดกรองยังไม่เพียงพอ แม้สถานะ GBS ของมารดาไม่สัมพันธ์กับผลลัพธ์ทารกอย่างมีนัยสำคัญทางสถิติในการศึกษานี้ โดยปัจจัยหลักที่กำหนดผลลัพธ์ที่ไม่พึงประสงค์ของทารกยังคงเป็นภาวะคลอดก่อนกำหนดและน้ำหนักแรกเกิดต่ำ อย่างไรก็ตาม ผลการศึกษานี้ควรตีความด้วยความระมัดระวัง เนื่องจากความครอบคลุมของการคัดกรองที่จำกัดและความเป็นไปได้ของอคติ การไม่พบความสัมพันธ์ดังกล่าวไม่ได้หมายความว่าไม่มีผลทางคลินิกที่สำคัญ และยังคงควรเน้นย้ำมาตรการป้องกัน GBS ตามมาตรฐานต่อไป

Introduction

Group B Streptococcus (GBS) colonization during pregnancy is a well-established cause of early-onset neonatal sepsis (EONS) and contributes significantly to neonatal morbidity and mortality worldwide. Universal screening at 35–37 weeks' gestation and intrapartum antibiotic prophylaxis (IAP) reduce EONS by up to 80%^(1,2). However, screening coverage varies across institutions depending on resources, access to antenatal care (ANC), and population characteristics.

Vachira Phuket Hospital is one of the largest tertiary centers in southern Thailand, accounting for nearly half of all deliveries in Phuket province. Since late 2022, the hospital observed an increase in newborn transfers to the pediatric ward, reaching approximately 30% of live births, with NICU admissions around 3%. Many transferred neonates were diagnosed with early neonatal sepsis or congenital pneumonia. In response, a hospital-wide initiative was implemented in 2023 to strengthen GBS screening and reflex testing for high-risk cases.

Between 2023 and 2024, the hospital introduced universal GBS culture screening at 36 weeks' gestation, reflex testing for women presenting with preterm labor and for cases requiring neonatal transfer, standardized GBS status labeling in ANC records to reduce missed prophylaxis, and routine root-cause analysis for infants whose mothers did not receive appropriate IAP. Despite these efforts, screening uptake remained suboptimal. Many women received ANC at private or external facilities, and the population includes a substantial proportion of migrant workers, primarily from Myanmar.

This study aimed to determine GBS prevalence, assess screening coverage, describe maternal–neonatal characteristics, and identify factors associated with neonatal transfer and NICU admission. These findings may help refine local protocols and improve neonatal outcomes.

Materials and Methods

A retrospective cohort study was conducted at Vachira Phuket Hospital including all deliveries between January 2023 and December 2024. Intrauterine fetal

deaths were excluded; only live births were analyzed.

The hospital's GBS protocol included universal screening at 36 weeks for women receiving ANC at Vachira Phuket Hospital and reflex screening for women presenting in preterm labor or when neonatal transfer to the pediatric ward or NICU was required. Vaginal and rectal swabs were cultured using standard microbiological methods.

The primary outcome was the prevalence of maternal GBS colonization based on ANC and reflex testing results. Secondary outcomes included maternal characteristics and neonatal outcomes associated with GBS status.

Collected variables included maternal demographics (nationality, age, ANC site, parity), obstetric characteristics (gestational age and mode of delivery), and neonatal outcomes (birth weight, admission status, and length of stay). Maternal GBS status and IAP according to The American College of Obstetricians and Gynecologists (ACOG) guidelines—ampicillin 2 g IV loading dose followed by 1 g every 4 hours until delivery⁽³⁾—were recorded.

Statistical analysis

Sample size estimation

Sample size was calculated using an estimated GBS prevalence of 5% with 25% relative precision (absolute precision 1.25%). Based on a single proportion formula, a minimum of 1,168 participants was required. A two-week pilot study showed a prevalence of 5.37% (5/93). Allowing for 20% incomplete data, the final target sample size was 1,401 participants. Given an expected screening coverage of 25%, approximately 5,604 deliveries were required, equivalent to two years of data.

Statistical analysis

Analyses were performed using Stata MP version 18. Descriptive statistics summarized maternal and neonatal characteristics. Chi-square and t-tests were used for group comparisons as appropriate. Multivariable logistic regression identified predictors of neonatal transfer and NICU admission, while linear regression assessed factors associated with neonatal length of stay.

Neonatal transfer was defined as admission to a higher level of care (sick newborn unit, pediatric ward, or NICU). Covariates were selected a priori based on clinical relevance and included maternal GBS status (reference: negative), citizenship (reference: non-Thai), maternal age (per 10-year increase), gestational age (per 1-week increase), birth weight (per 100 g increase), and delivery route (reference: normal vaginal delivery). Statistical significance was set at $p < 0.05$.

The study was approved by the Vachira Phuket Hospital Research Ethics Committee (VPH REC 086/2024) and conducted in accordance with the Declaration of Helsinki.

Results

The study included all deliveries between January 2023 and December 2024. Of 6,206 total deliveries, 33 intrauterine fetal deaths were excluded, leaving 6,173 live births for final analysis. As shown in Table 1, 6,173 maternal–neonatal pairs were analyzed. Most mothers were Thai citizens (76.3%, $n=4,711$), while 23.7% ($n=1,462$) were non-Thai, predominantly from Myanmar. GBS screening coverage differed significantly between groups ($p<0.001$), with an overall coverage of 27.4% (95% CI 26.3–28.5). Coverage was slightly higher among Thai mothers (28.5%, 95% CI 27.4–30.0) than non-Thai mothers (23.1%, 95% CI 21.1–25.5). Among screened women, overall GBS prevalence was 6.2%, higher in Thai mothers than in non-Thai mothers (6.9 % vs 3.2%, $p=0.012$). Among GBS-positive mothers, 56.7% did not receive IAP due to post-delivery swab testing ($n=39$), elective cesarean section ($n=11$), or system errors ($n=9$). To address this gap, a red-sticker alert system was implemented to improve timely administration of prophylaxis.

Neonatal outcomes were evaluated in 1,691 mother–newborn pairs with known maternal GBS status (Table 2). Nearly half of newborns (49.2%, $n=832$) required transfer to a pediatric care unit based on predefined criteria, including tachypnea, dyspnea, hypotension, low Apgar scores, or clinical instability. Additionally, 6.7% ($n=113$) were admitted to the neonatal intensive care unit (NICU). Maternal GBS positivity

was not associated with neonatal transfer ($p=0.683$) or neonatal length of hospital stay (LOS) ($p=0.258$).

Multivariable regression analysis (Table 3) identified gestational age, birth weight, and route of delivery as significant predictors of neonatal outcomes. Each additional week of gestation reduced the risk of neonatal transfer (OR 0.8, $p<0.001$) and NICU admission (OR 0.8, $p=0.013$), and shortened neonatal LOS by 2.4 days ($p<0.001$). Higher birth weight was associated with a 0.2-day reduction in LOS per 100 g increase ($p=0.002$). Non-spontaneous delivery routes increased the risk of neonatal transfer (OR 1.3, $p=0.008$), with breech-assisted delivery showing the highest rates of transfer (64%) and NICU admission (50%). GBS status itself was not associated with neonatal transfer, NICU admission, or LOS.

Discussion

This two-year study provides updated data on GBS prevalence, neonatal outcomes, and determinants of neonatal transfer at Vachira Phuket Hospital. Despite implementation of universal screening, overall coverage remained low at 27.4%, with higher coverage among Thai mothers compared with non-Thai mothers.

The observed GBS prevalence of 6.2% may reflect fragmented ANC systems, limited access among migrant populations, and reflex testing protocols that preferentially identify higher-risk cases. Reported prevalence varies widely worldwide (0.5–16%), with 1–2% of neonates born to colonized mothers developing early-onset disease in India⁽⁴⁾. Our prevalence remains lower than the global pooled estimate of 18%⁽⁵⁾, and reports from Thailand (11–19%)^(6,7), China (9.6%)⁽⁸⁾, Kenya (12%)⁽⁹⁾, Ethiopia (15%, with 51% transmission)⁽¹⁰⁾, the United States (22%)⁽¹¹⁾, and South Africa (48%)⁽¹²⁾. Factors associated with GBS colonization include younger maternal age, Black race, non-Hispanic ethnicity, chronic hypertension, preexisting diabetes, and tobacco use.⁽¹¹⁾

GBS prevalence was significantly higher among Thai mothers (6.9%) compared with non-Thai mothers (3.2%), may reflect differences in host susceptibility and vaginal microbiota related to colonization by GBS. Variations

Table 1 Maternal, obstetric, and neonatal baseline characteristics stratified by citizenship status (N=6,173).

Data	Total (n=6,173) n (%)	Thai (n=4,711) n (%)	Non-Thai (n=1,462) n (%)	p-value
Age (years), mean±SD	29.4±6.1	29.4±6.1	31.0±5.7	<0.001
ANC place				<0.001
Private clinic	3,407 (55.2)	2,730 (58.0)	677 (46.3)	
Vachira Phuket Hospital	1,079 (17.5)	787 (16.7)	294 (20.0)	
Primary care unit	938 (15.2)	614 (13.0)	324 (22.2)	
Other Hospitals in Phuket	472 (7.7)	365 (7.8)	107 (7.3)	
Other Hospitals outside Phuket	109 (1.8)	93 (2.0)	16 (1.1)	
No ANC	168 (2.7)	122 (2.6)	46 (3.2)	
Parity (n=6,128)				<0.001
P0	2,272 (37.0)	1,737 (37.2)	535 (36.8)	
P1	2,058 (33.6)	1,519 (32.5)	539 (37.1)	
P2	1,115 (18.2)	849 (18.2)	266 (18.3)	
P>2	683 (11.2)	569 (12.1)	114 (7.8)	
Route of delivery				<0.001
Normal vaginal delivery	2,388 (38.7)	1,753 (37.2)	651 (43.4)	
Cesarean section	3,430 (55.6)	2,746 (58.3)	682 (46.8)	
Vacuum extraction	306 (5.0)	200 (4.2)	106 (7.2)	
Breech-assisted delivery	14 (0.2)	4 (0.1)	10 (0.7)	
Born before arrival	35 (0.6)	8 (0.2)	27 (1.8)	
GA at birth (weeks), mean±SD	38.2±2.0	38.2±2.1	38.5±1.9	<0.001
BW (g), mean±SD	2,998.0±524.4	2,988.1±528.9	3,036.2±508.1	0.001
GBS swab performed	1,691 (27.4)	1,351 (28.7)	340 (23.3)	<0.001
GBS positive	104 (6.2)	93 (6.9)	11 (3.2)	0.012
Newborn admission				0.005
Postpartum ward	4,309 (69.8)	3,242 (68.8)	1,067 (73.0)	
Sick newborn ward	1,664 (27.0)	1,305 (27.7)	359 (24.5)	
NICU	200 (3.2)	164 (3.5)	36 (2.5)	
Newborn LOS (days), median [IQR]	3 [3-7]	3 [3-7]	3 [2-6]	<0.001

Notes: Non-Thai citizens were primarily Myanmar nationals. ANC=antenatal care; GA=gestational age; NICU=neonatal intensive care unit LOS=length of stay; IQR=interquartile range

Table 2 Maternal demographic data and neonatal outcomes according to maternal GBS colonization status among screened mother–newborn pairs (n=1,691).

Data	Total (n=1,691) n (%)	GBS positive (n=104) n (%)	GBS negative (n=1,587) n (%)	p-value
Maternal demographic data				
Age (years), mean±SD	29.7±6.2	30.7±6.0	29.7±6.2	0.081
ANC place				0.004
Private clinic	756 (44.7)	40 (38.5)	716 (45.1)	
Vachira Phuket Hospital	541 (32.0)	36 (34.6)	505 (31.8)	
Primary care unit	200 (11.8)	11 (10.6)	189 (11.9)	
Other Hospitals in Phuket	124 (7.3)	7 (6.7)	117 (7.4)	
Other Hospitals outside Phuket	26 (1.5)	1 (1.0)	25 (1.6)	
No ANC	44 (2.6)	9 (8.7)	35 (2.2)	
Parity (n=6,128)				0.626
P0	629 (37.4)	30 (28.9)	599 (38.0)	
P1	555 (33.0)	41 (39.4)	514 (32.6)	
P2	302 (18.0)	18 (17.3)	284 (18.0)	
P>2	195 (11.6)	15 (14.4)	180 (11.4)	
Route of delivery				<0.001
Normal vaginal delivery	669 (39.6)	41 (39.4)	628 (39.6)	
Cesarean section	945 (55.9)	54 (51.9)	891 (56.1)	
Vacuum extraction	61 (3.5)	6 (5.7)	55 (3.5)	
Breech-assisted delivery	9 (0.5)	0 (0)	9 (0.6)	
Born before arrival	7 (0.4)	3 (2.9)	4 (0.3)	
Neonatal Outcomes				
GA at birth (weeks), mean±SD	37.5±2.6	37.4±2.6	37.5±2.7	0.584
BW (g), mean±SD	2868.6±632.1	2845.4±621.7	2870.1±632.9	0.699
Newborn admission				0.683
Postpartum ward	859 (50.8)	53 (51.0)	806 (50.8)	
Sick newborn ward	719 (42.5)	42 (40.4)	677 (42.6)	
NICU	113 (6.7)	9 (8.7)	104 (6.6)	
Newborn LOS (days), median [IQR]	4 [3-8]	4 [3-10]	4 [3-8]	0.258
GBS prophylaxis	357 (21.1)	45 (43.3)	312 (19.7)	<0.001

Notes: Non-Thai citizens were primarily Myanmar nationals. ANC=antenatal care; GA=gestational age; NICU=neonatal intensive care unit LOS=length of stay; IQR=interquartile range

Table 3 Multivariable regression analyses identifying factors associated with neonatal transfer, NICU admission, and neonatal length of hospital stay (n = 1,691).

Predictor	Neonatal transfer Events=832		NICU admission Events=113		Neonatal LOS (days) n=1,691	
	OR (95% CI)	p-value	OR (95% CI)	p-value	mean difference	p-value
GBS status	1.0 (0.6 to 1.4)	0.796	1.4 (0.4 to 4.8)	0.619	1.1 (-1.4 to 3.6)	0.372
Citizenship	1.1 (0.8 to 1.4)	0.575	1.2 (0.5 to 2.7)	0.696	0.2 (-1.3 to 1.7)	0.804
Age	1.0 (0.9 to 1.0)	0.065	1.0 (1.0 to 1.1)	0.205	0 (-1.0 to 0.1)	0.980
Gestational age	0.8 (0.7 to 0.8)	<0.001	0.8 (0.7 to 1.0)	0.013	-2.4 (-2.7 to -2.0)	<0.001
Birth weight	0.9 (0.9 to 1.0)	0.196	0.9 (0.9 to 1.0)	<0.001	-0.2 (-0.4 to -0.1)	0.002
Route of delivery	1.3 (1.1 to 1.5)	0.008	1.1 (1.0 to 1.8)	0.651	0.3 (-0.7 to 1.3)	0.603

Notes: Neonatal transfer combines sick newborn, pediatric ward, and NICU admissions; models adjusted for all listed covariates. GBS status (reference: negative), Citizen (reference: non-Thai), Age (per 10 years), GA (Gestational age; per 1 week), BW (Birth weight; per 100 grams), Route (Route of delivery; reference: normal vaginal delivery)

in antenatal care access and timing of screening could also influence detection rates between the two groups. Additionally, unmeasured confounding factors, such as socioeconomic status, differences in healthcare access and screening practices and prior antibiotic exposure, may partially explain the observed difference.

Maternal GBS status was not independently associated with neonatal transfer or NICU admission in this dataset. This may be due to effective neonatal monitoring, low progression to symptomatic sepsis, and conservative referral practices. Although NICU admission was slightly higher among GBS-positive neonates (8.7% vs 6.6%), the difference was not statistically significant. The lack of association between GBS status and neonatal outcomes should therefore be interpreted cautiously. Limited screening coverage reduces statistical power and may produce misclassification bias if unscreened mothers with true colonization were categorized as unknown or negative.

Additionally, neonatal outcomes were relatively infrequent events, further limiting ability to detect modest associations. further limiting ability to detect modest associations.

Gestational age emerged as the strongest predictor of neonatal transfer, NICU admission, and length of stay. This aligns with robust global evidence that prematurity is the dominant driver of neonatal morbidity, independent of GBS status. The protective effect of each additional week of gestation reinforces the primacy of maturity over colonization in determining early neonatal clinical trajectory. Similarly, higher birth weight was associated with shorter hospitalization, further supporting this maturity-related risk gradient.

Delivery route influenced neonatal transfer but not NICU admission. Assisted vaginal and breech deliveries showed higher transfer rates. The association between route of delivery and neonatal transfer should also be

interpreted in the context of clinical practice patterns. Certain delivery routes, particularly breech-assisted or operative vaginal deliveries, are often associated with increased clinical vigilance and a lower threshold for neonatal observation or transfer. In many cases, such transfers may be precautionary and related to transitional adaptation rather than underlying pathology. This may partly explain the observed association between non-spontaneous delivery and increased neonatal transfer, without a corresponding increase in severe outcomes such as NICU admission. Overall, these findings highlight the importance of considering healthcare system factors, clinical decision-making processes, and potential biases when interpreting associations observed in retrospective cohort studies.

Another key finding was that more than half of GBS-positive mothers did not receive adequate IAP. Contributing factors included post-delivery reflex testing, elective cesarean delivery without labor, and documentation gaps. During the early implementation phase, low IAP coverage was partly driven by human error—most notably, failure to review previously documented GBS results at the time of delivery—highlighting a disconnect between screening and real-time clinical decision-making. To mitigate this system-level issue, a simple intervention using color-coded stickers to indicate GBS status in antenatal records was introduced to enhance visibility and reduce missed prophylaxis.

Despite these gaps, subgroup analysis among GBS-positive women demonstrated no significant difference in NICU admission rates between those who received IAP and those who did not (8.9% vs 8.5%, $p=0.941$). Although the primary diagnoses for NICU admission were not collected in this study, contemporaneous hospital data suggested that approximately 40% of admissions were infection-related, including early-onset neonatal sepsis and congenital pneumonia. Even with a GBS prevalence of 6.2% among screened women, these findings should be interpreted with caution, as incomplete IAP coverage and residual confounding may mask a true clinical benefit. Strengthening documentation

systems and ensuring consistent identification of GBS colonization status at the point of care remain critical quality-improvement priorities.

From a health systems perspective, this study underscores the challenge of implementing guideline-based GBS prevention in heterogeneous, migrant-rich, and partially privatized ANC environments. Universal screening recommendations assume continuity of care, which may not exist in decentralized systems. Tailored strategies—such as point-of-care testing, digital ANC integration, or risk-based algorithms—may be more effective in such contexts.

A key limitation of this study is the relatively low screening coverage, which raises important concerns regarding potential selection bias. Women who underwent GBS screening may not be representative of the overall obstetric population, as screening was more likely to occur among those receiving antenatal care within the hospital system or those perceived to be at higher clinical risk. In contrast, women receiving care from external or private facilities, as well as migrant populations, were less likely to be screened. This imbalance may have resulted in a non-random subset of participants being included in the analysis of GBS prevalence and associated outcomes. Consequently, the reported prevalence of GBS colonization may not accurately reflect the true prevalence in the underlying population. It is possible that the estimate represents either an underestimation—due to missed cases among unscreened women—or an overestimation, if screening disproportionately captured higher-risk individuals. Moreover, the restriction of outcome analyses to screened mother–newborn pairs further limits generalizability and may introduce additional bias. Importantly, the lack of observed association between maternal GBS colonization and neonatal outcomes should be interpreted with caution. The combination of incomplete screening coverage, potential misclassification of colonization status among unscreened women, and relatively low event rates may have reduced the statistical power to detect clinically meaningful differences. Therefore, the findings do not necessarily indicate the absence of a true association, but rather reflect the limitations

of the available data in this retrospective cohort.

In this study, maternal GBS colonization was not independently associated with neonatal transfer, NICU admission, or length of hospital stay. However, this finding should be interpreted with caution. The relatively low screening coverage, potential misclassification of GBS status among unscreened women, and limited statistical power may have reduced the ability to detect clinically meaningful associations. Therefore, the absence of a statistically significant association in this analysis does not necessarily imply that GBS colonization has no impact on neonatal outcomes. Rather, it may reflect limitations in study design and data completeness. Given the well-established role of GBS in early-onset neonatal sepsis, continued adherence to screening and IAP remains essential in clinical practice.

Future studies with more comprehensive and systematic screening coverage, ideally within a prospective design, are needed to more accurately estimate GBS prevalence and clarify its relationship with neonatal outcomes.

Conclusion

GBS prevalence at Vachira Phuket Hospital was 6.2%, while screening coverage remained inadequate. Maternal GBS colonization was not independently associated with neonatal outcomes in this cohort, prematurity and low birth weight remained dominant determinants of adverse neonatal outcomes. However, this finding should be interpreted cautiously due to limited screening coverage and potential residual bias. The absence of association does not exclude a clinically relevant effect, and standard GBS prevention strategies should continue to be emphasized.

References

1. Ohlsson A, Shah VS. Intrapartum antibiotics for known maternal Group B streptococcal colonization. *Cochrane Database Syst Rev*. 2014;(6):CD007467.
2. Pham TT, Pham TTH, Do TD, Duong TTG. Prevalence of Group B Streptococcus colonisation and pregnancy outcomes of pregnant women at Hanoi Obstetrics and Gynecology Hospital. *Vietnam J Sci Technol Med Pharm Sci*. 2023;65(7):8–11.
3. Prevention of Group B Streptococcal early-onset disease in newborns: ACOG committee opinion, number 797. *Obstet Gynecol* 2020;135(2):e51–72..
4. Chaudhary M, Rench M, Baker C, Singh P, Hans C, Edwards M. Group B Streptococcal colonization among pregnant women in Delhi, India. *Pediatr Infect Dis J*. 2017;36(7):665–9.
5. Russell N, Seale A, O'Driscoll M, O'Sullivan C, Bianchi-Jassir F, Gonzalez-Guarin J, et al. Maternal colonization with Group B Streptococcus and serotype distribution worldwide: systematic review and meta-analyses. *Clin Infect Dis*. 2017;65(suppl 2):S100–11.
6. Akkanesermsaeng W, Petpichetchian C, Yingkachorn M, Sasithorn S. Prevalence and risk factors of group B Streptococcus colonisation in intrapartum women: a cross-sectional study. *J Obstet Gynaecol*. 2019;39(8):1093–7.
7. Khamching C, Anusorn A, Srisupundit K. The prevalence of Group B Streptococcus (GBS) colonization in pregnant women. *J Med Assoc Thai* 2017;100(11):1162–6.
8. Liu Y, Liu W, Zhuang G, Liu W, Qiu C. Colonisation of Group B Streptococcus and its effects on pregnancy outcomes in pregnant women in Guangzhou, China: a retrospective study. *BMJ Open*. 2023;13(11):e078759.
9. Seale A, Koech A, Sheppard A, Barsosio H, Langat J, Anyango E, et al. Maternal colonization with Streptococcus agalactiae and associated stillbirth and neonatal disease in coastal Kenya. *Nat Microbiol*. 2016;1:16067.
10. Bekele H, Debella A, Getachew T, Balis B, Tamiru D, Eyeberu A, et al. Prevalence of Group B Streptococcus recto-vaginal colonization, vertical transmission, and antibiotic susceptibility among pregnant women in Ethiopia: a systematic review and meta-analysis. *Front Public Health*. 2022;10:891163.
11. Edwards J, Wynn C, Watson N, Focht C, Todd C, Walter E, et al. Group B Streptococcus (GBS) colonization and disease among pregnant women: a historical cohort study. *Infect Dis Obstet Gynecol*. 2019;2019:5430493.

12. Lekala LM, Mavengwa R, Moyo S, Lebelo S, Bolukaoto J, Chukwu M, et al. Risk factors associated with Group B Streptococcus colonization and their effect on pregnancy outcome. J Gynecol Obstet. 2015;3(6):121–8.