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Research Article

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Need for Intrapartum Antibiotic Prophylaxis in Women with Prior History of Group B Streptococcus Carriage

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Abstract

The incidence of early onset neonatal GBS(EOGBS) disease in the UK and Ireland is 0.57/1000 births. Intrapartum antibiotic prophylaxis (IAP) reduces the risk. Previous colonisation is associated with 50% carriage in the current pregnancy. In these women, RCOG recommends IAP with a history of neonatal infection, otherwise offering the option of screening at 35-37 weeks. In Ireland, there is no national consensus on IAP in prior GBS colonisation. Currently at University Hospital Waterford (UHW), all women with prior GBS colonisation receive IAP. Studies examining the use of point-of-care testing have shown reduction in the use of IAP and EOGBS rates.

We aimed to examine the screening and IAP administration in maternal prior GBS colonisation and the incidence of GBS in this cohort in UHW.

Data was collected retrospectively from laboratory, medical records and electronic patient manager systems. Women who received IAP between 1stJuly 2020 and 31stDecember 2020 were identified. Women who received IAP for current and prior GBS colonisation were included. Women who received IAP for preterm labour, preterm prelabour rupture of membranes and pyrexia in labour were excluded.

Ninety-two women with current or prior GBS colonisation received IAP, of which only 15(16.30%) were current and 77(83.69%) were prior GBS colonisation. In women with prior GBS colonisation, 49(63.63%) were screened, 3/49(6.12%) were positive, 28 were not screened. Seventy-eight (84.78%) received benzyl-penicillin. Six (6.52%) received clindamycin. Twenty-two (23.91%) babies were admitted to the Neonatal Unit, however, only one cultured positive for gram-positive cocci.

The incidence of EOGBS in this cohort is low. A risk-based approach or point-of-care testing should be considered to reduce unnecessary IAP administration.

Keywords: GBS, Intrapartum antibiotic prophylaxis, Early onset neonatal sepsis, Pregnancy

Introduction

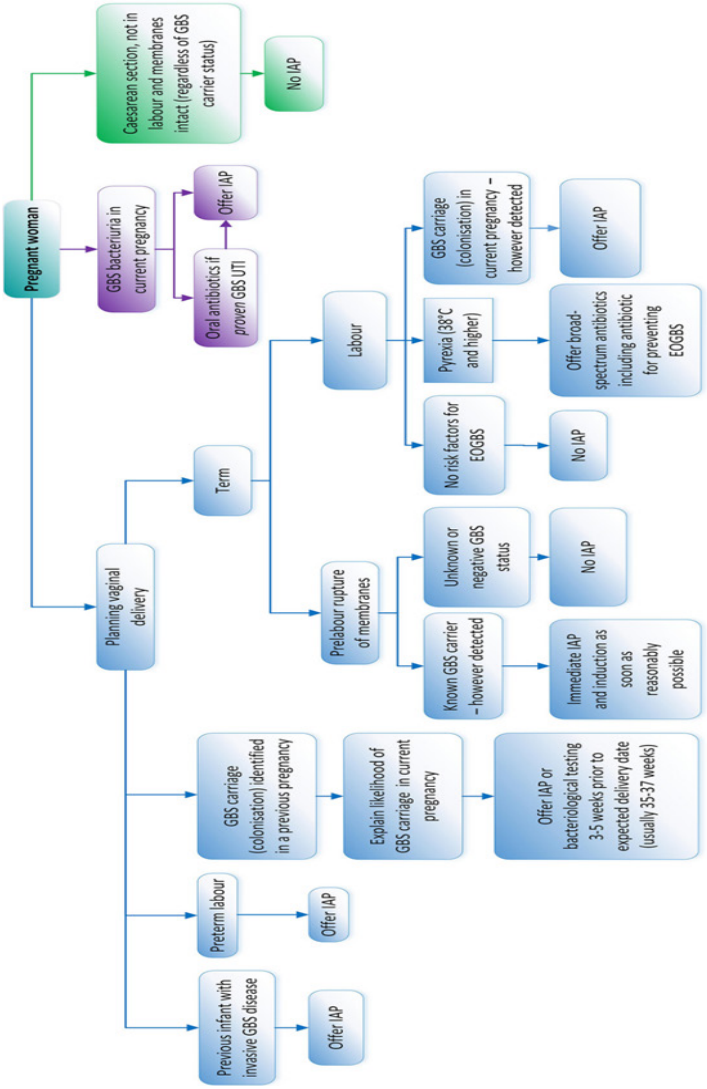
Neonatal sepsis can be classified as early onset (within 7 days of age) and late onset (day 7 of life or later). The most common cause of early onset infection is Lancefield group B streptococcus infection affecting 1 in every 1750 new born babies in the UK and Ireland [1]. Although a decrease in incidence is seen with the widespread use of intrapartum antibiotic prophylaxis, the adverse effects of extensive antibiotic use should not be overlooked [2].

GBS is estimated to be present in the bowel or vaginal flora of 1 in 5 pregnant women in the UK [3]. GBS infection in neonates can cause sepsis, pneumonia and meningitis which can result in long term physical or mental disability if not treated promptly and even death. Risk factors for early onset GBS infection includes history

of the previous baby affected by early onset GBS, GBS bacteriuria, positive vaginal swab, maternal pyrexia, preterm birth, prolonged rupture of membranes, and suspected maternal intrapartum infection [4].

Royal College of Obstetrics and Gynecology, UK recommends use of intrapartum antibiotic prophylaxis for mothers with risk factors for GBS with benzylpenicillin. Provided the woman has not had severe allergy to penicillin, cephalosporin should be used. If there is evidence of severe allergy to penicillin, vancomycin should be used [4]. Use of clindamycin in the setting of severe penicillin allergy is no longer recommended because of increased resistance, which means that neonates are still potentially at risk if clindamycin is used. Universal bacteriological screening is not recommended [4]. For women with a previous history of GBS the option of IAP or testing between 35-37 weeks and offering IAP if positive should be discussed [4]. (Appendix I)

Appendix I:Pathway of care, Prevention of Early-onset Neonatal Group B Streptococcal Disease, Green-top Guideline No. 36



Currently in University Hospital Waterford, all women with risk factors for EOGBS are offered intrapartum antibiotic prophylaxis with benzylpenicillin, provided women are not allergic. Those who are allergic to penicillin are universally given clindamycin. Women with previous history of GBS carriage are also offered IAP regardless of GBS status in current pregnancy. The risk of EOGBS in this circumstance is 1 in 700 to 1 in 800 [5]. This intervention exposes mother and baby to harmful effects of antibiotics including severe maternal allergic reaction, increase in drug resistance with exposure of baby to resistant bacteria, and postnatal maternal and neonatal thrush [2].

Studies examining the use of point of care testing has shown reduction in rate of EOGBS and use of antibiotics [6]. Use of Intrapartum real-time PCR can avoid unnecessary IAP compared to antepartum culture-based testing [7]. Point of care testing is not widely available and is considered costly but studies have shown it to be cost effective, due to shorter hospital stay and reduction in GBS treatment costs [6].

The aim of this study is to see the incidence of EOGBS in babies of mothers with GBS carriage in current and previous pregnancy, mainly to focus on women with previous history of GBS and their need for IAP. This is with an aim to devise a local policy in line with RCOG and NICE guideline, to avoid side effects of antibiotics on mother and baby, and to optimise the use of IAP.

Methods

We conducted a retrospective cohort study among all the women delivered in University Hospital Waterford between July 2020 and December 2021. On an average 1800 babies are born per annum in University Hospital Waterford. We collected retrospective data in collaboration with the microbiology department to trace all the women positive for GBS in current or previous pregnancy.

In UHW, women are routinely not screened for GBS through a vaginal swab in the antenatal period. Women who present to outpatient's clinic and labour ward with various complaints including vaginal discharge, bleeding or spontaneous rupture of membranes are opportunistically screened for GBS with a high vaginal swab for culture and sensitivity. Women are screened for a previous history of GBS at booking visits as part of routine booking questionnaire. All women screened positive for current or prior carriage of GBS are given intrapartum antibiotic prophylaxis during labour to prevent EOGBS in neonates.

We identified women who received IAP between 1st July 2020 and 31st December 2020. Women who received IAP for current and prior GBS colonisation were included. Women who received IAP for preterm labour, preterm prelabour rupture of membranes and pyrexia in labour were excluded. We also identified women with prior GBS carriage who were opportunistically swabbed for GBS in current pregnancy and came out to be negative for GBS.

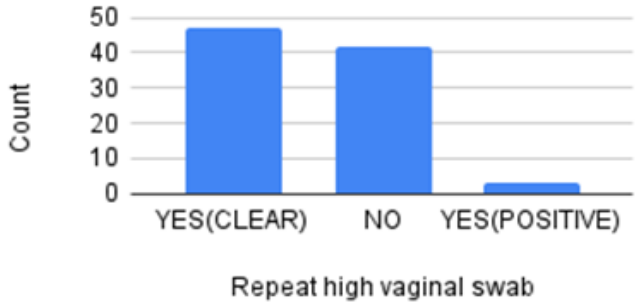
Data was collected retrospectively from laboratory, medical records and electronic patient manager systems. We reviewed medical charts for the type of antibiotic used for IAP and the reason for its use. Neonatal outcome was observed in terms of babies who stayed with mothers on postnatal ward and babies admitted to special care baby unit, high dependency unit and neonatal intensive care unit. We used the patient manager system to identify babies who were investigated for GBS. We also obtained an algorithm for management of new-born infants with risk factors for early onset sepsis in our neonatal unit. Data was processed and kept on a password protected computer. Statistical techniques were used to analyse the collected data. We analysed the data retrospectively as a part of clinical audit, for which local Research Ethics Committee approval was not required.

Results

Ninety-two women were included in our study with current or prior GBS colonisation delivered in UHW during July 2020 to December 2020. Women received IAP for GBS carriage. 15(16.30%) with current and 77(83.69%) with prior GBS colonisation were identified. A high vaginal swab performed by a doctor or a midwife during an antenatal or labour ward visit was positive for 88/92 women. 4/92 women had a urine culture and sensitivity report positive for GBS. Treatment for a GBS bacteriuria is given with growth of greater than 105 cfu/ml .

The cohort of women with prior GBS colonisation was followed for a repeat screening high vaginal swab for GBS. Forty-nine (63.63%) were screened, 3/49(6.12%) were positive, 28 were not screened (Figure 1). Forty-six women were negative for GBS on a repeat swab but still received IAP as per department policy.

Figure 1



Seventy-seven (83.7%) received benzyl-penicillin as a first line antibiotic used for GBS prophylaxis. Six (6.5%) received clindamycin, seven (7.6%) did not receive any antibiotics because of precipitous labour or elective caesarean section, whereas two (2.2%) received broad spectrum antibiotics for suspected chorioamnionitis (Table 1). Among women who received clindamycin, four were documented to be allergic to penicillin whereas only two revealed a rash to penicillin exposure previously as documented in the medical charts.

Table 1: Frequency of different antibiotics used for IAP.

Type of IAP	Frequency
Broad spectrum antibiotic	2
Benzylpenicillin	77
Clindamycin	6
Nil	7
Grand Total	92

Neonatal outcome was noted in the form of admissions to neonatal unit and subsequent management. Apgar score is routinely calculated for all babies at birth in UHW. Most of the babies were delivered with a good Apgar score (Table 2). Fifty-nine (64.1%) babies stayed with mothers on postnatal ward whereas twenty-two (23.91%) babies were admitted to the Neonatal Unit. Fifteen (16.3%) babies were admitted to neonatal HDU, four (4.3%) to NICU and three (3.3%) to SCBU (Figure 2). Eleven (12%) babies presented in paediatric emergency after postnatal discharge from hospital, during early and late neonatal period. Septic screen was requested for eighteen babies, however, only one cultured positive for gram-positive cocci.

Figure 2

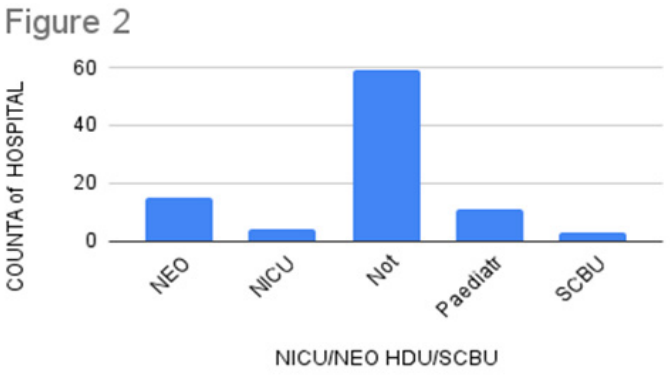


Table 2: Frequency of Apgar score at birth

Apgar score at one minute and five minutes	Frequency
Apgar 6,10	1
Apgar 6,8	1
Apgar 7,10	1
Apgar 8,10	3
Apgar 9,10	85
Apgar 9,9	1

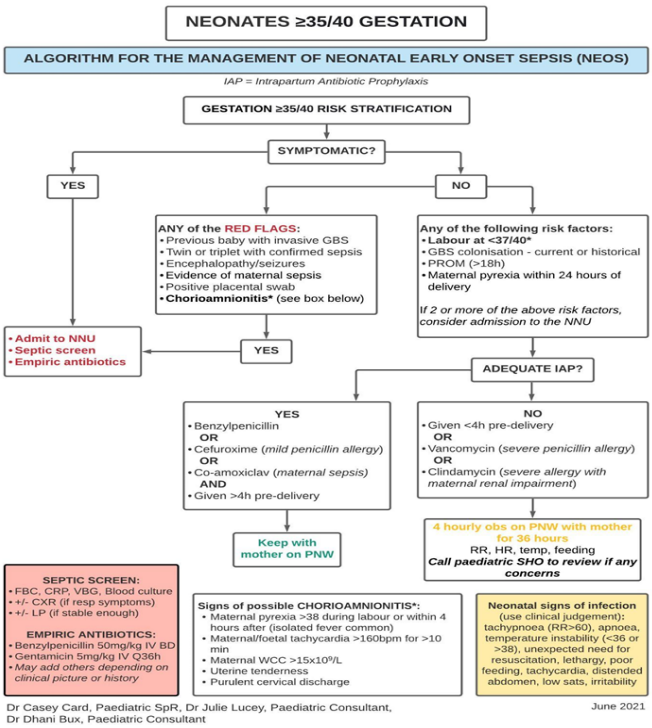
Discussion

In our study a total of ninety-two women received intrapartum antibiotic prophylaxis during a time period of six months, this included all the women with current or prior GBS carriage. Our main focus was these women with prior GBS carriage n=77/92,

forty-nine were opportunistically screened and only three turned out to be positive for GBS, forty-six women who came negative for GBS culture still received the intrapartum antibiotics. Twenty-eight women were not screened in their current pregnancy. This highlights a lack of adherence to guidelines.

In our study 84.78% women received benzylpenicillin whereas 6.52% received clindamycin. Penicillin remains the drug of choice for intrapartum prophylaxis because of its targeted action against GBS [8]. Clindamycin is no longer recommended because of an increased resistance rate at around 16% in the UK [5]. One of the positive outcomes of our study was that our surveillance scientist looked at GBS isolates from vaginal swabs from obstetric patients in UHW Jan 2019-Jan 2021 and found that 22.5% (41/182) of isolates were clindamycin resistant. When isolates from neonates were included the rate was 25.2% (59/234). Based on these numbers, a change was implemented from clindamycin to the use of cefuroxime for patients with non-severe penicillin allergy and vancomycin for the severe allergies [4, 9]. This change was made not only to ensure an appropriate antibiotic cover but also to prevent admission to neonatal units for alternative antimicrobial cover in the immediate postpartum period. This trend was also shown in our study where 23.91% babies were admitted to neonatal unit however only one cultured positive for gram positive cocci. With a change in this policy, we are expecting reduced neonatal unit admissions, which can disrupt mother infant bonding during the critical postpartum period. A new algorithm was devised for management of neonatal early onset sepsis by the neonatology department as well. (Appendix II)

Appendix II: New Algorithms: Neonatal Early Onset Sepsis, Neonatology Department, University Hospital Waterford.



The incidence of early onset GBS in the UK and Ireland is 0.57/1000 live births in 2014-15 [5]. A study conducted in the Northern Ireland maternity unit in 2008-2010 showed incidence of EOGBS to be 0.57/1000 live births. This study looked at the uptake of guidelines for prevention and management of GBS and found a 50-70% adherence to the RCOG guideline [10]. Another study conducted to look into the standards for prevention of GBS in nineteen maternity units in Ireland and found that only one unit performs routine antenatal screening at 35-37 weeks and two units used GeneXpert rapid PCR testing for GBS detection [11].

GBS colonization in index pregnancy is associated with a 50% carriage in current pregnancy [12, 13]. A number of factors have been identified which are associated with increased risk of EOGBS apart from GBS carriage in current pregnancy including preterm birth, prolonged rupture of membranes, having another child with EOGBS, and chorioamnionitis [14, 15]. Some guidelines recommend universal screening (culture-based screening) in the third trimester for GBS prevention whereas others recommend risk-based screening [8, 4]. A meta-analysis of seventeen studies revealed lower incidence of EOGBS with screening based protocols compared to risk based protocols and without increased use of antibiotics [16].

Inadequate IAP results in unnecessary admissions in neonatal units. In University hospital Waterford, a risk-based approach is adopted in the neonatal unit as well. Babies of women with current or prior or current GBS carriage are considered for NNU admission if another risk factor is identified such as preterm labour less than 37 weeks, prelabour rupture of membranes greater than 18 hours and maternal pyrexia within 24 hours of delivery. In such cases if adequate IAP is given, the baby is kept with the mother, otherwise four hourly observations of vital signs are done for 36 hours. (Appendix II)

In conclusion, the need for prevention of GBS should be balanced against unnecessary use of antibiotics to prevent side effects and resistance. Our study highlights the need for a national guideline for prevention of EOGBS and implementation of the same in maternity units.

References

1. Lancefield RC (1928) The antigenic complex of streptococcus hæmolyticus: I. Demonstration of a type-specific substance in extracts of streptococcus hæmolyticus. J Exp Med 47: 91-103.
2. Moore MR, Schrag SJ, Schuchat A (2003) Effects of intrapartum antimicrobial prophylaxis for prevention of group-B-streptococcal disease on the incidence and ecology of early-onset neonatal sepsis. Lancet Infect Dis 3: 201-213.
3. Jones N, Oliver K, Jones Y, Haines A, Crook D (2006) Carriage of group B streptococcus in pregnant women from Oxford, UK. J Clin Pathol 2006; 59: 363-366.
4. Hughes RG, Brocklehurst P, Steer PJ, Heath P, Stenson BM (2017) on behalf of the Royal College of Obstetricians and Gynaecologists. Prevention of early-onset neonatal group B streptococcal disease. Green-top Guideline No. 36. BJOG 124: 280-305.
5. O'Sullivan C, Lamagni T, Efstratiou A, Patel D, Cunney R, et al. (2016) P3 Group B Streptococcal (GBS) disease In UK

and Irish infants younger than 90 days, 2014–2015. Arch Dis Child 101: A2.
6. El Helali N, Habibi F, Azria E, Giovangrandi Y, Autret F, et al. (2019) Point-of-Care Intrapartum Group B Streptococcus Molecular Screening: Effectiveness and Costs. Obstet Gynecol 133: 276-281.
7. Plainvert C, El Alaoui F, Tazi A, Joubrel C, Anselem O, et al. (2018) Intrapartum group B Streptococcus screening in the labor ward by Xpert® GBS real-time PCR. Eur J Clin Microbiol Infect Dis 37: 265-270.
8. Prevention of Group B Streptococcal Early-Onset Disease in Newborns: ACOG Committee Opinion Summary, Number 797. Obstet Gynecol. 2020 135: 489-492.
9. Towers CV, Weitz B (2018) Transplacental passage of vancomycin. J Matern Fetal Neonatal Med 31: 1021-1024.
10. Eastwood KA, Craig S, Sidhu H, Boyle M, Gannon C, et al. (2015) Prevention of early-onset Group B Streptococcal disease-the Northern Ireland experience. BJOG 122: 361-367.
11. A Dakin A, Ferguson W, Drew R, McCallion N, Higgins MF, et al. (2021) Assessing standards for prevention of early onset group B streptococcal (GBS) disease in Ireland. Ir J Med Sci 14: 1-7.
12. Colicchia LC, Lauderdale DS, Du H, Adams M, Hirsch E (2015) Recurrence of group B streptococcus colonization in successive pregnancies. J Perinatol 35: 173-176.
13. Turrentine MA, Colicchia LC, Hirsch E, Cheng PJ, Tam T, et al. (2016) Page-Ramsey SM. Efficiency of Screening for the Recurrence of Antenatal Group B Streptococcus Colonization in a Subsequent Pregnancy: A Systematic Review and Meta-analysis with Independent Patient Data. Am J Perinatol 33: 510-517.
14. Puopolo KM, Draper D, Wi S, Newman TB, Zupancic J, et al. (2011) Estimating the probability of neonatal early-onset infection on the basis of maternal risk factors. Pediatrics 128: 1155-1163.
15. Benitz WE, Gould JB, Druzin ML (1999) Risk factors for early-onset group B streptococcal sepsis: estimation of odds ratios by critical literature review. Pediatrics 103: 77.
16. Hasperhoven GF, Al-Nasiry S, Bekker V, Villamor E, Kramer B (2020) Universal screening versus risk-based protocols for antibiotic prophylaxis during childbirth to prevent early-onset group B streptococcal disease: a systematic review and meta-analysis. BJOG 127: 680-691.