GBS SCREENING: RISK FACTOR-BASED APPROACH ENHANCED BY RT-PCR AN AUDIT IN MATERNITY UNIT, UHW

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BACKGROUND

Group B Streptococcus (GBS) exists as part of normal flora – colonising the genital tract in approximately 10-30% of women. This is relevant as GBS remains the leading cause of severe neonatal morbidity and mortality. 36% of babies born to colonised mothers will subsequently become colonised at birth and 1-3% of these may develop early-onset GBS (EOGBS).

According to the NWHIP Guideline, it is important to identify groups of women at risk and implement appropriate risk reduction measures including screening for GBS and appropriate use of intrapartum antibiotic prophylaxis (IAP) when indicated. There are currently no national standard on GBS screening across all maternity units in Ireland and the guideline included 3 separate screening algorithms and approaches.

In UHW, GBS screening is carried out as per Recommendation 1.2 as outlined in Figure 1 – risk factor-based approach enhanced by RT-PCR testing of those at highest risk of prolonged rupture of membranes e.g. induction of labour (IOL) and pre-labour rupture of membranes (PROM).

Figure 1: Screening algorithm used locally in UHW

AIM

- To assess the compliance and clinical utility of RT-PCR testing to detect GBS
- To investigate the level of agreement between different test modalities;
  (i) RT-PCR of low vaginal and rectal swab
  (ii) high vaginal swab (HVS) collected for culture and sensitivity (C+S)

in Maternity Unit, UHW over 6 months, (April – October 2024).

METHODOLOGY

- Study design: Retrospective study of all women who underwent RT-PCR screening for GBS for 6 months (April – October 2023)
- Data collection: data pool obtained from Microbiology Lab Database on RT-PCR tests requested for the study duration. There were 215 RT-PCR samples received and 4 tests were excluded due to invalid result and duplication. The remaining 211 RT-PCR tests were used for the audit
- Variables analysed: RT-PCR test indication, concurrent testing with HVS for C+S, results of both test modalities if applicable and patient's history of GBS infection based on laboratory database (WebLab) record
- Data analysis: performed using Microsoft Excel

RESULTS

There were 211 RT-PCR tests included for the audit and 20.4% (n=43) was found to be GBS-positive. This is in keeping with the national incidence quoted at 10-30%.

To assess the compliance and clinical utility of RT-PCR testing for GBS screening, further analysis were carried out on the test indications – intrapartum, history of GBS infection (in index pregnancy and prior to index pregnancy respectively), preterm and unspecified. Of note, a significant proportion of test requests were remarked with more than one indication particularly being intrapartum and having history of GBS infection, justifying the overall percentage for different test indications exceeding 100%.

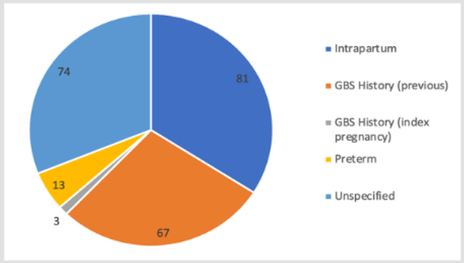

Figure 2: Indications for GBS screening using RT-PCR

As shown above, majority (n=81, 38.4%) of the tests were done intrapartum which included cases of IOL, PROM and spontaneous rupture of membrane (SROM). The second frequent reason for screening were for history of GBS infection prior to index pregnancy (n=67, 31.8%), followed by preterm (n=13, 6.2%) and history of GBS infection in index pregnancy (n=3, 1.4%). And a substantial proportion (n=74, 35%) of the RT-PCR screening tests performed unfortunately included no specific reason.

Referring to NWHIP screening algorithm, it is recommended to offer IAP to women with preterm labour and GBS infection detected in current pregnancy, among others with risk factors. The audit identified 16 women had screening performed despite being categorised as at risk groups that would appropriately be offered IAP regardless of screening results. Similarly, 67 patients undergone screening on their attendance to delivery suite due to prior GBS history when NWHIP algorithm suggests either offering IAP or repeat RT-PCR antenatally 3-5 weeks prior to expected delivery. This finding to some extent reflects inappropriate screening practice.

Additionally, the audit also included the use of 2 different test modalities for GBS screening; low vaginal and rectal swab for RT-PCR as a standard approach, alongside use of HVS for C+S. In approximately one-third of the time (n=62), GBS screening was performed using concurrent testing with both RT-PCR swab and HVS for C+S.

There was inconsistency of results noted; among all RT-PCR screening tests that detected GBS (n=43), 15 of the patients also had concurrent screening with HVS and only 40% (n=6) showed consistent positive finding on the C+S. The remaining HVS screening (n=9) had no growth on C+S despite GBS detection on patients screened using RT-PCR testing. On the other hand, there were 47 HVS tests for C+S performed concurrently on patients whom screening using RT-PCR was negative for GBS. Comparing results from both screening modalities revealed 100% level of agreement with all HVS samples showing no growth.

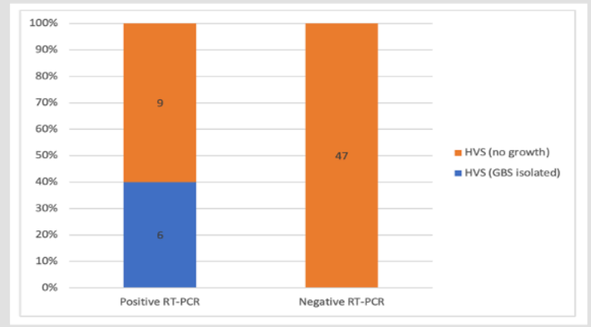

Figure 3: Proportion of agreement and disagreement between screening results using RT-PCR and HVS C+S

CONCLUSION

The local incidence of GBS in UHW as identified through this audit is 20.4% which aligns with the national incidence of 10-30%. Due to its high prevalence and associated neonatal morbidity and mortality, it is essential to comply to NWHIP recommendation on appropriate GBS screening and offering IAP when indicated.

It was noted that a substantial proportion (35%) of screening were performed with no specified indications which reveals gaps in assessing compliance and clinical utility of RT-PCR testing – it is unknown whether tests were requested inappropriately or simply due to lack of documentation.

Comparing 2 different test modalities for GBS screening, RT-PCR has higher sensitivity than HVS C+S in detecting GBS with 40% concordance. RT-PCR also appears having excellent negative predictive value and could reliably exclude GBS colonisation with 100% level of agreement with HVS C+S. As RT-PCR also has a significantly shorter turnaround time, there is clearly no apparent benefit of performing concurrent testing in screening for GBS.

There are few factors identified limiting the audit including lack of systematic documentation and reliance on manual recording on paper. This can be improved by promoting a better documentation practice particularly on screening indication when RT-PCR is requested. A few areas of extension identified to improve the audit include association with method of delivery in cases of GBS positive, relevant neonatal morbidity and mortality if any, and economic analysis on RT-PCR testing and IAP use.