CONSENSUS GUIDELINE 2014

THE PREVENTION OF EARLY-ONSET NEONATAL

GROUP B STREPTOCOCCUS INFECTION

The New Zealand College of Midwives

The Paediatric Society of New Zealand

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (New Zealand Committee)

Australasian Society of Infectious Diseases – New Zealand Sub-committee

Background

Early-onset neonatal group B streptococcus (EOGBS) infection is acquired by the baby by vertical transmission from the birth canal around the time of birth and is an important and largely preventable public health problem.

Two strategies for identifying women at increased risk of giving birth to an affected baby have been used; one based on universal antenatal screening and the other on clinical risk factors. In both strategies, mothers identified as at risk are offered appropriate intravenous antibiotics from when labour is established. This intrapartum antibiotic prophylaxis (IAP) has been shown to be effective in preventing vertical transmission of GBS.

In 2004, an expert multidisciplinary group reviewed the evidence on IAP and the results of a national two year surveillance study of EOGBS in New Zealand (1998-9). The group agreed a set of guidelines appropriate for New Zealand, which recommended a risk factor based prevention strategy.[1]

A repeat national two year study of EOGBS infection was completed in 2011 through the New Zealand Paediatric Surveillance Unit. This showed that the incidence of EOGBS had halved in the 10 years since the first survey and was 0.25 per 1000 (95% CI 0.17-0.33). The survey also found there were missed opportunities for preventing GBS infection. [2]

In 2012 the multidisciplinary group was reconvened to review the current literature and the NZ data. The group considered that the adoption of a national guideline by all practitioners and District Health Boards (DHBs) has the potential to improve prevention of EOGBS infection.

The group noted that the most recent recommendation from N. America[3] was for universal screening, whilst that from the UK[4] was for a risk-based approach. Neither will prevent all cases of EOGBS and factors such as the practicalities and cost-effectiveness need to be considered. Screening has to be carried out at the right time (35-37 weeks) with the correct technique (vaginal and anorectal swab), reach the laboratory where selective media and enrichment broth are

required, and the results need to be available and acted upon. A recent study[5] has shown that 10% of women with negative screening were actually positive for GBS when in labour, whilst 50% of women with a positive screen result were negative for GBS when in labour. The screening approach is more expensive and exposes more women to antibiotics than the risk-based approach. Lastly, it is likely that the approach to GBS prevention will need to be reviewed again and potentially significantly altered as rapid diagnostic testing in labour and maternal immunization are developed and become cost-effective.

The following guidelines on the prevention and management of early onset group B streptococcus (EOGBS) infection represent the consensus statement from this group.

Recommendations

1. A risk-based GBS prevention strategy continues to be recommended for New Zealand, as it is the most clinically and cost effective for the New Zealand context. Universal routine antenatal GBS screening is not recommended.

Risk factors

The risk-based approach recommends that all women with one or more of the following factors be offered intrapartum intravenous antibiotics:

a) a previous GBS-infected baby
b) GBS bacteriuria of any count during the current pregnancy
c) preterm (<37 weeks) labour and imminent birth
d) intrapartum fever $\geq 38^0$C
e) membrane rupture $\geq$ 18 hours

2. Women who have had an incidental finding of GBS on a vaginal swab earlier in pregnancy need to have this repeated between 35-37 weeks. If this has not occurred then this should be considered a risk factor and she should be offered IAP[4].

2. All maternity providers need be updated about these current GBS recommendations, to improve practice and outcomes, and achieve national equity.

3. All hospitals should have an accessible and agreed protocol, based on the current recommendations and which should be followed by all practitioners.

4. GBS information needs to be developed for pregnant women and their whanau/family, using both written and web-based material. Accurate and appropriate information will help decision making.

Practical Applications

ANTENATAL MANAGEMENT OF GROUP B STREPTOCOCCUS

1. Incidental finding of GBS on vaginal swab

An incidental finding of vaginal and/or rectal GBS colonisation during pregnancy does not require treatment with antibiotics antenatally as GBS cannot be eliminated from its reservoir in the large bowel.

An incidental finding of GBS in pregnancy greater than 5 weeks before labour is unreliable [3,6] and may result in unnecessary intervention in labour.

If the woman has had a previous GBS-infected baby or GBS bacteriuria in the current pregnancy she should be offered IAP.
In other cases, it is recommended the woman is re-swabbed at 35-37 weeks' gestation if an incidental finding has occurred, using the following technique:

- **Low vaginal and rectal swab** (use same swab for both; clinician or patient collected)
- **The request form must clearly state "GBS screen" and "use selective broth process".**

This result informs labour management. If this swab returns positive the woman should be offered IAP. If the swab returns with no evidence of GBS colonisation, intrapartum prophylaxis is not required.[3] (However, if intrapartum fever occurs there should be an assessment for chorioamnionitis).

If the woman has had an incidental vaginal GBS positive swab early in the current pregnancy and has **not** been re-swabbed at 35-37 weeks, this should be considered a risk factor and she should be offered IAP[4].

2. GBS bacteriuria or GBS urine infection during pregnancy

GBS bacteruria of any count and at any stage in pregnancy is a risk-factor for early onset GBS infection. Most experts will only treat the bacteruria with appropriate antibiotics when the colony count is $>10^5$ colony forming units.ml. [3, 7]

There is no need to take or repeat a GBS vaginal swab when GBS bacteriuria has been diagnosed – this is a sufficient risk-factor in itself.

Intrapartum antibiotic prophylaxis is recommended even when GBS bacteriuria has been successfully treated. (The only exception to this is if caesarean delivery is performed before the onset of labour in a woman with intact membranes).

PRINCIPLES OF GBS MANAGEMENT IN LABOUR

All women with risk factors for early onset neonatal GBS infection (listed above) should be offered treatment, when labour commences, with intravenous intrapartum antibiotic prophylaxis (IAP)**. Oral antibiotics are ineffective in this context**

Women with clinical signs of (chorio)amnionitis require immediate treatment with intravenous broad spectrum antibiotic therapy, instead of the prophylaxis regimen.

Intrapartum antibiotic prophylaxis is intended to have a narrow spectrum, to reduce the risk of antibiotic resistance and unwanted side effects.

Penicillin allergy may be significant in this context. Penicillin allergy may occur in 0.7%-4% (usually a maculopapular rash) but the risk of anaphylaxis is estimated to be in the range of 4/10,000 to 4/100,000.[3] Documentation of details of any previous, immediate (within 24 hours), hypersensitivity reactions (e.g. anaphylaxis, angioedema, laryngospasm, bronchospasm or urticaria) is an important part of antenatal assessment.

TIMING OF PROPHYLACTIC ANTIBIOTICS FOR GBS IN ACTIVE LABOUR

Intrapartum antibiotic prophylaxis (IAP) is recommended for all women with GBS risk factors **in active labour, or at the commencement of intervention e.g. induction of labour**, whether or not they have ruptured membranes.

The evidence suggests that IV antibiotics may still be effective if there is likely to be **at least one hour** before the birth.[8-10]

It is recommended that intravenous antibiotics be continued until the baby is born.

PRE-LABOUR CAESAREAN SECTION

Women with risk factors for GBS, other than those with signs of infection, and who have intact membranes and require **pre-labour** elective or emergency caesarean section **do not require** prophylaxis for early onset GBS infection.[11]

PRE-TERM LABOUR

As preterm babies are at increased risk of group B streptoccocal sepsis, prophylactic antibiotics for GBS are recommended for all women who are in established progressive preterm labour, with or without ruptured membranes.

If preterm labour is established, continue antibiotics.

If preterm labour does not establish and membranes are intact, discontinue antibiotics.

If preterm labour is not established but there are prolonged premature ruptured membranes, consider antibiotics for this indication (latency).

PRE-LABOUR RUPTURE OF MEMBRANES (ROM) AT TERM - with no GBS risk factors

A comprehensive assessment of all women with pre-labour ROM at term, to check maternal and fetal wellbeing is recommended.

Women with signs of infection or chorioamnionitis should have immediate treatment with broad spectrum antibiotics and appropriate intervention.

Women who are well, and the fetus is healthy, with pre labour ruptured membranes and no risk factors for GBS **require no intervention**. It is recommended that they wait to go into spontaneous labour (unless they develop signs of infection before then).

- Women who go into spontaneous labour and give birth before 18 hours has elapsed since ROM **do not require** prophylactic antibiotics.

- Women who go into spontaneous labour but do not give birth within 18 hours of rupturing their membranes have developed a risk factor for early onset GBS infection and **prophylactic antibiotics are recommended.**

- Women who do not go into spontaneous labour within 18 hours of rupturing their membranes have developed a risk factor for early onset GBS infection[4] and **require the offer of an induction of labour and prophylactic antibiotics** once labour is established**.**

- Women with signs of infection in association with pre-labour rupture of membranes at term require careful assessment and the **immediate consideration of intravenous broad spectrum antibiotic therapy**. If vaginal birth is appropriate it is recommended that they are offered an induction of labour as soon as possible.

PRE-LABOUR RUPTURE OF MEMBRANES AT TERM - with GBS RISK FACTORS

Women **with risk factors** (see previous section for these) for early onset GBS infection, who are well and have pre-labour rupture of membranes (ROM) at term, are at higher risk of having a baby affected by early onset neonatal GBS infection and it is recommended that they are offered an induction of labour as soon as practicable, with intrapartum antibiotic prophylaxis **at commencement of the induction**.

Any risk factor triggers intrapartum antibiotics as previously discussed.

MATERNAL FEVER AND SUSPECTED CHORIOAMNIONITIS

Maternal fever is a special risk category which requires consideration of broad spectrum antibiotic therapy and additional monitoring, including fetal monitoring. Ruptured membranes are not necessary for the diagnosis of chorioamnionitis. Women with a fever or signs of chorioamnionitis require immediate treatment and intervention.

Clinical signs of chorioamnionitis include maternal fever ($\geq 38^{o}C$) with ≥ 2 of the following:

- abdominal tenderness
- fetal tachycardia.
- maternal tachycardia
- vaginal discharge
- offensive liquor

Where there are clinical signs of infection, appropriate specimens including blood cultures are required before commencing antibiotic treatment.

Recommended antibiotic regimes for IAP

1. Maternal GBS risk factors with no clinical signs of infection - standard IAP#

   Intravenous benzyl penicillin.
   Initial dose **1.2g** and then **0.6g, 4 hrly** until birth**.**.

   (If iv benzyl penicillin is unavailable, Amoxyl is an acceptable alternative. **2g** initially and then **1g, 4 hrly** until birth)

   Allergy to penicillin – YES (Low risk of anaphylaxis - *Women who **do not** have history of anaphylaxis, angioedema, respiratory distress or urticaria after penicillin or a cephalosporin*)

   Cephazolin 2g iv initially, then 1g 8 hrly until birth

   Allergy to penicillin – YES (*High risk of anaphylaxis women who have a history of anaphylaxis, angioedema, respiratory distress or urticaria after penicillin or a cephalosporin*)

Vancomycin 1g iv and repeat 12 hrly until birth.

(Erythromycin and Clindamycin not recommended because of increasing resistance patterns)

2. Maternal GBS risk factors with clinical signs of (chorio)amnionitis (including fever ≥38°C and ≥2 of maternal tachycardia, uterine tenderness, purulent discharge/liquor or fetal tachycardia)

   Broad spectrum antibiotic treatment

   Amoxyl **2g** initially and then **1g, 4 hrly** until birth

   +Gentamicin 4-6 mg/kg iv daily
   (*regimes for gentamicin vary and local protocols should be followed*)

   +Metronidazole 500 mg iv 12 hrly

#When the risk factor is established labour <37 weeks, some DHB's will use more broad spectrum antibiotics

Newborn babies guidelines

- All newborn babies should be observed as outlined in the Ministry of Health Guideline *Observation of mother and baby in the immediate postnatal period: consensus statements guiding practice*. (NZ MOH, 2012. www.health.govt.**nz**/.../**observation**-mother-baby-immediate-postnatal-period)

- Newborns of mothers who have risk factors, regardless of whether the mother has received IAP, also require close observation for signs of sepsis, particularly during the first 24 hours. Women and their family need to understand this so they also know what signs to look for in their baby.

- Signs of sepsis in the newborn may be non-specific and include respiratory distress, apnoea, temperature instability, tachycardia, lethargy, poor feeding, shock or "unwell".

- If the baby is showing signs of sepsis immediate evaluation is required (at least a full blood count and blood cultures) and they should receive empiric therapy for at least 48 hours whilst culture results are awaited. The antibiotics are usually a penicillin and an aminoglycoside as this combination is active against common neonatal pathogens, including GBS and *E. coli*.

- When feasible a lumbar puncture should be performed on all septic newborn babies and especially when blood cultures are positive or when, because of clinical instability or other evidence of sepsis, therapy is continued beyond 48 hours since 10-15% of neonates with meningitis will have sterile blood cultures.

- Maternal chorioamnionitis is associated with an increased risk of invasive disease, even if intrapartum antibiotics have been given. Some authorities recommend that all babies of women with chorioamnionitis should receive immediate evaluation and empiric antibiotic therapy. However, as the risk of an asymptomatic baby having sepsis is still very low no additional recommendation has been made.

Management of asymptomatic newborns when a woman is identified as needing GBS prophylaxis in labour

- If mother **has received appropriate** intrapartum GBS prophylaxis (≥ 4 hours of appropriate antibiotic before delivery) the infant should be observed for at least 48 hours. This does not require admission to a neonatal unit. Some infants may be able to be considered for discharge at 24 hours after delivery with good parental understanding of the situation.

- If mother **did not receive** GBS prophylaxis at all or did not receive it for at least 4 hours prior to birth:

  - If 37 weeks gestation or more, ideally the baby needs close observation (TPR) for 24 hours in a maternity facility.

  -If < 37weeks then a full blood count, blood cultures and CRP is recommended and the baby needs close observation (TPR) for 48hours in a maternity facility. Antibiotics are not required unless other risk factors are present or as guided by the laboratory results.

  -If signs and symptoms of sepsis develop a full diagnostic evaluation is required with initiation of appropriate antibiotics- usually amoxycillin or penicillin and gentamicin ± cefotaxime (if meningitis suspected).[12]

References

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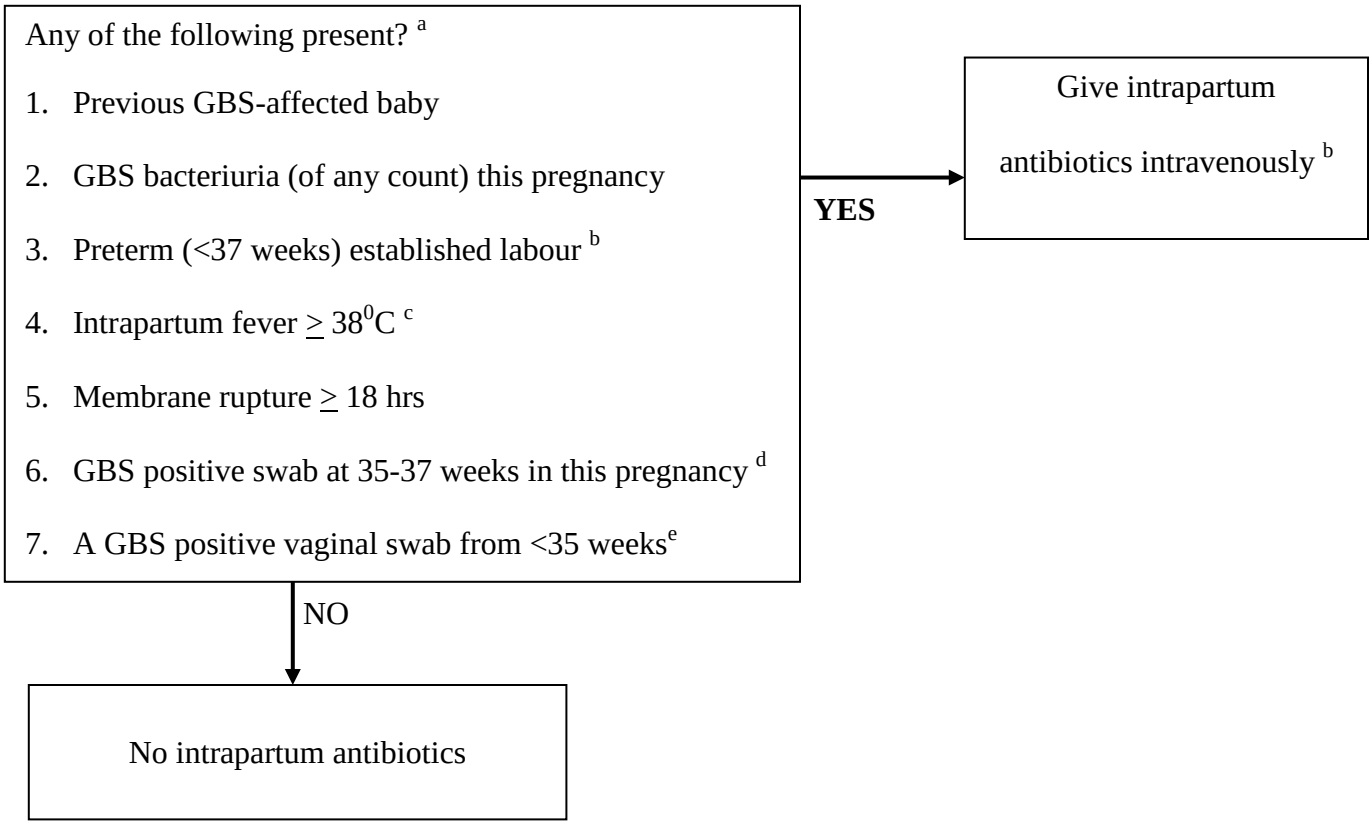
Figure 1. **Risk-based Group B Streptococcus (GBS) strategy**



a Except in women with intact membranes undergoing pre-labour elective caesarean section and have no fever.

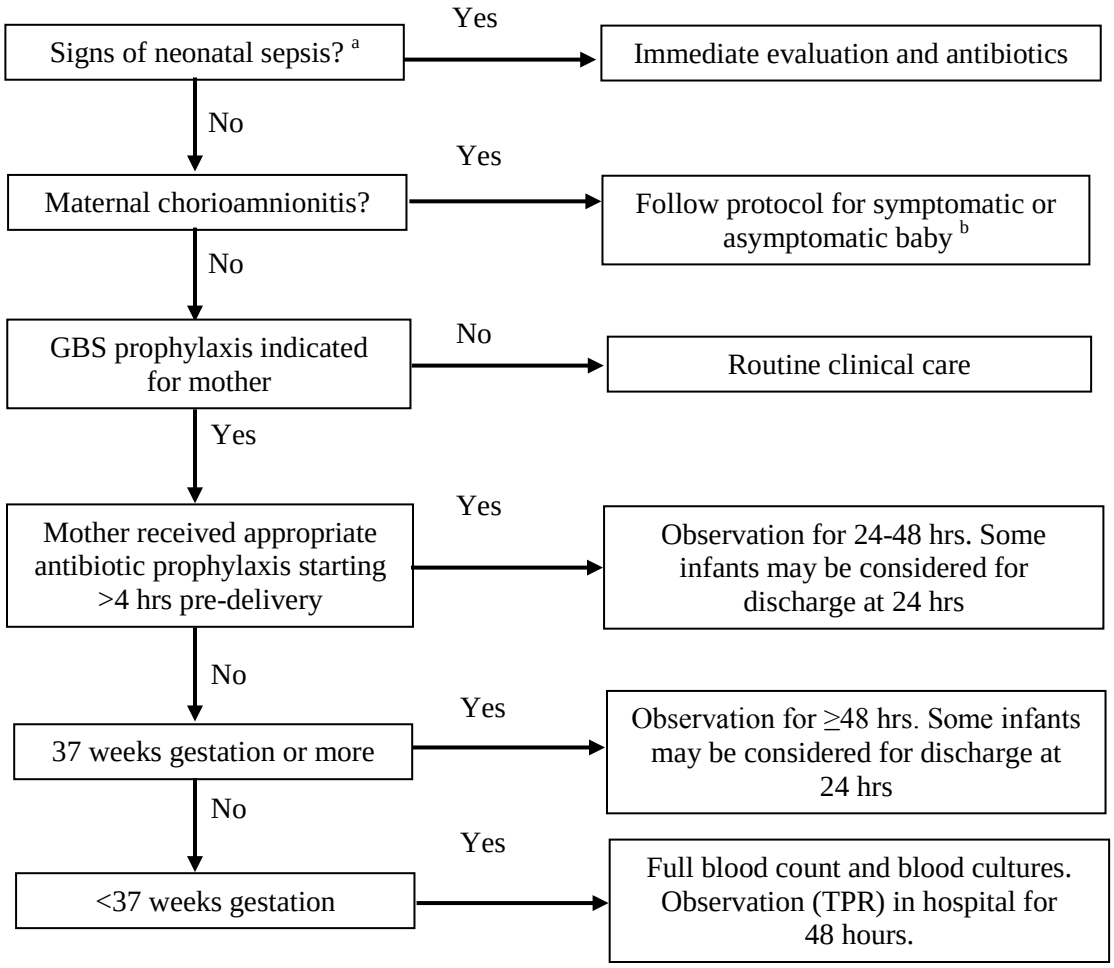
b Some DHB's use more broad spectrum antibiotic regimens for preterm births.

c If chorioamnionitis is suspected, GBS chemoprophylaxis is insufficient and aggressive treatment with broad-spectrum antibiotics is required.

d A GBS screen includes a low vaginal and rectal swab and must state "GBS screen" so that the laboratory use the appropriate culture technique. If a correctly taken swab at 35-37 weeks is negative in a woman who then goes on to have preterm labour or ruptured membranes >18 hours, intrapartum antibiotics are not indicated.

eWhen there is an incidental finding of GBS on a vaginal swab from early in pregnancy the recommendation is that the swab is repeated at 35-37 weeks as above. If that has not been done at the time of labour, the woman should be considered to have a risk factor for EOGBS and IAP should be offered.

Figure 2. **Management of newborn babies**



[a] Signs of sepsis are often non-specific and can include tachypnoea, apnoea, fever or temperature instability, lethargy, or "unwell".

[b] Some authorities recommend that all babies of women with chorioamnionitis should receive immediate evaluation and empiric antibiotic therapy. However, as the risk of an asymptomatic baby having sepsis is still very low no additional recommendation has been made