Nottingham University Hospitals NHS Trust
Nottingham Primary Care Trusts

MATERNITY CLINICAL GUIDELINES

Guideline for the Prevention of Neonatal Group B Streptococcal infection

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This guideline has been registered with the Trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert. Caution is advised when using the guidelines after the review date.

Introduction

Group B streptococcus (GBS) is a recognised cause of bacterial infection in neonates up to three months of age. Although GBS can cause early or late neonatal disease, 80% of disease is of early onset, occurring within 48 hours of delivery. The incidence of early onset disease is reported to be 0.5 per 1000 live births. Approximately 25% of women have vaginal colonisation (Heath et al 2004). Thus only 1 in 500 babies born to GBS carrying mothers will go on to become infected. However, the mortality rate for babies with GBS disease is approximately 10%.

GBS is a normal commensal found in the rectum and vagina, and cannot be eradicated. The vagina may be intermittently colonised, a high vaginal colonisation rate sometimes being reflected in a urine sample growing GBS.

Currently routine antenatal screening is not recommended for GBS carriage. Thus these guidelines are based on a risk factor approach in line with current RCOG guidelines (RCOG 2003)

Recognised risk factors for neonatal infection

Group 1

- Previous infant with GBS disease
- Mother has had GBS in **urine** or found incidentally on **vaginal** swab in the current pregnancy
- Positive GBS result in previous pregnancy (see section on management for details)

Group 2

Clinical risk factors but **no proven evidence** of colonisation with GBS:

- Preterm labour (< 37 weeks)
- Preterm pre-labour rupture of membranes (PPROM)
- Prolonged rupture of membranes (>18 hours) at term
- Pyrexia in labour ($\geq 38^{O}C$)

Actions on positive swab result for GBS

1. The midwife in receipt of the result should check the computer records to establish whether the woman has already delivered and if so, baby's condition and whether on neonatal unit (NNU), ward or at home. If baby in hospital, notify appropriate ward area where a ward midwife should inform NNU and discuss result with the mother. If at home, send standard letter and GBS leaflet to mother, with copies to go to the GP and into the hospital notes. The hospital midwife should inform the community midwife verbally.
2. If antenatal, the midwife should check the alert page for previous knowledge of GBS carriage. If GBS carriage not previously identified, record result on alert page, complete triplicate proforma (copy to woman, GP and notes). Send GBS leaflet with letter to woman. Place yellow GBS alert sticker into handheld notes (if possible) and hospital record.
3. If the community midwife or GP receive the result (they will have taken the swab), they should ring the labour ward receptionist who should trigger the actions identified above.

Antibiotic regimen in labour

Where antibiotic prophylaxis is offered and accepted, this should be commenced **as soon as labour is diagnosed** (antibiotics should be given **at least** 2 hours prior to delivery for maximum benefit).

Dose: **Penicillin G** 3g iv initially then 1.2g iv four hourly until delivery
Or for penicillin allergic women **Clindamycin** 900mg (by intravenous infusion) 8hourly until delivery
NB This dosing has been agreed with the Microbiologists; it is acknowledged that this is at slight variance with the RCOG recommendations

Management: Group 1

- Previous infant with GBS disease

Intrapartum antibiotic prophylaxis is advised. The risk of GBS disease is difficult to quantify but a higher risk may relate to low levels of anti-GBS antibodies (RCOG 2003). Swabs are unnecessary.

- Positive urine culture

Women with GBS on urine culture should be treated for the urinary infection. This also implies a heavy vaginal colonisation. These women should be offered intrapartum antibiotic prophylaxis (RCOG 2003).

- GBS detected on swab in current pregnancy

Treatment antenatally is ineffective and unnecessary. However, consideration should be given to the antenatal treatment of symptomatic patients (e.g. with offensive vaginal discharge) with proven GBS carriage. Intrapartum antibiotic prophylaxis should be offered (Smaill 2002). The risk of neonatal disease in these women is approximately 1 in 500. As antibiotic therapy is associated with rare but significant complications the risks of GBS infection in the baby must be balanced against the wishes of the mother and the risk of adverse reactions. If antibiotics are not administered at least 2 hours prior to birth, the neonatologist will recommend the baby receive intravenous antibiotics pending the result of blood cultures.

- Positive GBS result in previous pregnancy

The RCOG guidance states that there is no evidence that GBS carriage, identified in a previous pregnancy and without complications, warrants screening in the current pregnancy, and does not support intrapartum antibiotic prophylaxis. **We do not conform to this view** given the lack of evidence, no routine screening, and concern that GBS carriage cannot be eradicated. Thus until further evidence is available **we propose these women are offered intrapartum antibiotic prophylaxis.**

Group 1: Term prelabour rupture of membranes (>37 weeks gestation)
In women known to be carriers of GBS with term ROM start iv antibiotics immediately and counsel that augmentation should not be delayed (recent trials suggest that immediate augmentation is not associated with worse maternal outcomes (NICE 2001)).

Group 1: Preterm prelabour rupture of membranes (<37 weeks gestation)
In the case of PPROM, the management should be discussed with a Consultant Obstetrician. In the absence of signs of infection GBS carriage would not usually change the management outlined in the guideline for preterm labour and PPROM. Where intervention is considered appropriate, intrapartum antibiotic prophylaxis should be given. Where conservative management is considered appropriate, these women should receive:

- Oral erythromycin 250mg qds for 10 days or until labour / delivery if sooner (Kenyon 2001; Kenyon [Cochrane] 2003)
- Betamethasone 12mg x2 doses 24 hours apart, if less than 34 weeks gestation
- Intrapartum antibiotic prophylaxis with iv **Penicillin** (or **Clindamycin** if allergic).
- If chorioamnionitis is suspected, change to antibiotics with a broader spectrum including GBS (see 'Chorioamnionitis'). Chorioamnionitis is an indication to augment labour / deliver.

For women in group 1 the Neonatal guideline advises that where intrapartum antibiotics are administered at least two hours prior to birth, neonatal observations for at least 12 hours should be undertaken. Where this is not achieved the guideline advises blood cultures and intravenous antibiotics.

Group 1: Women undergoing emergency or elective caesarean section
These women should receive the standard prophylactic antibiotic regimen for Caesarean section i.e.

Co-amoxiclav 1.2g iv stat after clamping of cord
Or if penicillin allergic women (non-life-threatening) **Cefuroxime** 1.5g iv plus **Metronidazole** 500mg iv stat
Or if significant history of Penicillin / Cephalosporin allergy, Clindamycin 600mg (by intravenous infusion) plus **Gentamicin** 120mg (by intravenous infusion) stat

Women known to be carriers of GBS and planned for LSCS but whose membranes rupture should receive antibiotics as detailed in the treatment in labour section as soon as the ROM is confirmed, and **in addition** should receive antibiotics as detailed above at the Caesarean delivery.

The Neonatal guideline recommends routine care for infants born by elective Caesarean section without prior rupture of membranes

Group 1: Induction of labour
Women known to be carriers for GBS should be offered iv antibiotics as for treatment in labour. These should be commenced **following onset of contractions, SROM or at the time of artificial rupture of the membranes** (ideally at least 2 hours prior to delivery.) In some circumstances it may be appropriate to commence iv antibiotics with the first dose of prostaglandin.

Group 1: Women requesting home birth
These women should be advised to deliver in hospital and receive intravenous antibiotics in labour. Those who choose to deliver at home despite this advice should be given information (found in the GBS leaflet) as to the potential signs of neonatal infection that should prompt access to urgent medical review.

Management: Group 2 (risk factors with no proven evidence of GBS carriage)

Intrapartum risk factors should prompt consideration to administration of antibiotics, especially where more than one risk factor is present. Table 1 can be used to help in the decision making process. Known GBS carriage should be counted as an additional risk factor to those in the table below.

Table 1 (RCOG 2003)

Risk factor	EOGBS cases/ 10 000 untreated women with risk factor	EOGBS deaths/ 10 000 untreated women with risk factor	NNT with IAP to prevent one case of EOGBS	NNT with IAP to prevent one death from EOGBS	EOGBS cases prevented/ year in UK	EOGBS deaths prevented / year in UK
Intrapartum fever (>38°C)	60	6.3	208	1984	52	5.5
Prematurity (< 35 weeks)	35	8.0	357	1562	61	14.0
Prematurity (< 37 weeks)	25	4.6	500	2717	101	18.5
Prolonged rupture of membranes (> 18 hours) at term	21	1.2	595	10416	91	5.2

EOGBS = early-onset group B streptococcus; IAP = intrapartum antibiotic prophylaxis; NNT = number needed to treat

Group 2: Preterm labour (<37+0 weeks gestation)

Data from the ORACLE trial (Kenyon 2001, King [Cochrane] 2002) has provided evidence that antibiotics **should not** be prescribed for women with spontaneous preterm labour without evidence of clinical infection or rupture of membranes. The Neonatologists should be alerted that the infant is premature (most relevant >34 weeks gestation when their attendance at delivery is **not** mandatory).

In the absence of other risk factors, the Neonatal guideline does not advocate routine antibiotic administration to the neonate. However, all babies <34 weeks should be admitted to the NNU where treatment will be at the discretion of the Neonatologist.

Group 2: Preterm prelabour rupture of membranes (<37+0 weeks gestation)

In the case of PPROM, the management should be discussed with a Consultant Obstetrician. The following need to be taken into account (see guideline for management of preterm labour and PPROM):

- Generally conservative management should be adopted before 34 weeks to achieve maturity of the fetus and allow administration of steroids
- Between 34 and 37 weeks the decision is individualised, with a greater leaning to delivery as the gestation and / or period of ROM increases.

- If there is ROM for more than 18 hours at less than 37 weeks gestation, the Neonatal guideline advocates the infant have cultures and antibiotics if intrapartum prophylaxis was not received more than 2 hours prior to delivery. Thus intrapartum antibiotics should generally be given even with early intervention.

Where conservative management is considered appropriate, these women should receive:

- Oral erythromycin 250mg qds for 10 days or until labour / delivery if sooner (Kenyon 2001; Kenyon [Cochrane] 2003)
- Betamethasone 12mg x2 doses 24 hours apart, if less than 34 weeks gestation
- Intrapartum antibiotic prophylaxis with iv **Penicillin** (or **Clindamycin** if allergic). Intrapartum antibiotic prophylaxis as for PPROM with GBS carriage is advised because of the combination of risk factors for GBS disease (prematurity and prolonged ROM).
- If chorioamnionitis is suspected, change to antibiotics with a broader spectrum including GBS (see 'Chorioamnionitis'). Chorioamnionitis is an indication to augment labour / deliver.

The Neonatal guideline advises neonatal observations for at least 12 hours, as long as the first dose of intrapartum antibiotics was administered at least 2 hours before delivery. If ROM more than 18 hours and intrapartum antibiotics not administered more than 2 hours before delivery the infant should have cultures and antibiotics.

Group 2: Prolonged ROM at term (>18 hours)

There is currently insufficient evidence for the use of prelabour prophylactic antibiotics for Term PROM (Flenady [Cochrane] 2002). Induction of labour is appropriate approximately 24 hours after ROM. In the absence of signs of infection, intrapartum antibiotics should not be administered to the mother or baby, even if the membranes have been ruptured for over 24 hours (NICE guideline for Intrapartum care). Intrapartum antibiotics for GBS prophylaxis should be considered where a combination of risk factors for GBS disease exists. The choice of antibiotic should then be Penicillin (or Clindamycin if allergic). Antibiotics with a broader spectrum should definitely be given if there is a concern about chorioamnionitis

The Neonatal guideline advises neonatal observations for at least 12 hours, irrespective of how far the ROM exceeds 18 hours and whether intrapartum antibiotics were administered, so long as the neonate is asymptomatic with no other risk factors.

Chorioamnionitis

Clinical features suggesting this are:

- maternal pyrexia in labour of > 38°C
- uterine tenderness
- maternal tachycardia (>100 bpm)
- fetal tachycardia (>160 bpm)

If chorioamnionitis is suspected, it is important to undertake the following

- Augmentation if not in established labour.
- Hydration of mother.
- Full blood count (FBC), Mid stream urine (MSU), low vaginal swab (LVS) and blood cultures
- Regular Paracetemol (consider iv preparation) if pyrexial

- Intravenous antibiotics (see below)
- Continuous electronic fetal monitoring if appropriate gestation.

The antibiotics used are broader spectrum but still cover GBS. The antibiotic regimen should be:

> **Amoxycillin** 2g iv initially then 1g eight hourly plus **Metronidazole** 500mg iv eight hourly or 1g pr 12 hourly
> **Or** for penicillin allergic women **Clindamycin** 900mg (by intravenous infusion) 8hourly until delivery.

If there is no evidence of response to these antibiotics, discussion with a Medical Microbiologist should take place and the Consultant Obstetrician should be kept informed. Intravenous antibiotics should be continued postpartum until review by a Consultant.

The Neonatal guideline recommends cultures and antibiotics are given if chorioamnionitis is suspected, even if intrapartum antibiotics received.

Women requesting early discharge from hospital when neonatal observations are recommended

Some women would prefer to leave hospital as early as possible if their baby appears well at birth and the only indication for staying is for neonatal observation. If this is the case the midwife should discuss the reasons for the observations being undertaken, and what signs should prompt urgent medical review (GBS leaflet). Urgent review should be sought at the nearest Accident and Emergency Department. Written information should be provided and arrangements made for review by the community midwife the following day.

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Useful Resource: National Library for Health: Group B Streptococcus Online Learning Package: www.whsl.org.uk/gbs

SUMMARY OF GUIDELINE FOR PREVENTION OF NEONATAL GROUP B STREPTOCOCCUS (GBS): Maternal interventions

	Term labour	**Preterm (< 37 weeks) labour**	**Term Pre-labour ROM**	**Preterm Pre-labour ROM**	**El LSCS**	**Intrapartum pyrexia >38^{0}C**	**Suspected chorioamnionitis**
GBS carriage or previous GBS disease	IP Ab prophylaxis	IP Ab prophylaxis	Immediate IOL plus IP Ab prophylaxis	Consultant decision re conservative Mx or intervention. If conservative, erythromycin, steroids (under 34/40) and IP Ab prophylaxis. If intervention, for IP Ab prophylaxis	Standard Ab regimen for LSCS	IP Ab prophylaxis (change to broader spectrum if concern re chorioamnionitis)	Broad spectrum Abs incorporating GBS cover
No GBS carriage / status unknown	No Ab unless pyrexia >38^{0}C	No Ab unless other risk factor eg ROM exceeds 18hours or pyrexia >38^{0}C	Offer IOL after 24hrs. No need for IP Ab prophylaxis unless other risk factor	Consultant decision re conservative Mx or intervention. If conservative, erythromycin, steroids (under 34/40) and IP Ab prophylaxis. If intervention, for IP Ab prophylaxis	Standard Ab regimen for LSCS	IP Ab prophylaxis (change to broader spectrum if concern re chorioamnionitis)	Broad spectrum Abs incorporating GBS cover

IP Ab	Intrapartum antibiotic
ROM	Rupture of membranes
IOL	Induction of labour
Chorioamnionitis	Clinically suspect if pyrexia >38^{0}C, maternal and fetal tachycardia, and uterine tenderness. Not all of these may be present at the same time.

SUMMARY OF GUIDELINE FOR PREVENTION OF NEONATAL GROUP B STREPTOCOCCUS (GBS): Neonatal interventions

		Term labour	Preterm (< 37 weeks) labour *	Term Pre-labour ROM	Preterm Pre-labour ROM	EI LSCS	Intrapartum pyrexia >38^{0}C	Suspected chorioamnionitis
GBS carriage or previous GBS disease	**IP Ab given >2hrs before birth**	Asymptomatic PNW, ≥ 12hrs obs (5.3a)	Asymptomatic TC, ≥ 12hrs obs (5.3a)	Asymptomatic PNW, ≥ 12hrs obs (5.3a)	34-37 weeks, asymptomatic, TC, ≥ 12hrs obs (5.3a)	PNW, normal care	Asymptomatic PNW, ≥ 12hrs obs (5.3a)	Asymptomatic PNW, Ab for ≥ 48hrs (5.5)
	IP Ab NOT given >2hrs before birth	Asymptomatic PNW, Ab for ≥ 48hrs (5.3c)	Asymptomatic TC, Ab for ≥ 48hrs (5.3c)	Asymptomatic PNW, Ab for ≥ 48hrs (5.3c)	Asymptomatic TC, Ab for ≥ 48hrs (5.3d)	PNW, normal care	Asymptomatic PNW, Ab for ≥ 48hrs (5.3c)	Asymptomatic PNW, Ab for ≥ 48hrs (5.5)
	Symptoms / signs of infection	Admit NNU, full septic screen, Abs						
No GBS carriage / status unknown	**Symptoms / signs of infection**	Admit NNU, full septic screen, Abs						
	Asymptomatic	No indication for Abs. PNW, normal care	34-37 weeks. TC. No indication for Abs unless ROM exceeded 18hrs and no IP Abs given (5.3a & d)	Asymptomatic PNW, ≥ 12hrs obs (5.3d term)	34-37 weeks. If IP Abs given, TC, ≥ 12hrs obs (5.3a) If no IP Abs, Ab for ≥ 48hrs (5.3d)	PNW, normal care	If IP Abs given, PNW, ≥ 12hrs obs (5.3a) If IP Abs not given, PNW, Ab for ≥ 48hrs (5.3c)	PNW, Ab for ≥ 48hrs (5.5)

* All babies ≥ 34 weeks are managed as well admitted to