Antenatal screening and intrapartum management of Group B Streptococcus in the UK

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Objective To determine whether there has been any change in UK policy for the screening and intrapartum management of Group B Streptococcus in pregnancy over a two year period.


Setting All obstetric units in the UK.

Population Clinical directors of maternity services.

Methods A questionnaire was sent to all clinical directors of maternity services in the UK requesting information about their policy and practice with respect to antenatal screening for Group B Streptococcus colonisation. Reminders were sent after one month.

Main outcome measures Number of maternity units in the UK screening and offering intrapartum antibiotic prophylaxis for Group B Streptococcus colonisation in pregnancy.

Results The response rates were 84% in 1999 and 82% in 2001. Of the responding units, six (3%) in 1999 and four (2%) in 2001 used vaginal swab based screening for Group B Streptococcus colonisation in the antenatal period. In 1999, intrapartum antibiotic prophylaxis was offered to women with a previous baby affected by Group B Streptococcus in 85% (176/207) of maternity units and in 2001 this had risen to 95% (193/203). Similarly, in 1999 intrapartum antibiotic prophylaxis was offered to women who were known carriers of Group B Streptococcus in 87% (179/207) of maternity units and in 2001 this had risen to 95% (193/203). Appropriate dosage of a recommended antibiotic was prescribed in 7% (9/123) units in 1999 and in 20% (35/178) units in 2001.

Conclusions Although intrapartum antibiotic prophylaxis for women at high risk of giving birth to babies with Group B Streptococcus is widely practiced in the UK, a programme of antenatal screening for Group B Streptococcus colonisation has not been adopted along the lines advocated in the USA. There therefore remains an opportunity to evaluate such a screening programme in a randomised trial.

INTRODUCTION

Group B Streptococcus or Streptococcus agalactiae has emerged as the leading cause of early onset neonatal sepsis with transmission to the neonate occurring during childbirth. This rare but devastating disease can result in neonatal death and severe morbidity such as septicemia, pneumonia and meningitis. There is evidence that many cases of early onset Group B Streptococcus disease are preventable and guidelines for screening and treating women at risk of transmitting Group B Streptococcus have been widely adopted in the USA and Australia but are as yet uncommon in Europe.

In the USA, widespread pregnancy screening and treatment of Group B Streptococcus in labour was advocated by the American College of Obstetricians and Gynecologists in 1996.1 This was backed by the Centres for Disease Control and Prevention in the same year.2 They advocated that one of two valid policies be adopted by obstetricians. The first strategy is based on late (35–37 weeks) antenatal vaginal and rectal microbiological culture as the primary risk determinant (swab-based screening) and the second strategy is based on clinical risk factors (risk-based screening) when the woman is admitted in labour. For women considered to be at risk of transmitting Group B Streptococcus to their neonate, from either screening approach, intrapartum intravenous antibiotic prophylaxis is advocated. They recommended either benzyl penicillin 3 g as a loading dose and 1.5 g four hourly until delivery or clindamycin 900 mg eight hourly for women who are allergic to penicillin.

The example set by the USA, and more recently by Australia, of implementing national screening policies to prevent neonatal Group B Streptococcus disease appears to have been resisted in the UK due to a perceived lack of relevant evidence that such a screening policy would be
justified. The estimated UK incidence of Group B Streptococcus disease under three months of age is 0.7/1000 live births as reported by the British Paediatric Surveillance Unit in 2001 and this is lower than that seen in USA prior to the implementation of screening policies \(^5\) (2.3 cases per 1000 live births).

To determine UK policy for the screening and intrapartum management of Group B Streptococcus colonisation in pregnancy, we undertook two linked national surveys of practice. The first study was undertaken to explore the possibilities of undertaking a randomised controlled trial of antenatal screening for Group B Streptococcus and the second study to clarify whether any changes had occurred over the two year period after a series events had occurred. Namely, publication of the draft guidelines by the Public Health Laboratory Service Group B Streptococcus Working Group, and of the effectiveness of screening in the USA.\(^5\) Anecdotally, we were also aware of the appearance in an increasing number of antenatal clinics across the country of documents produced by the Group B Streptococcus support charity which advocates screening and finally an increasing interest by professionals as demonstrated by a study day at the RCOG on infections in pregnancy (June 2001), which included a substantial component on Group B Streptococcus.

**METHODS**

A questionnaire was sent to the clinical director of each maternity unit in the UK in the autumn of 1999 and again in 2001. Centres were asked to indicate whether they had a formal policy for pregnancy screening and intrapartum management of Group B Streptococcus colonisation. In addition, they were asked to indicate how they would manage a woman with a previous baby affected by Group B Streptococcus disease and a woman who was a known carrier of Group B Streptococcus. To predetermine other clinical risk factors, clinicians were then asked to indicate in what additional clinical circumstances would they consider screening and/or treatment for Group B Streptococcus colonisation appropriate. Finally, they were asked to describe what antibiotic regimens they would use for intrapartum antibiotic prophylaxis in these women. Reminders were sent after a month and if no response was obtained this was followed up by a phone call. Data from the questionnaires were entered into a specifically designed database and analysed.

**RESULTS**

Of the 247 eligible units (with Consultant Obstetric contribution to care) in 1999, a response was obtained from 207 of these (84%). The first database was obtained from the National Perinatal Epidemiology Unit, Oxford, UK and extensively checked and compared with that of Dr Foster's.\(^6\) In 2001, 203 of the 249 maternity units which had obstetric and paediatric medical cover returned the questionnaire (82%). The number of maternity units which returned the questionnaire in both 1999 and 2001 was 141.

In 1999, of the 207 maternity units, six (3%) routinely used an antenatal vaginal swab-based screening approach for all women. Of these six units, none took swabs from both the lower vagina and rectum and only one centre took these swabs between 35 and 37 weeks as advocated by the American guidelines. In 2001, there had been little change with four (2%) routinely using a swab-based screening approach, although none took swabs as advocated by the American guidelines.\(^2\) Only one obstetric unit reported that it continued the policy of routinely screening women during the antenatal period in both 1999 and 2001.

Table 1 lists the conditions which the units indicated they would consider suitable for swab-based screening, in addition to offering swab-based screening to women who have had a previous baby with Group B Streptococcus disease or who were known carriers of Group B Streptococcus. Table 2 details the conditions for which a swab-based screening approach was adopted and whether intrapartum antibiotic prophylaxis was offered to women.

In 1999, intrapartum antibiotic prophylaxis was offered to women whether or not they were screened, with a previous baby affected by Group B Streptococcus in 85% (176/207) of maternity units and in 2001 this had risen to 95% (193/203). Similarly in 1999, intrapartum antibiotic prophylaxis was offered to women who were known carriers of Group B Streptococcus in 87% (179/207) of maternity units and in 2001 this had risen to 95% (193/203).

In 1999, the majority of units would offer swab-based screening and then intrapartum antibiotic prophylaxis to women who had a previous baby affected by Group B Streptococcus disease [198/207 (96%)]; in 2001 this management was used in 177/203 (87%) units. In 1999, intrapartum antibiotic prophylaxis would be offered to women who were known carriers of Group B Streptococcus in 95% (197/207) of units compared with 79% (160/203) in 2001.

Table 1. List of conditions for which clinicians would consider vaginal swab screening for Group B Streptococcus appropriate. Values are expressed as n (%).

<table>
<thead>
<tr>
<th>Condition</th>
<th>1999 (n = 207)</th>
<th>2001 (n = 203)</th>
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<tbody>
<tr>
<td>Preterm labour</td>
<td>96 (46)</td>
<td>106 (52)</td>
</tr>
<tr>
<td>Preterm prelabour rupture of the membranes</td>
<td>74 (36)</td>
<td>73 (36)</td>
</tr>
<tr>
<td>Term prelabour rupture of the membranes</td>
<td>40 (19)</td>
<td>53 (26)</td>
</tr>
<tr>
<td>Prolonged rupture of the membranes</td>
<td>18 (9)</td>
<td>25 (12)</td>
</tr>
<tr>
<td>History of preterm delivery</td>
<td>18 (9)</td>
<td>12 (6)</td>
</tr>
<tr>
<td>History of preterm prelabour rupture</td>
<td>3 (1.5)</td>
<td>1 (0.5)</td>
</tr>
<tr>
<td>of the membranes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antepartum haemorrhage</td>
<td>20 (10)</td>
<td>12 (6)</td>
</tr>
<tr>
<td>Vaginal infection/discharge</td>
<td>27 (13)</td>
<td>44 (22)</td>
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This apparent reduction in the number of maternity units which reported that they were offering women swab-based screening and intrapartum antibiotic prophylaxis could be explained by an increase in which reported that they offered intrapartum antibiotic prophylaxis without swab-based screening. For women with a previous baby affected by Group B Streptococcus disease, intrapartum antibiotic prophylaxis was given in 15% (31/207) of the units in 1999 and had risen to 38% (77/203) in 2001 and for women who were known carriers of Group B Streptococcus in 1999 intrapartum antibiotic prophylaxis was given in 18% (37/207) units and had risen to 45% (91/203) units in 2001.

The number of units which reported swab-based screening for women who had had a previous baby affected by Group B Streptococcus disease and did not offer intrapartum antibiotic prophylaxis if the results are negative had reduced from 49% (101/207) in 1999 to 28% (57/203) in 2001. For women who are known carriers of Group B Streptococcus, the number of units which did not offer intrapartum antibiotic prophylaxis following swabs being negative reduced from 47% (98/207) in 1999 to 24% (49/203) in 2001.

If Group B Streptococcus was detected opportunistically during pregnancy, for example, on a routine midstream urine culture, 157/207 units (76%) would offer intrapartum antibiotic prophylaxis in 1999, and 173/203 (85%) would in 2001.

Other clinical situations which are included in the ‘risk-based’ screening approach such as preterm labour, preterm prelabour rupture of the membranes and prolonged rupture of the membranes were less frequently cited indications for swab-based screening and for intrapartum antibiotic prophylaxis. In addition, even if these conditions were recognised by clinicians, many would not offer intrapartum antibiotic prophylaxis if antenatal swabs were negative for Group B Streptococcus.

Where intrapartum antibiotic prophylaxis is offered, there was wide variation in the antibiotic regimens used. American College of Obstetricians and Gynecologists guidelines...
for the effective prophylaxis in labour recommend Penicillin G 3 mg loading dose, 1.5 mg four hourly, or Amoxicillin 2 g loading dose 1 g four hourly or Clindamycin 900 mg eight hourly given intravenously throughout labour until delivery. In 1999, only 9 of the 123 units used one of these regimens. Of the remaining units, 60 used an appropriate agent but an incorrect dosage, and 33 used an alternative penicillin derivative incorrectly. In 2001, 20% (35/178) of the maternity units were using one of the regimens recommended by the American College of Obstetricians and Gynecologists; of the remaining maternity units, 97 were using an appropriate agent but an incorrect dosage and 41 used an alternative antibiotic incorrectly.

DISCUSSION

There is continuing uncertainty among obstetricians, neonatologists, midwives and consumers about screening programmes to prevent neonatal Group B Streptococcus disease. Any pressure to initiate such programmes appears to have been resisted as in 2001 only four units who replied to the questionnaire, use a vaginal swab-based screening approach and only one used the full clinical risk-based approach as recommended by the American College of Obstetricians and Gynecologists and the Centres for Disease Control and Prevention.

It is possible that asking clinical directors their antenatal clinic and labour ward policy may not provide reliable descriptors of practice. There is an impression that surveys of practice prompt respondents to give answers they think they should, rather than answers which accurately reflect their practice. This seems unlikely in this survey, as there appears to be a widespread lack of uptake of the American College of Obstetricians and Gynecologists and the Centres for Disease Control and Prevention recommendations and even when intrapartum antibiotic prophylaxis was recommended, the drugs chosen and the regimens given were not those recommended.

These results show a clear change for the better in the management of high risk women, namely, those who have had a previous baby with Group B Streptococcus disease or those who are known Group B Streptococcus carriers. However, the number of these women continuing not to receive intrapartum antibiotic prophylaxis if antenatal vaginal swabs are negative illustrates the lack of understanding among clinicians regarding the unreliability of antenatal vaginal swab screening. All women in these circumstances should be treated with intrapartum antibiotic prophylaxis.

Should this poor use of screening and intrapartum antibiotic prophylaxis for Group B Streptococcus colonisation prompt us to improve our practice in this area? If there was clear evidence that screening and intrapartum antibiotic prophylaxis for Group B Streptococcus colonisation resulted in more good than harm, it would be reasonable for a national approach to be taken to standardise practice. In the absence of such information, however, there is likely to be variation in practice until clear evidence can be produced. At the moment such evidence is not reliable as there have been no randomised controlled trials of screening and intrapartum antibiotic prophylaxis for the prevention of Group B Streptococcus disease. A recent article from the USA has suggested that the incidence of early onset neonatal Group B Streptococcus disease has been decreased by the use of intrapartum antibiotic prophylaxis. This was an observational study and not a randomised controlled trial and is therefore susceptible to substantial biases. In addition, the study addressed only Group B Streptococcus related outcomes and did not report the effects such a policy had on neonatal mortality and neonatal sepsis from other causes or on maternal outcomes such as anaphylaxis. What this study did suggest is that the screening policy is likely to reduce the incidence of neonatal Group B Streptococcus disease.

Conversely, however, antenatal screening and intrapartum antibiotic prophylaxis could result in substantial harm. There is evidence that widespread screening and treatment of women may result in an increase in the incidence of late onset neonatal Group B Streptococcus disease and that the incidence of other causes of severe neonatal sepsis (such as Escherichia coli sepsis) may be increased, thereby resulting in no overall reduction in neonatal sepsis. Moore et al. recently acknowledged this concern and that systematic monitoring of early onset sepsis, coupled with targeted research, would inform CDC’s periodic reassessment of prevention strategies in America. A further concern about such widespread use of antibiotics is the effect this management may have on antibiotic resistance patterns in maternity and neonatal units. There have been global calls to limit the use of antibiotics and unless there is clear and unequivocal evidence of benefit from their use, it is likely that antibiotic resistance will continue to be an ever-increasing problem.

Modelling studies based on data from the USA suggest that adoption of a risk-based screening programme will result in 18% of all women receiving intrapartum antibiotic prophylaxis, while adopting a swab-based screening programme would result in 27% of all women receiving intrapartum antibiotic prophylaxis. CDC in America has recently recommended a change in policy on the basis of a re-evaluation of the 1996 guidelines for perinatal Group B Streptococcus prevention. The most substantive change is a recommendation that the USA adopts a policy of universal antenatal screening for Group B Streptococcus colonisation by vaginal and rectal culture at 35–37 weeks of gestation. This change is based on a CDC sponsored study which incorporates population-based surveillance for early onset Group B Streptococcus disease into a sample survey of over 680,000 live births and found that the swab-based screening approach was more than 50% more effective than the risk-based approach at preventing neonatal Group B Streptococcus disease. In the UK, assuming that carriage
of Group B Streptococcus is similar to that in the USA. Such a programme would mean the treatment of approximately 183,600 women per year with intrapartum antibiotic prophylaxis in labour with all the service implications, increased costs and risks this would involve. Other recommendations in this policy document include not giving intrapartum antibiotic prophylaxis for Group B Streptococcus colonised women undergoing planned caesarean deliveries without preceding labour or membrane rupture. Also, surprisingly, that colonisation with Group B Streptococcus in a previous pregnancy is not considered an indication for intrapartum prophylaxis in subsequent pregnancies, rather that such women require repeat evaluation for antenatal colonisation.

It is clear, therefore, that considerable uncertainty exists with respect to whether obstetricians should screen all women for Group B Streptococcus colonisation. There appears to be increasing consensus that women who have had previous babies with Group B Streptococcus disease should be offered intrapartum antibiotic prophylaxis.

The recommendation from the Centres for Disease Control and Prevention that the USA adopts a policy of implementation of a swab-based screening programme makes evaluation all the more important as the costs of setting up such a programme in the UK would be considerable. Such an evaluation could be achieved by a large cluster randomised controlled trial of screening for Group B Streptococcus colonisation in pregnancy based on the swab-based screening approach recommended by the American College of Obstetricians and Gynecologists and the Centres for Disease Control and Prevention.

When respondents to the survey were asked whether they would consider collaborating in a trial to evaluate the use of routine screening of Group B Streptococcus colonisation in pregnancy, 76% said yes in 1999 while 85% said yes in 2001. When asked if they were interested in collaborating if a randomised clinical trial was developed to evaluate the use of routine treatment for Group B Streptococcus carriage in pregnancy in 1999, 73% said yes; in 2001 this has risen to 82%. This suggests that there remains a widespread interest in collaborating with such a trial.

References


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