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# Group B Streptococcus Infection in Neonates

This briefing paper provides an introduction to the subject of Group B streptococcus (GBS) infection in neonates (newborn babies). It includes some key statistics outlining the scope of the issue and an overview of the policy, professional guidance and practice around screening for GBS in the UK and some other countries. The briefing also touches on some of the conflicting research evidence. The need for further research in areas such as surveillance and more rapid GBS test development is also highlighted.

## 1. Introduction to Group B Streptococcus (GBS) and Screening for GBS

Group B streptococcus, also known as Group B strep or GBS, is one of many different bacteria that normally live in our bodies usually without causing any harm.

Approximately one third of people carry GBS in their intestines<sup>1</sup> and additionally, about a quarter of women also carry GBS in their vagina where it does not usually cause any

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<sup>1</sup> [http://www.gbss.org.uk/content.php?section\\_id=3&sub\\_id=8&content=GBS](http://www.gbss.org.uk/content.php?section_id=3&sub_id=8&content=GBS)

problems or symptoms.<sup>2</sup> It is thought that people who carry GBS typically do so temporarily, that is, they do not become lifelong carriers of the bacteria.<sup>3</sup>

However, GBS can occasionally cause infection in neonates (newborn babies) if the GBS bacterium is passed from the mother to the baby during labour. It is also known that in pregnant women GBS can cause bladder and womb infections, preterm delivery, stillbirths and late miscarriages, although these complications are not common.<sup>4</sup> There is some limited research published into a possible connection between GBS carriage and recurring first trimester miscarriage, and possible preventative antibiotic treatment.<sup>5</sup>

GBS is the most common cause of blood infections and meningitis in neonates, particularly in the first week after birth. Among men and among women who are not pregnant, the most common diseases caused by GBS are blood infections, skin or soft tissue infections, and pneumonia.<sup>6</sup> There are two types of GBS in neonates<sup>7</sup>:

- **Early-onset GBS disease** (occurs within first 6 days of life): early-onset GBS infection is caught by the baby from the birth canal during labour<sup>8</sup> and usually presents as septicaemia (blood poisoning) with pneumonia. 75% of GBS disease in newborns is considered early-onset and the great majority of survivors of early-onset disease do so without long-term damage; and
- **Late-onset GBS disease**, (occurs after the baby is 6 days old): late-onset GBS infection usually presents as meningitis with septicaemia and it is probably transmitted when babies are in contact with hands contaminated with GBS.<sup>9</sup> After 3 months of age, a GBS infection in a baby is very rare. Of the survivors of GBS meningitis, up to one half suffer long-term mental and/or physical problems, from mild to severe learning disabilities, loss of sight, loss of hearing and lung damage (in around 12% of the survivors, the disabilities may be severe).

It is generally accepted that the best way of knowing which women carry GBS is through testing at 35-37 weeks of pregnancy using an enriched culture method (ECM) test.<sup>10</sup> If the tests are positive, then preventative measures can be put in place to minimise the risk of transmission to the baby, including delivery of intravenous antibiotics in labour (intrapartum antibiotic prophylaxis or IAP) to women whose babies are at higher risk of developing GBS infection.

<sup>2</sup> Source: <http://www.babycentre.co.uk/pregnancy/antenatalhealth/physicalhealth/groupbstrep/>

<sup>3</sup> Source – Support Group - The Jesse Cause, Saving Babies from Group B Strep, [http://www.thejessecause.org/pages/about\\_gbs.html](http://www.thejessecause.org/pages/about_gbs.html)

<sup>4</sup> [http://www.gbss.org.uk/content.php?sub\\_id=8&section\\_id=3](http://www.gbss.org.uk/content.php?sub_id=8&section_id=3)

<sup>5</sup> Toth, Attila MD, Antibiotic Management of Miscarriages Associated with Group B Streptococcus Genital Tract Infection, Fertility Solution, <http://www.fertilitysolution.com/Latest-Research/Miscarriages-Associated-with-Group-B-Strep.html>

<sup>6</sup> <http://pregnancy.about.com/cs/groupbstrep/l/blgbsfacts.htm>

<sup>7</sup> [http://www.gbss.org.uk/content.php?section\\_id=3&sub\\_id=8&content=GBS](http://www.gbss.org.uk/content.php?section_id=3&sub_id=8&content=GBS)

<sup>8</sup> [www.meningitis.org/disease-info/types-causes/gbs](http://www.meningitis.org/disease-info/types-causes/gbs)

<sup>9</sup> [www.meningitis.org/disease-info/types-causes/gbs](http://www.meningitis.org/disease-info/types-causes/gbs)

<sup>10</sup> [http://www.gbss.org.uk/content.php?sub\\_id=2&section\\_id=3](http://www.gbss.org.uk/content.php?sub_id=2&section_id=3)

Screening to prevent **early-onset** GBS in neonates has been established in the United States for the past decade and results in about 30-50% of women receiving intravenous prophylactic antibiotics during labour. Most Western countries presently offer either universal culture-based screening test to identify pregnant women who carry GBS or else take a risk-based approach to such testing and subsequent treatment. Screening is not currently recommended in the United Kingdom because of a lack of evidence of effectiveness and a risk-based approach to treatment is currently followed.<sup>11</sup>

The option for women in the UK who wish to have the Enriched Culture Medium (ECM) test is to pay a private clinic for the service. The cost is around £30 and there are two private UK clinics that offer it. The test is sent in the post so that the swab can be taken at home and posted back to the laboratory for testing.<sup>12</sup>

In the USA the current policy of the Centres for Disease Control (CDC) is that, in the absence of a vaccine for GBS, universal screening [using the ECM test] and intrapartum antibiotic prophylaxis “*continue to be the cornerstones of early-onset GBS disease prevention*”.<sup>13</sup>

## 2. GBS in Neonates - Key Statistics

Overall in the UK, each year, based on a figure of around 700,000 babies born annually in the UK, it is estimated that:

- 230,000 babies are born to mothers who carry GBS;
- 88,000 babies (1 in 8) become colonised with GBS;
- 700 babies develop GBS infections, usually within 24 hours of birth; and
- 75 babies (11% of infected babies) die.<sup>14</sup>

In Northern Ireland over the past decade the number of live births registered has ranged from 21,400 in 2002 to 25,300 in 2010.<sup>15</sup> Over the period 2003 to 2009 the number of cases of GBS in infants (0-90 days old) (early-onset plus late-onset) reported in Northern Ireland has ranged from 14 in 2005 to a peak of 29 in 2003. In 2009 the figure was 24 cases of which 11 were early-onset (0-6 days) and 13 were late-onset (7-90 days).<sup>16</sup>

<sup>11</sup> Colbourn, T et al. (2007), Preventive strategies for group B streptococcal and other bacterial infections in early infancy: cost effectiveness and value of information analyses, *British Medical Journal*, 11 September 2007

<sup>12</sup> [www.madeformums.com/pregnancy-health-and.../4826.html](http://www.madeformums.com/pregnancy-health-and.../4826.html)

<sup>13</sup> Verani JR, et. al. (2010), Division of Bacterial Diseases, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention (CDC)., [Prevention of perinatal group B streptococcal disease--revised guidelines from CDC, 2010](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm59rr10a1.htm). MMWR Recomm Rep. 2010 Nov 19, 59(RR-10):1-36.

<sup>14</sup> Data from Group B Strep. Support Group: [http://www.gbss.org.uk/content.php?section\\_id=3&sub\\_id=8&content=GBS](http://www.gbss.org.uk/content.php?section_id=3&sub_id=8&content=GBS)

<sup>15</sup> NISRA Statistical Bulletin, March 2011,

[http://www.nisra.gov.uk/archive/demography/publications/births\\_deaths/births\\_2010.pdf](http://www.nisra.gov.uk/archive/demography/publications/births_deaths/births_2010.pdf)

<sup>16</sup> Source: Health Protection Agency (2003-10). Infection Reports - Pyogenic and Non-Pyogenic streptococcal bacteraemia in England, Wales and Northern Ireland, 2001 - 2009. Health Protection Reports. Available at: [http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1287144931510](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1287144931510)

According to published figures for the period 2001 to 2009, the incidence of GBS in Northern Ireland was consistently higher than in England and Wales for both early-onset and late-onset cases. In 2009, for example, the 'all cases' rate was 0.96 per 1,000 live births in Northern Ireland, compared with 0.64 in England and 0.54 in Wales. Similarly, in 2001 the Northern Ireland GBS rate for all cases was 0.90 per 1,000 live births, compared with 0.75 and 0.59 in England and Wales respectively<sup>17</sup>.

Over the period 2001 to 2010 there were **11 officially recorded infant deaths** in Northern Ireland, where the cause of death was registered as GBS as either the primary cause (5 deaths) or the secondary cause of death (6 deaths).<sup>18</sup> It is possible that there are additional stillbirths caused by GBS.

In connection with this the DHSSPS have advised that at present the nationally agreed coding system used to code the cause of stillbirths and deaths in infants in the first 28 days of life does not allow coding down to the level of individual organisms to which a death is attributed. Therefore it is not possible to identify through the NIMACH (NI Mother and Child Health Database) the number of babies in Northern Ireland who were either stillborn or who died within the first 28 days of life as a direct result of GBS. This perinatal mortality coding system is currently under review.<sup>19</sup>

### 3. Prevention of Early-onset Neonatal Group B Streptococcal Disease.

There appears to be general agreement that Intrapartum Antibiotic Prophylaxis (IAP), (antibiotics given to women during labour) is currently the recommended way to reduce the risk of neonatal GBS transmission and disease. The main controversy that still exists is the way to select women 'at risk' to be given the IAP treatment and there appears to be two main approaches to selecting those women as discussed below.

#### 3.1 UK - Risk-factor based approach

Firstly in the UK, a **risk-factor based** approach is generally used as advocated by the Royal College of Obstetricians and Gynaecologists (RCOG) in its guideline (Guideline No. 36) entitled '*Prevention of Early Onset Neonatal Group B Streptococcal Disease*'.<sup>20</sup> This guidance is in the process of being updated. The RCOG recommend that risk factor based screening with intrapartum antibiotic prophylaxis is offered to all pregnant

<sup>17</sup> 2001 data: Heath PT, Balfour G, Weisner AM, Efstratiou A, Lamagni TL, Tighe H, O'Connell LAF, Cafferkey M, Verlander NQ, Nicoll A, and McCartney, AC (2004). *Group B streptococcal disease in UK and Irish infants less than 90 days of age*. Lancet 2004; vol 363, pp. 292-4. The remaining data (2003 – 2009): HPA website, see footnote 16.

<sup>18</sup> Source: Personal Communication with Chair of NICORE (Neonatal Intensive Care Outcomes Research and Evaluation), original source of information - General Register Office

<sup>19</sup> Personal Communication from the Private Office, DHSSPS, 5<sup>th</sup> Sept. 2011, Ref: COR/1438/2011

<sup>20</sup> Royal College of Obstetricians and Gynaecologists, 'Preventing group B streptococcus (GBS) infection in newborn babies - information for you' <http://www.rcog.org.uk/womens-health/clinical-guidance/preventing-group-b-streptococcus-gbs-infection-newborn-babies#national>

women with recognised risk factors for early-onset GBS disease. These risk factors are:

- Previous baby affected by GBS;
- GBS detected in the vagina or urine during the current pregnancy;
- Preterm labour;
- Prolonged rupture of the membranes; and
- Fever in labour.

The argument for IAP becomes stronger in the presence of two or more risk factors.

In 2007, an audit on the use of the RCOG guidelines in Obstetric Units in England, Scotland, Wales and Northern Ireland was conducted and the protocols from 171 obstetric units were reviewed. Most units that took part (78%) had protocols recommending a risk-based Intrapartum antibiotic prophylaxis (IAP) strategy. The other units (22%) recommended a combination of risk-based IAP and risk-based bacteriological testing, in which women with certain risk factors had a bacteriological test and received IAP if found to be GBS positive.<sup>21</sup>

### 3.2 Prenatal culture-based screening test

The second approach to selecting women requiring the IAP treatment is a **prenatal culture-based screening test** for all pregnant women at 35-37 weeks gestation where a swab (combined low vaginal and anorectal swab) is placed into a selective enrichment broth medium for 24-48 hours. Culture results are less predictive of GBS status at full-term of the pregnancy if the test is performed earlier than 35 weeks.<sup>22</sup> This is known as the ECM test (Enriched Culture Medium) and is recognised as the 'gold standard' for detecting GBS.<sup>23</sup>

This approach is presently widely adopted in many countries, including the USA, Australia, New Zealand, Germany, Italy, Spain and Canada.

The Centers for Disease Control (CDC) in the USA first issued guidelines on use of IAP for prevention of GBS disease in 1996 and those guidelines were revised in 2002 (and then updated in 2010), when it was recommended that all women undergo vaginal-rectal screening for GBS colonisation at 35-37 weeks' gestation to identify which women should receive IAP.<sup>24</sup> The Introduction of screening in the USA has been widely seen as a successful move;

<sup>21</sup> [http://www.rcog.org.uk/files/rcog-corp/uploaded-files/neonatal\\_audit\\_full\\_250507.pdf](http://www.rcog.org.uk/files/rcog-corp/uploaded-files/neonatal_audit_full_250507.pdf)

<sup>22</sup> The Royal Australian and New Zealand College of Obstetricians and Gynaecologists, Screening and Treatment for Group B Streptococcus in Pregnancy, July 2009, <http://www.ranzcog.edu.au/publications/statements/C-obs19.pdf>

<sup>23</sup> Source: Group B Strep Support, [http://gbss.org.uk/content.php?sub\\_id=10&section\\_id=3](http://gbss.org.uk/content.php?sub_id=10&section_id=3)

<sup>24</sup> Updated guidance from the CDC, Centers for Disease Control, Prevention of Perinatal Group B Streptococcal Disease Revised Guidelines from CDC, November 2010 available at [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5910a1.htm?s\\_cid=rr5910a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5910a1.htm?s_cid=rr5910a1_w) .

*“In the USA intrapartum chemoprophylaxis [IAP] has led to a fall in the incidence of early onset group B streptococcal infection from 1.5:1000 (prior to screening in 1993) to 0.3:1000 in 2006.”<sup>25</sup>*

In Australia and New Zealand, the guidance according to the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG), is that screening for GBS carriage should take place;

*“For the screening approach, GBS carriage is best predicted by prenatal screening at 35-37 weeks gestation [combined low vaginal and anorectal swab] placed into a selective enrichment broth medium.”<sup>26</sup>*

In Australia it is believed that, *“intrapartum chemoprophylaxis [IAP] has led to a decline in the incidence of early onset GBS disease in the past decade”<sup>27</sup>* however, it appears that despite the RANZCOG guidance, a recent survey has revealed differences of opinion among practitioners about the necessity of universal screening to select women at risk. Of the 488 obstetricians and 68 neonatologists (in practice at the time of the survey) who responded to the survey, 271 obstetricians (56%) and 40 neonatologists (61%) supported universal antenatal screening. Of those respondents who did not support a universal antenatal screening policy, 196 (93%) and 24 (92%) of the obstetricians and neonatologists respectively, supported antenatal screening based on risk factors (as applied currently in the UK).<sup>28</sup>

Similar Canadian Guidance from the Society of Obstetricians and Gynaecologists of Canada on the *Prevention of Early-Onset Neonatal Group B Streptococcal Disease*, (September 2004) recommends that practitioners;

*“Offer all women screening for group B streptococcus disease at 35 to 37 weeks’ gestation with culture done from one swab first to the vagina then to the rectal area”, with the culture of samples takes place by means of the enrichment broth medium.<sup>29</sup>*

The Canadian guidance also states that studies have shown that universal screening is more effective disease control than a risk-based approach and that the cost savings resulting from a reduction of morbidity and mortality makes screening cost-effective;

*“Mathematical projections show that universal screening would lead to greater disease declines than the risk-based approach, resulting in a 69%*

<sup>25</sup> The Royal Australian and New Zealand College of Obstetricians and Gynaecologists, Screening and Treatment for Group B Streptococcus in Pregnancy, July 2009, <http://www.ranzcog.edu.au/publications/statements/C-obs19.pdf>

<sup>26</sup> The Royal Australian and New Zealand College of Obstetricians and Gynaecologists, Screening and Treatment for Group B Streptococcus in Pregnancy, July 2009, <http://www.ranzcog.edu.au/publications/statements/C-obs19.pdf>

<sup>27</sup> The Royal Australian and New Zealand College of Obstetricians and Gynaecologists, Screening and Treatment for Group B Streptococcus in Pregnancy, July 2009, <http://www.ranzcog.edu.au/publications/statements/C-obs19.pdf>

<sup>28</sup> McLaughlin K. and Crowther C. (2010) [Universal antenatal group B streptococcus screening? The opinions of obstetricians and neonatologists within Australia](#). Aust N Z J Obstet Gynaecol, **50**(5):410-2.

<sup>29</sup> [http://www.sogc.org/health/pregnancy-groupb\\_e.asp#test](http://www.sogc.org/health/pregnancy-groupb_e.asp#test) The Society of Obstetricians and Gynaecologists of Canada

*reduction in disease with 18% treated in a risk-based approach versus an 86% reduction of disease with 27% treated in a culture-based approach.”*

*“It has also been shown that a risk-based versus screening approach is essentially equivalent in cost and in the number of women treated with antibiotics”<sup>30</sup>*

### 3.3 UK Guidance on prenatal culture-based screening test

With regard to the universal screening approach to select pregnant women in need of IAP treatment, the UK National Screening Committee (NSC) (which advises the four UK Health Departments on all aspects of screening policy) presently remains of the view that<sup>31</sup>:

*“Screening for this condition should **not** be offered”.*

This policy was reviewed in November 2008 and it is due to be considered again in 2011/12. One of the main reasons for the NSC view is that it believes that no high quality randomised trials have been done to measure the effect of IAP on the incidence of neonatal sepsis (blood poisoning) as a whole (that is sepsis proven by culture and also presumed sepsis) or on neonatal death. Its view is that therefore it is not currently possible to accurately quantify the effectiveness of IAP at decreasing the incidence of early onset GBS sepsis and that existing evidence probably over-estimates the magnitude of this effectiveness.<sup>32</sup>

This view on not screening for GBS carriage in pregnant women is presently supported in the UK both the National Institute of Clinical Excellence (NICE) and Royal College of Obstetricians and Gynaecologists (RCOG). The RCOG is in the process of reviewing its guidance.

The NICE Clinical Guideline 62<sup>33</sup> (CG 62) (2003) – *Antenatal care, routine care for the healthy pregnant woman* which states that,

*“Pregnant women should not be offered routine antenatal screening for group B streptococcus because evidence of its clinical and cost effectiveness remains uncertain”.*

An update to the guideline was published in 2008; however the position on screening for GBS was unchanged,

<sup>30</sup> Society of Obstetricians and Gynecologists of Canada, Infectious Diseases Committee Clinical Practice Guidance on the Prevention of Early-Onset Neonatal Group B Streptococcal Disease, September 2004, available at <http://www.sogc.org/guidelines/public/149E-CPG-September2004.pdf>

<sup>31</sup> <http://www.screening.nhs.uk/groupbstreptococcus>

<sup>32</sup> Brocklehurst, P. and Kenyon, S (2008), Evaluation of antenatal screening for Group B Streptococcal (GBS) carriage against NSC Handbook Criteria, [www.screening.nhs.uk/policydb\\_download.php?doc=44](http://www.screening.nhs.uk/policydb_download.php?doc=44)

<sup>33</sup> <http://www.nice.org.uk/nicemedia/pdf/CG062NICEguideline.pdf>

*“No trials comparing antenatal screening with no antenatal screening have been conducted, nor have any trials comparing different screening strategies been identified. Therefore, estimates of efficacy of screening strategies are based only on observational studies”.*<sup>34</sup>

The RCOG guidance states that the evidence suggests that screening all pregnant women in the UK for GBS carriage routinely would not be beneficial overall,

*“...there is still no clear evidence to show that screening all pregnant women (for GBS carriage) in the UK would be beneficial overall”.*<sup>35</sup>

The guideline states that tests can be carried out privately for GBS (as mentioned earlier) but does not recommend this because a positive test may possibly result in unnecessary and potentially harmful interventions with possible risks including death or serious injury to a very few women from an allergic reaction (anaphylaxis) to the antibiotics; and strains of bacteria becoming resistant to antibiotics.<sup>36</sup>

Group B Strep Support (GBSS) is a UK Charity that was formed in 1996 which has a keen interest in the policy in this area. GBSS has three main aims, to:

- Offer information and support to families affected by GBS;
- Inform health professionals and individuals how most GBS infections in newborn babies can be prevented; and
- Generate continued support for research into preventing GBS infections in newborn babies.

GBSS believes that every woman should be fully informed about GBS and offered the opportunity to have an ECM test to detect GBS carriage late in pregnancy and the results of these tests can then be used to inform as to what further treatment may be needed.<sup>37</sup> There are three key areas they wish to see addressed, that:

- Every pregnant woman in the UK is given accurate information about GBS as a routine part of her antenatal care;
- A national screening program to be introduced on the NHS, to test all pregnant women for carriage of GBS at 35-37 weeks; and
- Those women found to be carrying GBS, as well as those with risk factors that put their babies at higher risk of developing GBS infection, to be offered intravenous antibiotics in labour.

<sup>34</sup> <http://www.nice.org.uk/nicemedia/live/11947/40145/40145.pdf> p.199

<sup>35</sup> <http://www.rcog.org.uk/womens-health/clinical-guidance/preventing-group-b-streptococcus-gbs-infection-newborn-babies>

<sup>36</sup> <http://www.rcog.org.uk/womens-health/clinical-guidance/preventing-group-b-streptococcus-gbs-infection-newborn-babies>

<sup>37</sup> GBSS, [www.gbss.org.uk/section.php?section\\_id=2&section=Who We Are](http://www.gbss.org.uk/section.php?section_id=2&section=Who%20We%20Are)

### 3.4 Awareness of GBS

At present, raising awareness of GBS to women appears to be mainly done at antenatal clinics through the issue of the NHS Pregnancy Book<sup>38</sup> (there is a Northern Ireland version of this book).<sup>39</sup> The book outlines what GBS is and describes the risk-based approach taken to decide which mothers are deemed 'at risk' and will be offered antibiotics during labour. The book does highlight that it is possible to be tested for GBS late in pregnancy and advises those women with concerns to talk to their doctor or midwife.<sup>40</sup>

In terms of awareness of GBS, an online survey carried out by 'Bounty'<sup>41</sup> with over 2200 women ranging from the early stages of pregnancy through to mums with a youngest child aged 2 years revealed that nearly 3 in 5 of those surveyed were aware of GBS with the majority having first heard about GBS from a non-healthcare professional source – 42% from a pregnancy book or magazine and 21% from a friend or other mother. 20% found out about GBS from a midwife. The majority responded that they should be made more aware of GBS and be offered a test by the NHS or the option to pay for one. 56% stated they would pay to have the private test and a quarter stated they would like to have the test but could not afford to pay for it.<sup>42</sup>

### 3.4 Conflicting Research

It appears that presently the various relevant UK bodies (National Screening Committee, NICE and RCOG) are united in their agreement over the lack of suitable evidence to support a move to universal antenatal screening for GBS carriage and remain focused on a risk-based approach to determining which women require IAP treatment. This is pending the RCOG completing a review of its current guidance and the National Screening Committee reviewing its position in 2011/12.

As stated above for Australia, where universal screening is recommended, there appears to remain differences of clinical opinion over a universal antenatal screening policy versus support for a risk-factor based approach.<sup>43</sup>

Within the UK there is published research that appears to conflict with the current UK approach to not offer universal screening for GBS carriage in pregnancy.

<sup>38</sup> NHS Pregnancy

Book:[http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh\\_117166.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh_117166.pdf)

<sup>39</sup> The Pregnancy Book is produced by the Central Office of Information for the Department of Health. In Northern Ireland, with permission from DH, the Pregnancy Book is edited by the Public Health Agency to customise it for Northern Ireland. New editions are published frequently, with a gap of between 1 and 3 years between editions. The current edition was published in 2010, personal communication from DHSSPS, 7/09/11

<sup>40</sup> [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh\\_117166.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/@sta/@perf/documents/digitalasset/dh_117166.pdf) p.38

<sup>41</sup> Bounty is described on its website as the UK's best loved parenting club. It has been supporting mums for over 50 years, providing information about pregnancy and parenthood. <http://www.bounty.com/>

<sup>42</sup> Source Group B Strep Support (GBSS), personal email communication, 02/08/11

<sup>43</sup> McLaughlin K. and Crowther C. (2010) [Universal antenatal group B streptococcus screening? The opinions of obstetricians and neonatologists within Australia.](#) Aust N Z J Obstet Gynaecol, **50**(5):410-2.

An article published in 2005 in the RCOG journal *The Obstetrician and Gynaecologist* (TOG), entitled 'Group B streptococcal disease: screening and treatment in pregnancy', discussed the risk-based treatment strategy (as presently used in the UK). The article concluded that while this approach has many advocates, 30-40% of babies with early-onset GBS are born to women with no identifiable risk factors, so even rigorous application of the risk-based strategy cannot, therefore, reduce the incidence of early-onset GBS by more than 60-70%.<sup>44</sup>

Collaborative research carried out in the UK to determine the cost effectiveness of strategies for preventing neonatal infection with GBS, and other bacteria, was published in 2007 by researchers from UCL Institute of Child Health, London; the Centre for Health Economics, University of York; School of Economics, University of Nottingham and MRC Health Services Research Collaboration, University of Bristol.<sup>45</sup>

The research concluded that current practice in the UK which is to treat (with IAP) high risk women only, without culture-testing them for GBS carriage, is not cost effective. They recommended that the most cost effective option would be to culture-test low risk term women to determine which of these women required IAP treatment, while treating with IAP all preterm and high risk term women.<sup>46</sup>

## 4. Future Directions

Colburn et al. (2007) summarised the controversy around the potential for the introduction of universal screening for GBS in the UK by posing three questions for policy makers:<sup>47</sup>

*The controversy centres on three factors. Firstly, is the incidence of early onset neonatal infection high enough in the UK for the benefits to outweigh the costs? Secondly, would the benefits of routine testing be worthwhile over and above existing use of prepartum antibiotics as part of good clinical practice (such as for maternal fever or preterm rupture of the membranes before the onset of labour)? Thirdly, would it be better to await the development of a vaccine for group B streptococcal infection in pregnant women? This could be available within the next 5-10 years and would be expected to have an impact on both early and late onset infection in early infancy.*

In October 2008 the National Screening Committee (NSC) published a review against UK NSC criteria entitled 'Evaluation of antenatal screening for Group B Streptococcal

<sup>44</sup> Bassel Abd El Malek, et.al, Group B streptococcal disease: screening and treatment in pregnancy', *The Obstetrician and Gynaecologist* 2005, 7(1) p. 34-39, <http://onlinelibrary.wiley.com/doi/10.1576/toag.7.1.034.27040/pdf>

<sup>45</sup> Colbourn et al, 'Preventive strategies for group B streptococcal and other bacterial infections in early infancy: cost effectiveness and value of information analyses', *British Medical Journal*, September 2007

<sup>46</sup> Colbourn et al, (2007) Preventive strategies for group B streptococcal and other bacterial infections in early infancy: cost effectiveness and value of information analyses, *British Medical Journal*, 335 (7621), 655

<sup>47</sup> Colbourn, T et al. (2007), Preventive strategies for group B streptococcal and other bacterial infections in early infancy: cost effectiveness and value of information analyses, *British Medical Journal*, 11 September 2007.

(GBS) carriage against NSC Handbook Criteria.' One of the areas of conclusion recommended further research in the following areas<sup>48</sup>:

- *“Randomised controlled trials of swab-based screening for GBS carriage. The question of whether swab based screening is clinically and cost-effective remains uncertain and until robust evidence is available there is little to guide clinical practice.*
- *Development and testing appropriate vaccines for use in women [There are currently several potential vaccines in development.<sup>49</sup>] The results of such research are unlikely to impact on clinical practice for many years but this remains an urgent requirement.*
- *Further investigation of rapid tests for GBS for use in labour. As the technology improves this method of identifying carriers in labour may allow more targeted approaches to identify women at higher risk of transmission – i.e. those with clinical risk factors who can then be tested to identify GBS carriage*
- *Surveillance of all-cause neonatal sepsis, including culture-proven and probable sepsis should be initiated and maintained in the UK. The existing system should be extended to ensure that ‘probable sepsis’, precisely defined, is also collected.”*

## 5. Concluding Summary

This briefing paper aims to provide an introduction to the subject of Group B streptococcus (GBS) infection in neonates (newborn babies).

Over the period 2001 to 2010 there were **11 officially recorded infant deaths** in Northern Ireland, where the cause of death was registered as GBS as either the primary cause (5 deaths) or the secondary cause of death (6 deaths).<sup>50</sup> These numbers may not reflect the full picture if, for example, there are stillbirths caused by GBS. It is clear that according to published figures for the period 2001 to 2009, the incidence of GBS in Northern Ireland was consistently higher in Northern Ireland than in England and Wales for both early-onset and late-onset cases.

There appears to be general agreement that Intrapartum Antibiotic Prophylaxis (IAP), is currently the recommended way to reduce the risk of neonatal GBS transmission and disease but the main controversy that exists is the method used to select women ‘at risk’ to be given the IAP treatment. A variety of policy and guidance documents were reviewed from the UK and some other countries including the USA, Canada and

<sup>48</sup>Extract from Brocklehurst, P. and Kenyon, S (2008), Evaluation of antenatal screening for Group B Streptococcal (GBS) carriage against NSC Handbook Criteria, [www.screening.nhs.uk/policydb\\_download.php?doc=44](http://www.screening.nhs.uk/policydb_download.php?doc=44)

<sup>49</sup> [www.meningitis.org/disease-info/types-causes/gbs](http://www.meningitis.org/disease-info/types-causes/gbs)

<sup>50</sup> Source: Personal Communication with Chair of NICORE (Neonatal Intensive Care Outcomes Research and Evaluation), original source of information - General Register Office

Australia and from this there seem to be two main approaches to selecting pregnant women requiring IAP treatment during labour.

Firstly in the UK, a **risk-factor based** approach is generally used as advocated by the Royal College of Obstetricians and Gynaecologists (RCOG) which recommends that IAP is offered to all pregnant women with recognised risk factors for early-onset GBS disease as, “...*there is still no clear evidence to show that screening all pregnant women (for GBS carriage) in the UK would be beneficial overall*”.<sup>51</sup>

The second approach to selecting women requiring the IAP treatment is a **prenatal culture-based screening test** for all pregnant women at 35-37 weeks gestation where a swab is placed into a selective enrichment broth medium for 24-48 hours. This is known as the ECM test (Enriched Culture Medium) and is recognised as the ‘gold standard’ for detecting GBS. This approach is widely adopted in many countries, including the USA, Australia, New Zealand, Germany, Italy, Spain and Canada.

The briefing also touches on some of the research evidence that conflicts with the present UK position not to universally screen all pregnant women for GBS carriage. Also highlighted is research indicating that even where universal screening is recommended, there appears to remain differences of clinical opinion over a universal antenatal screening policy versus support for a risk-factor based approach.<sup>52</sup>

The briefing also highlights the need for further research in many areas from enhanced surveillance to more rapid GBS test development.

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<sup>51</sup> <http://www.rcog.org.uk/womens-health/clinical-guidance/preventing-group-b-streptococcus-gbs-infection-newborn-babies>

<sup>52</sup> McLaughlin K. and Crowther C. (2010) [Universal antenatal group B streptococcus screening? The opinions of obstetricians and neonatologists within Australia.](#) Aust N Z J Obstet Gynaecol, **50**(5):410-2.