Group B Strep in Pregnancy: Evidence for Antibiotics and Alternatives

© By Rebecca Dekker, PhD, RN, APRN.

What is Group B Strep?

Group B *Streptococcus* (GBS) is a type of bacteria that can cause illness in people of all ages. In newborns, GBS is a major cause of meningitis (infection of the lining of the brain and spinal cord), pneumonia (infection of the lungs), and sepsis (infection of the blood) (CDC 1996; CDC 2005; CDC 2009).

Group B strep lives in the intestines and migrates down to the rectum, vagina, and urinary tract. All around the world, anywhere from 10-30% of pregnant women are "colonized" with or carry GBS in their bodies (Johri et al. 2006). Using a swab of the rectum and vagina, women can test positive for GBS temporarily, on-and-off, or persistently (CDC 2010).

Being colonized with GBS does not mean that a woman will develop a GBS infection. Most women with GBS do not have any GBS infections or symptoms. However, GBS can cause urinary tract infections, pre-term birth, and GBS infections in the newborn (Valkenburg-van den Berg et al. 2009; CDC 2010).

In this article, I will focus on Group B Strep in pregnancy in the United States, along with some information about other countries.

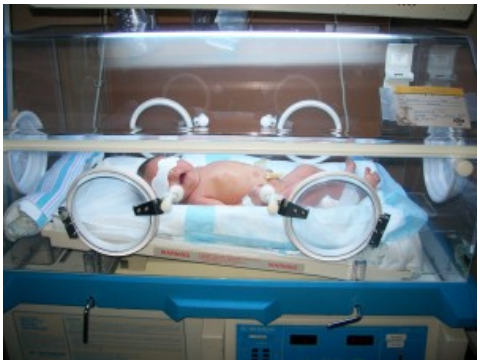
Are some women more likely to carry GBS?

Researchers have looked at the risk factors for GBS in young, non-pregnant women (Feigin, Cherry et al. 2009). Women with these factors may be more likely to carry GBS:

- African-American
- Multiple sexual partners
- Male-to-female oral sex
- Frequent or recent sex
- Tampon use
- Infrequent handwashing

- Less than 20 years old

How often do newborns become infected with GBS?



Ashley's baby was born with an early GBS infection. Ashley tested positive for GBS but her doctor's office forgot to give her the test results. As a result, she did not receive antibiotics during labor.

There are 2 main types of GBS infection in newborns: early infection and late infection. In this article we will focus on **early infection**, which occurs in the first 7 days after birth. When a baby has an early GBS infection, symptoms usually appear within the first 12 hours, and almost all babies will have symptoms within 24-48 hours (CDC 2010). In a study of 148,000 infants born between 2000 and 2008, almost all of the 94 infants who developed early GBS infection were diagnosed within an hour after birth—suggesting that early GBS infection probably begins *before* birth (Tudela et al. 2012).

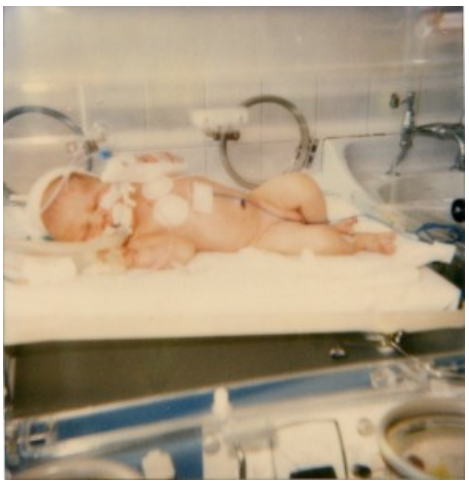
Early infection is caused by direct transfer of GBS from the mother to the baby, usually after the water breaks. The bacteria travel up from the vagina into the amniotic fluid, and the fetus may accidentally swallow some of the bacteria into the lungs—leading to an early GBS infection. Babies can also get GBS on their body (skin and mucous membranes) as they travel down the birth canal. However, most of these "colonized" infants stay healthy (CDC 2010).

In 1993-1994, the American Congress of Obstetricians and Gynecologists and the American Academy of Pediatrics recommended screening all pregnant women for GBS and treating GBS-positive women with intravenous (IV) antibiotics during labor. Since that time, we have seen a remarkable drop in early GBS infection rates in the U.S.—from 1.7 cases per 1,000 births in the early 1990's, to 0.25 cases per 1,000 births today (CDC 2012).

If a mother who carries GBS is not treated with antibiotics during labor, the baby's risk of becoming colonized with GBS is approximately 50% and the risk of developing a serious, life-threatening GBS infection is 1 to 2% (Boyer & Gotoff 1985; CDC 2010; Feigin, Cherry et al. 2009). As I noted earlier, being colonized is not the same thing as having an early GBS infection– most colonized babies stay healthy.

On the other hand, **if a woman with GBS is treated with antibiotics during labor**, the risk of her infant developing an early GBS infection drops by 80%. So for example, her risk could drop from 1% down to to 0.2%. (Ohlsson 2013)

What is the risk of death if the baby has an early GBS infection?



This photo was taken in 1985 of a baby boy who was diagnosed with a meningitis GBS infection during his first day of life. This was

before antibiotics were given during labor for GBS. According to his mom, this baby was a "fighter" and miraculously survived. He was diagnosed with a seizure disorder at the age of 11.

Researchers have estimated that the death rate from early GBS infection is 2 to 3% for full-term infants. This means of 100 babies who have an actual early GBS infection, 2-3 will die. Death rates from GBS are much higher (20-30%) in infants who are born at less than 33 weeks gestation (CDC 2010).

Although the death rate of GBS is relatively low, infants with early GBS infections can have long, expensive stays in the intensive care unit. Researchers have also found that up to 44% of infants who survive GBS with meningitis end up with long-term health problems, including developmental disabilities, paralysis, seizure disorder, hearing loss, vision loss, and small brains. Very little is known about the long-term health risks of infants who have GBS without meningitis, but some may have long-term developmental problems (Feigin, Cherry et al. 2009; Libster et al. 2012).

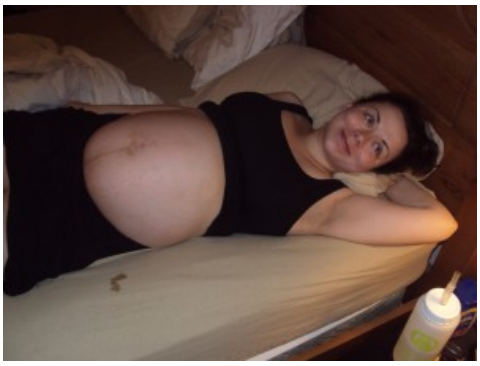
Are some newborns more likely to get early GBS disease?

The primary risk factor for early GBS infection is when the mother carries GBS. However, there are some things that increase the risk of early GBS infection:

- Being African American (CDC 2012)
- *Being born at less than 37 weeks (Boyer &Gotoff 1985; Velaphi et al. 2003; Heath et al. 2009)
- *A long period between water breaking and giving birth (Boyer &Gotoff 1985; Velaphi et al. 2003; Heath et al. 2009)
- Water broke before going into labor (premature rupture of membranes) (Adair et al. 2003)
- *High temperature during labor (> 99.5 F or 37.5 C) (Boyer & Gotoff 1985; Adair et al. 2003; Velaphi et al. 2003; Heath et al. 2009)
- Infection of the uterus (aka "chorioamnionitis") (Adair et al. 2003)
- Mother previously gave birth to an infant who had an early GBS infection (CDC 2010)
- Intrauterine monitoring during labor (Adair et al. 2003)

*These are the major risk factors. About 60% infants who develop early GBS infection have no major risk factors, except for the fact that their mothers carry GBS (Schrag et al. 2002).

How accurate is testing for GBS?



Sarah chose not to get tested for GBS and gave birth at home without antibiotics.

The CDC recommends measuring GBS with a culture test at 35-37 weeks of pregnancy. This is done by swabbing the rectum and vagina with a Q-tip, and then waiting to see if GBS grows. It takes about 48 hours to get the results back. The goal is to get the results back before labor begins (CDC, 2010).

A culture test during labor is considered the "gold standard," but this method is not used in practice because it takes too long to get results back. In a recent, high-quality study, researchers did the culture test twice– once at 35-36 weeks and once during labor. They compared the 35-36 week test to the gold standard.

Of the women who screened negative for GBS at 35-36 weeks, 91% were still GBS-negative when the gold standard test was done during labor. The other 9% became GBS positive. These 9% were "missed" GBS cases, meaning that these women had GBS, but most (41 out of 42) did not receive antibiotics.

Of the women who screened positive for GBS at 35-36 weeks, 84% were still GBS positive when the gold standard test was done during labor. However, 16% of the GBS-positive women became GBS-negative by the time they went into labor. These 16% received unnecessary antibiotics (Young et al. 2011).

Is there a faster test that could be used in labor?

It's possible that a rapid-test for GBS during labor may be a better option for some women. In the same study mentioned above, researchers compared the 35-36 week culture test and the in-labor rapid test to the gold-standard test (culture during labor).

The researchers found that the 35-36 week culture test only identified 69% of the women who actually had GBS during labor. Meanwhile, the in-labor rapid test was much more sensitive—it identified 91% of women with GBS during labor (Young et al. 2011).

In a 2012 study in France, researchers followed a hospital as it switched from prenatal testing to in-labor testing for GBS. With the in-labor rapid GBS test, more mothers with GBS were identified (17% vs. 12%), there were fewer cases of early GBS infection in newborns (0.5% vs. 0.9%), and the financial cost was the same (El Helali et al. 2012).

One drawback of rapid-testing is that it can still take up to 60 minutes to get the results back, and women would have to wait to get antibiotics until the results came in (Honest et al. 2006; Young et al. 2011). The CDC says that the ideal rapid test for GBS could be done at the bedside in less than 30 minutes (CDC, 2010).

Right now there is one rapid GBS test on the market that claims it can be done within 30 minutes. However, a researcher who used this test in a clinical study says that this same test actually takes 50 minutes to carry out—5 minutes to prepare the sample, and 45 minutes to run the results (Personal communication, M. Hacker, April 2013). The price of this test is not listed online– so we don't know if it's affordable. Finally, researchers have not done studies yet to find out whether the rapid test is cost-effective.

What is the evidence for antibiotics during labor to prevent early GBS infection?

To answer this question, I will walk you through **the most important studies** that led to how we most commonly try to prevent early GBS infections in the U.S. today.

GBS emerged as a widespread threat to newborns in the early 1970's. At that time, 1.7 of every 1,000 infants had early GBS infection (CDC 2010). In 1973, a researcher proposed giving pregnant women penicillin to stop early GBS infections in infants (Franciosi et al. 1973).

First, researchers tried giving penicillin to women before labor, but this didn't work. Although penicillin temporarily lowered GBS levels, by the time women went into labor the GBS levels were back up again (Gardner et al. 1979).

Abbi laboring in the hospital with antibiotics for GBS.

Next, researchers tried giving antibiotics to women with GBS during labor. In the late 1980's, three groups of researchers in the U.S., Spain, and Finland randomly assigned women with GBS to either receive IV antibiotics during labor (penicillin or ampicillin) or no antibiotics (Boyer & Gotoff 1985; Tuppurainen and Hallman 1989; Matorras et al. 1991).

In a recent Cochrane review, researchers combined the results of these 3 studies that had a total of 500 pregnant women. They found that when women with GBS had antibiotics during labor, their infants risk of catching early GBS infection dropped by 83% (Ohlsson & Shah 2013).

As the Cochrane reviewers noted, there were quite a few limitations to these 3 studies. In their summary, the reviewers said "There is no valid information from these three small, old, and biased trials to inform clinical practice." However, this statement is biased. A **more appropriate conclusion** would be that there is some valid information from these studies, along with some limitations to the evidence.

Based on information from these 3 studies, in 1996, the CDC recommended 2 ways to prevent early GBS infections:

1. **The "universal approach."** Screen all pregnant women at 35-37 weeks and treat everyone who is positive with antibiotics during labor *(this is the method that is currently used in the U.S.)*
2. **The"risk-based approach."** Treat laboring women with antibiotics if they have one or more of these risk factors: GBS in the urine at any point in pregnancy, previously gave birth to an infant with early GBS infection, goes into labor at less than 37 weeks, has a fever during labor, or water has been broken for more than 18 hours *(this is the method that is currently used in the United Kingdom)*

Traci, who was GBS positive, labored without antibiotics in a hospital.

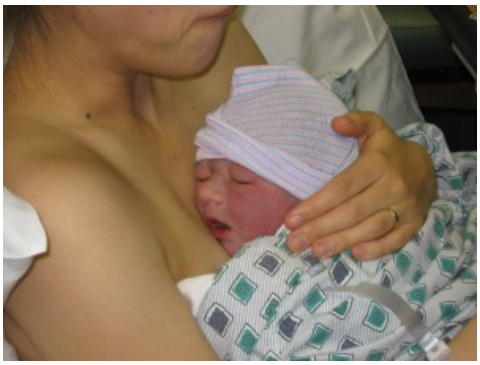
In 2002, the CDC revised their guidelines to recommend the universal approach. This decision was based on an important study published in the New England Journal of Medicine (Schrag et al. 2002). In this study, researchers used CDC lab results and chart reviews to look at 629,912 live births that took place in the U.S. between the years 1998-1999.The researchers randomly selected 5,144 of these births to study, plus all 314 infants who were born with early GBS. They used hospital records to label women as receiving the universal approach (52%) or the risk-based approach (48%).

The results? There were 0.5 infants born with GBS per every 1,000 women. Women in both groups received antibiotics about a third of the time. But women whose care providers used the universal approach had a 54% reduction in the risk of early GBS infection compared to women whose care providers used the risk-based approach**. This means that the universal approach worked better than the risk-based approach.**

In 2002-2003, the same group of researchers looked at 819,528 births in the U.S. to see whether the revised guidelines had been put into practice. Like the previous study, the researchers picked a random sample of women and infants to analyze, along with the 254 infants who had early GBS infection. **Between 1999 and 2002, use of the universal approach rose from about 50% to 85%, and use of antibiotics during labor rose from 27% to 32%.**

This time around, there were 0.32 infants born with early GBS per every 1,000 women (down from 0.5 cases per 1,000 only four years earlier). When researchers looked at the infants born at 37 weeks or later who had early GBS, only 18.0% were born to women who were not screened. **Most of the cases of GBS in term infants (61%) happened in women who had been screened but tested negative for GBS.** The researchers concluded that universal screening and antibiotic use cannot be expected to prevent 100% of early GBS infections, and that if we want to further lower GBS infection rates, then we will need access to rapid testing and vaccines against GBS (Van Dyke et al. 2009).

What is the best time to receive antibiotics for GBS?



Amy and her 3rd son. Amy was GBS positive but did not have antibiotics– her son was born 27 minutes after her first real contraction!

The CDC recommends that antibiotics be given every 4 hours, starting more than 4 hours before birth. Recent evidence supports these recommendations. In 2013, researchers looked at 7,691 live births that took place during 2003-2004 in the U.S. (randomly selected out of >600,000 births), along with 254 infants who had early GBS infection (Fairlie et al., 2013). About 1 in 3 women had antibiotics during labor (31%), and 59% of women received antibiotics more than 4 hours before birth.

When penicillin or ampicillin was given more than 4 hours before birth, it was effective 89% of the time. In contrast, giving antibiotics 2-4 hours before birth was effective 38% of the time. Antibiotics given less than 2 hours before birth were effective 47% of the time. When Clindamycin (another antibiotic) was used in place of penicillin, it worked very poorly (only 22% effective). There was no statistical difference between the 2-4 hour window and the 2-0 hour window, so even though the percentages look different, they are not statistically significant.

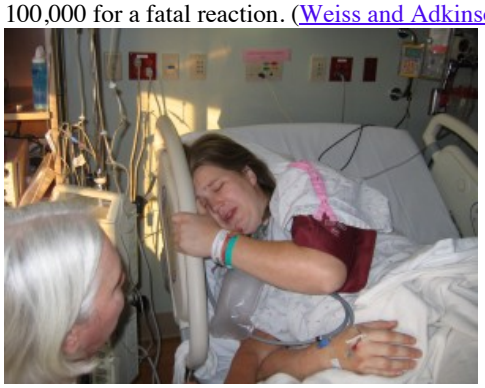
What are the potential benefits and harms of the universal screening and treatment approach?

Potential Benefits:

- In clinical trials, using antibiotics (penicillin or ampicillin) decreases the risk of early GBS infection by 83%, although there are limitations to the quality of this evidence (Ohlsson 2013)
- Penicillin rapidly crosses the placenta into the fetal circulation (at non-toxic levels) and can prevent GBS from growing in the fetus or newborn (CDC 2010; Barber et al. 2008).
- In large studies in the U.S., the universal approach (screening and treating all GBS-positive women with antibiotics during labor) is associated with lower rates of GBS infections than giving antibiotics based on risk factors alone (Schrag et al. 2002).
- Antibiotic resistance has not been a problem with penicillin, the drug most commonly used to prevent early GBS infection (CDC 2010).

Potential harms:

- Although rare, severe allergic reactions in mothers have been reported. The risk is estimated to be 1 in 10,000 for a severe reaction, and 1 in 100,000 for a fatal reaction. (Weiss and Adkinson 1988).



Jen had a successful VBAC after laboring with antibiotics for Group B Strep.

- There is an increase in the risk of maternal and newborn yeast infections. In one study, 15% of women who received antibiotics in labor had mother-baby yeast infections, compared to 7% of mothers who did not have antibiotics. (Dinsmoor et al. 2005).
- Other potential harms have to do with side effects related to the antibiotic that is used (click on the link to see a comprehensive list of potential side effects for each antibiotic, but keep in mind that most of the serious risks are rare): Penicillin, ampicillin, cefazolin, clindaymycin, and vancomycin.
- The potential medicalization of labor and birth (RCOG 2003).

What are the best antibiotics for someone who is allergic to penicillin?

Many women who have an allergy to penicllin can take **Cefazolin** instead. One advantage to Cefazolin is that (like penicillin) it crosses the placenta and reaches the fetus's bloodstream. If a woman is at high risk for anaphylaxis with penicillin (click here to find out more), then the CDC recommends several different antibiotics instead of Cefazolin. Which antibiotic a woman can take depends on the results of her GBS lab tests. Alternative antibiotics include **clindaymycin** and **vancomycin**.

Bridget and her 11 pound son shortly after birth. Bridget was GBS positive and had 2 doses of antibiotics through a heplock. In between doses she was unhooked from the IV pole.

Unfortunately, **clindamycin and vancomycin have never been tested in clinical trials for the prevention of early GBS infection**. Clindamycin faces high rates of drug resistance, barely reaches the fetal bloodstream, and should never be used unless a woman's GBS has been specifically tested and it is known that these antibiotics will work on her particular strain of GBS. Vancomycin can be used in someone who is highly allergic to penicillin and whose GBS is resistant to clindamycin. However, Vancomycin barely crosses the placenta to get into the fetal circulation. Finally, although some care providers may use erythromycin to prevent early GBS, the CDC states that **erythromycin should never be used** to prevent early GBS infection (CDC, 2010; Pacifici 2006).

If I have antibiotics, does this mean I will be continuously hooked up to an IV?

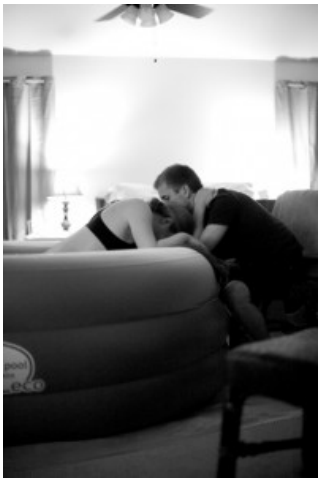
No. If you use the antibiotics, you will have an IV placed, but it only takes 15-30 minutes for the antibiotics to run in. The antibiotics are only given every 4 hours until birth, which for many women is only once or twice. When the IV is running, it should not limit positioning, walking, or even laboring in water. For the hours in between, the IV can be "hep-locked" or "saline-locked" and detached, so that you are free from the IV pole. For more information about saline locks, please read my article about saline locks during labor here.

Are there any other options?

One alternative to the universal approach is the **"risk-based approach."** This is when you receive antibiotics based on other risk factors such as having a fever or your water being broken for more than 18 hours. This alternative is no longer recommended by the CDC. The number of women who receive antibiotics is roughly the same whether you choose the universal approach or the risk-based approach—about 30%. However, as already mentioned, evidence from large multi-state studies shows that in the U.S., the universal approach is more effective than giving antibiotics based on risk factors alone.

Chlorhexadine (aka Hibiclens) is a topical disinfectant that kills bacteria on contact. It binds easily to the skin and mucous membranes. In the vagina, the anti-GBS effects of chlorhexadine last from 3-6 hours. Chlorhexadine has been shown to be safe, is easy to administer, and only costs a few cents per use (Goldenberg et al. 2006).

However, although chlorhexadine reduces the risk of a newborn being colonized with GBS, it has not been shown to decrease the risk of actual GBS infections in newborns. As I said earlier in the article, there is a difference between being colonized and being infected. Colonized babies almost always stay healthy, while infected babies are very sick, and it is thought that an actual early GBS infection occurs when the fetus swallows infected amniotic fluid into the lungs. In a Cochrane review (Stade et al. 2004), researchers combined results from 5 randomized, controlled trials that compared vaginal chlorhexadine to a placebo on outcomes of 2,190 infants born to women who were GBS positive. There was a wide range in the quality of the studies, with only one study being very high quality.



Lisa chose to use a hibiclens wash. She used it nightly for the last few weeks of pregnancy. During labor she washed after using the restroom and every 4 hours.

Even though women who used vaginal chlorhexadine reduced their infants' risk of being colonized with GBS by 28%, there was no difference in rates of early GBS infection between women who used the chlorhexadine and those who did not. There were no cases of infant deaths from GBS in either group. The only adverse effects that were reported were stinging and irritation. The researchers called for a large clinical trial to test chlorhexadine for the prevention of early GBS.

Chlorhexadine may potentially be beneficial for women living in poor countries where access to antibiotics is limited. In their review of the literature, Goldenberg et al. (2006) found 2 studies from developing countries (Egypt and Malawi) where researchers tested chlorhexadine in the vagina every 4 hours during labor and neonatal wipes shortly after birth. This is a lower level of evidence than the studies listed above, because neither of these were randomized, controlled trials. Instead, the researchers followed hospitals over a period of months when: 1) they did not use chlorhexadine, 2) they used chlorhexadine, and 3) they stopped using chlorhexadine. In both studies, researchers found that when chlorhexadine was used, there were immediate drops in newborn hospital admissions, newborn sepsis admissions, and newborn deaths due to infections. Unfortunately, researchers did not specifically count the number of GBS infections, just the overall number of babies who had admissions for sepsis.

So is chlorhexadine effective? The bottom line is that we don't know with any certainty if it helps or not. Randomized, controlled trials show that in developed countries, chlorhexadine wipes during labor do not make any difference in early GBS infection rates. However, evidence from developing countries shows that chlorhexadine vaginal wipes PLUS newborn wipes may reduce sepsis rates in general. Chlorhexidine is likely better than nothing, but it cannot prevent the ascent of GBS in the amniotic fluid unless it is given before a woman's water breaks and repeated before its effect

wears off. Unlike IV antibiotics, there is no evidence that chlorhexadine can stop GBS from growing in the fetus before birth.

Garlic has antibacterial properties, and some websites recommend putting garlic in the vagina to eliminate GBS before the GBS test. However, there is very little evidence to back up this treatment. One group of researchers put garlic extract and GBS in a petri dish together (Cutler et al., 2009). They found that the garlic was able to kill the GBS within about 3 hours. However, this treatment has never been tested in people. Also, it's important to understand that back in the 1970's when researchers tried using penicillin during pregnancy, they found that the antibacterials temporarily lower levels of GBS, but levels almost always go up again by the time women go into labor. So by temporarily using garlic, this could help you get a negative test result, but the effect will wear off very quickly.

Some women choose to **keep garlic or chlorhexidine in the vagina for the last 4 weeks of pregnancy** or use either of these treatments regularly before their water breaks and before they go into labor. It's possible that this may help decrease GBS levels before labor. However, we do not have any research evidence yet to support this practice. This means we have little evidence about the potential benefits and harms. For example, it is possible that long-term garlic or chlorhexidine use could potentially or theoretically have unexpected effects like premature rupture of membranes or increase other bacteria– even GBS– due to destruction of good bacteria, like lactobacilli. Until researchers examine the potential benefits and harms, there are a lot of unknowns related to this treatment.

Vaccines for GBS are under development, but are not available yet at this time (World Health Organization, 2005). There is a big push for a GBS vaccine for several reasons: 1) in-labor antibiotics do not prevent GBS infection 100% of the time (Velaphi et al., 2003), 2) in-labor antibiotics can have side effects, and 3) in-labor antibiotics do not prevent other GBS problems, such as preterm labor.

Taking probiotics (lactobacilli) is another remedy that people sometimes use to eliminate GBS in the vagina. In several studies, researchers have put vaginal lactobacilli (including a commercially available version) in a petri dish with different strains of GBS. They found that the lactobacilli strongly inhibited the growth of GBS by increasing the acidity of the environment. (Acikgov, 2005– article in Turkish; Zarate, 2006).

In a small clinical trial, researchers randomly assigned healthy, fertile (but non-pregnant) women to wear panty liners that were saturated with probiotics, or to wear placebo panty liners. The results showed that it is possible to transfer probiotics to the vagina using panty liners. The researchers also found that women who had higher levels of lactobacilli in the vagina had lower levels of GBS. However, although these results are promising, large clinical trials need to be conducted in pregnant women to determine if this is an effective way to prevent early GBS infection in newborns (Rönnqvist PD, 2007).

A few websites mention **colloidal silver** as a remedy for preventing GBS infection. Although silver has anti-bacterial properties, no known research studies have ever been conducted on taking colloidal silver to prevent a GBS infection—and no studies have ever looked at the safety of colloidal silver in pregnancy. The potential benefits and harms of this substance are unknown. In 1997, the FDA stated that colloidal silver is not safe or effective for any condition.

Can infants acquire a GBS infection from staff handling the newborn?

Barbara decided not to have antibiotics for GBS. Her daughter was born at home.

Researchers are quite certain that infants catch early GBS infections before they are born—most likely from GBS in the amniotic fluid. As mentioned earlier, almost all infants with early GBS infection show symptoms within an hour after birth. However, infants can catch "later" GBS infections from the hospital (nursery, hands of hospital staff and family members) or the community. This is one reason hand-washing is so important (Kliegman et al. 2011).

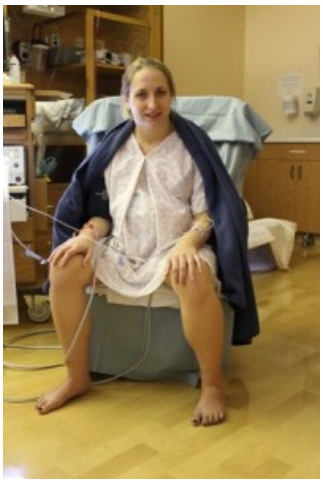
If I am GBS positive, and I don't get the IV antibiotics for some reason, what kind of tests will my baby need to have?

As long as your baby appears to be doing well and you did not have any additional risk factors (<37 weeks, infection of the uterus, water broken >18 hours), then there is no need for your baby to have any special testing. There are some situations where the CDC recommends that a well-appearing infant have some blood tests. The CDC also recommends 48 hours of "observation"for infants who are born to GBS positive mothers, but there is no need to separate mom and baby for this observation period. To see a flow-chart with more details about newborn testing and observation, click here.

What do national organizations have to say?

In the **United States:**

The U.S. Centers for Disease Control and Prevention recommends universal screening for GBS at 35-37 weeks and in-labor antibiotics for all women who test positive.



Kimberly laboring with
antibiotics for GBS

- American Congress of Obstetricians and Gynecologists
- American Academy of Pediatrics
- American College of Nurse-Midwives
- American Academy of Family Physicians
- American Society for Microbiology

In the **United Kingdom:**

- The United Kingdom National Screening Committee states that pregnant women in the UK should not be screened for GBS. The UK follows the risk-based approach. This includes giving antibiotics in-labor to all women who have fever, prolonged rupture of membranes >18 hours, GBS in urine at any time during pregnancy, preterm labor, or a prior infant with GBS. This means that many women who are actually GBS negative receive antibiotics directed at GBS, just based on their risk factors. In the UK, the rate of early GBS infections is 0.5 per 1,000 births, which is slightly higher than the rate of 0.2 per 1,000 births in the U.S. In the UK, it is not considered cost effective to screen the whole population of pregnant women to lower the early GBS infection rate by 0.2-0.3 cases per 1,000.
- The Royal College of Obstetricians does not recommend routine screening for GBS during pregnancy. However, they do state that in-labor antibiotics could be considered if GBS was detected in passing or if women have any of the risk factors listed above. Many women are already receiving antibiotics for these reasons.
- There is controversy in the UK over the lack of access to GBS testing within the National Health Service. Group B Strep Support is a consumer-based charity that advocates for women to have access to GBS screening in the UK.

In Canada:

- The Society of Obstetricians and Gynaecologists of Canada (SOGC) recommends offering GBS screening to all pregnant women and treating those who are positive with IV antibiotics.

What is the bottom line?

- Since two-thirds of remaining early GBS infections are now due to false negative GBS test results, in the future we may benefit from a rapid in-labor test for GBS
- While probiotics, chlorhexadine, and garlic have the potential to reduce vaginal and newborn colonization with GBS, we do not have evidence yet to show that these strategies can prevent early GBS infections, since GBS infection usually occurs when GBS gains access to the amniotic fluid and gets into the fetus' lungs during labor.

Ashley's baby, a survivor of GBS, healthy at 6 months old.

*I would like to acknowledge my reviewers for helping maintain the quality of articles published at Evidence Based Birth. In particular, I would like to acknowledge **Dr. Jessica Illuzzi**, Associate Professor of Obstetrics, Gynecology, and Reproductive Sciences at Yale School of Medicine, for her expert review and assistance in writing this article. I would also like to acknowledge my 2 regular physician reviewers, and 2 other anonymous peer reviewers (a GBS rsearcher and a microbiologist).*

This blog article will be open to public comments for 2 weeks, starting Tuesday, April 9. After this period of open commenting is over, I will take peoples' comments into consideration and make additions or revisions to the article.

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References

1. Adair, C. E., L. Kowalsky, et al. (2003). "Risk factors for early-onset group B streptococcal disease in neonates: a population-based case-control study." CMAJ 169(3): 198-203. Click here.
2. Ackigov, Z. C., S. Gamberzade et al. (2005). "Inhibitor effect of vaginal lactobacilli on group B streptococci." Mikrobiyol Bul 39(1): 17-23. (Article in Turkish and unable to translate). Click here.
3. Barber, E. L., G. Zhao, et al. (2008). "Duration of intrapartum prophylaxis and concentration of penicillin G in fetal serum at delivery." Obstetrics and gynecology 112(2 Pt 1): 265-270. Click here.
4. Boyer, K. M. and S. P. Gotoff (1985). "Strategies for chemoprophylaxis of GBS early-onset infections." Antibiot Chemother 35: 267-280. Click here.
5. Centers for Disease Control and Prevention (CDC) (2009). "Trends in perinatal group B streptococcal disease- United States, 2000-2006." MMWR Morb Mortal Wkly Rep 58: 109-112.
6. CDC (2010). "Prevention of perinatal group b streptococcal disease." MMWR 59: 1-32. Click here.
7. CDC (2012). "ABCs report: Group B streptococcus, 2010." Retrieved March 10, 2013. Click here.
8. CDC (1996). "Prevention of perinatal group B streptococcal disease: a public health perspective. ." MMWR Recomm Rep 45: 1-24.
9. CDC (2005). "Early-onset and late-onset neonatal group B streptococcal disease– United States, 1996-2004." MMWR Morb Mortal Wkly Rep 54: 1205-1208.
10. Cutler, R. R., Odent M, et al. (2009). In vitro activity of an aqueous allicin extract and a novel allicin topical gel formulation against Lancefield group B streptococci. J Antimicrob Chemother 63(1): 151-154. Click here.
11. Dinsmoor, M. J., R. Viloria, et al. (2005). "Use of intrapartum antibiotics and the incidence of postnatal maternal and neonatal yeast

infections." Obstetrics and gynecology 106(1): 19-22. Click here.
12. El Helali, N., Y. Giovangrandi, et al. (2012). "Cost and effectiveness of intrapartum group B streptococcus polymerase chain reaction screening for term deliveries." Obstetrics and gynecology 119(4): 822-829. Click here.
13. Fairlie, T., E. R. Zell, et al. (2013). "Effectiveness of intrapartum antibiotic prophylaxis for prevention of early-onset group b streptococcal disease." Obstetrics and gynecology 121(3): 570-577. Click here.
14. Feigin, R. D., J. D. Cherry, et al. (2009). Textbook of Pediatric Infectious Diseases, Saunders.
15. Franciosi, R. A., J. D. Knostman, et al. (1973). "Group B streptococcal neonatal and infant infections." J Pediatr 82(4): 707-718. Click here.
16. Gardner, S. E., M. D. Yow, et al. (1979). "Failure of penicillin to eradicate group B streptococcal colonization in the pregnant woman. A couple study." Am J Obstet Gynecol 135(8): 1062-1065. Click here.
17. Goldenberg, R. L., E. M. McClure, et al. (2006). "Use of vaginally administered chlorhexidine during labor to improve pregnancy outcomes." Obstetrics and gynecology 107(5): 1139-1146. Click here.
18. Heath, P. T., G. F. Balfour, et al. (2009). "Group B streptococcal disease in infants: a case control study." Arch Dis Child 94(9): 674-680. Click here.
19. Honest, H., S. Sharma, et al. (2006). "Rapid tests for group B Streptococcus colonization in laboring women: a systematic review." Pediatrics 117(4): 1055-1066. Click here.
20. Johri, A. K., L. C. Paoletti, et al. (2006). "Group B Streptococcus: global incidence and vaccine development." Nat Rev Microbiol 4(12): 932-942. Click here.
21. Kliegman, R. M., B. F. Stanton, et al. (2011). Nelson Textbook of Pediatrics, Saunders.
22. Libster, R., K. M. Edwards, et al. (2012). "Long-term outcomes of group B streptococcal meningitis." Pediatrics 130(1): e8-15. Click here.
23. Mandell, G. L., J. E. Bennett, et al. (2010). Principles and practice of infectious diseases, Elsevier.
24. Matorras, R., A. Garcia-Perea, et al. (1991). "Maternal colonization by group B streptococci and puerperal infection; analysis of intrapartum chemoprophylaxis." Eur J Obstet Gynecol Reprod Biol 38(3): 203-207. Click here.
25. Ohlsson, A. and V. S. Shah (2013). "Intrapartum antibiotics for known maternal Group B streptococcal colonization." Cochrane Database Syst Rev 1: CD007467. Click here.
26. Ronnqvist, P.D., U. B. Forsgren-Brusk, et al. (2006). "Lactobacilli in the female genital tract in relation to other genital microbes and vaginal pH." Acta Obstet Gynecol Scand 85(6): 726-735. Click here.
27. Schrag, S. J., E. R. Zell, et al. (2002). "A population-based comparison of strategies to prevent early-onset group B streptococcal disease in neonates." N Engl J Med 347(4): 233-239. Click here.
28. Stade, B., V. Shah, et al. (2004). "Vaginal chlorhexidine during labour to prevent early-onset neonatal group B streptococcal infection." Cochrane Database Syst Rev(3): CD003520. Click here.
29. Tudela, C. M., R. D. Stewart, et al. (2012). "Intrapartum evidence of early-onset group B streptococcus." Obstetrics and gynecology 119(3): 626-629. Click here.
30. Tuppurainen, N. and M. Hallman (1989). "Prevention of neonatal group B streptococcal disease: intrapartum detection and chemoprophylaxis of heavily colonized parturients." Obstetrics and gynecology 73(4): 583-587. Click here.
31. Valkenburg-van den Berg, A. W., A. J. Sprij, et al. (2009). "Association between colonization with Group B Streptococcus and preterm delivery: a systematic review." Acta obstetricia et gynecologica Scandinavica 88(9): 958-967. Click here.
32. Van Dyke, M. K., C. R. Phares, et al. (2009). "Evaluation of universal antenatal screening for group B streptococcus." N Engl J Med 360(25): 2626-2636. Click here.
33. Velaphi, S., J. D. Siegel, et al. (2003). "Early-onset group B streptococcal infection after a combined maternal and neonatal group B streptococcal chemoprophylaxis strategy." Pediatrics 111(3): 541-547. Click here.
34. Weiss, M. E. and N. F. Adkinson (1988). "Immediate hypersensitivity reactions to penicillin and related antibiotics." Clin Allergy 18(6): 515-540. Click here.
35. WHO. State of the art of vaccine research and development: Initiative for Vaccine Research. 2005. [online] http://www.who.int/vaccine_research/documents/Dip%20814.pdf.
36. Young, B. C., L. E. Dodge, et al. (2011). "Evaluation of a rapid, real-time intrapartum group B streptococcus assay." Am J Obstet Gynecol 205(4): 372 e371-376. Click here.
37. Zarate, G. & Nader-Macias, M. E. (2006). "Influence of probiotic vaginal lactobacilli on in vitro adhesion of urogenital pathogens to vaginal epithelial cells." Lett appl Microbiol 43(2): 174-178. Click here.

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42 Comments

1. Science-based Doula April 9, 2013

I would like to see these things addressed in the article:
1. The unsubstantiated claim that phrophylactic antibiotics increase the rates of other types of infection.
2. The recommendation by some birth workers (doulas, birth educators) to have sex the night before the GBS test is performed, to increase the chance that mothers will test negative.

(I liken the second one to the garlic recommendation—it seems like an attempt to simply "trick" the test, which begs the question: why even test at all, then?)

- Rebecca April 10, 2013

  I think I will try to address #1. It is true that antibiotics increase the risk of yeast infection. I have not seen any data on increasing rates of other infection, so if there is not any research on this I can't really write too much about it (if anything at all). That's the problem with sticking to the evidence– I'm not allowed to write anything unless I can find a reference for it!! As far as #2 goes, that doesn't really make sense to me since studies have shown that recent sex increases the risk that you will test positive. In one Infectious Disease textbook that I looked at, the authors hypothesized that this is because sexual activity alters the vaginal mucosa, which may make colonization more likely.

2. Pamela April 9, 2013

There are quite a few things I don't see mentioned or much focused on. The most important risk factor is pre-37 weeks. You mention that 60% of infants with early GBS don't have major risk factors present in birth. It's my understanding that about 80% of all birth infections (GBS included) is in pre-37 week births. Those two facts don't marry. Similary the mortality risk is 5 times higher in premature babies.

There's no mention of the overall lack of reduction in neonatal death by birth infection in the US following the universal screening programme. Whilst antibiotics are reducing GBS death, resistant E.coli as a cause is on the increase rendering the overall mortality rate the same. Antibiotics therefore are arguably, at the population level at least, not saving lives but changing the causative agent. This phenomenon isn't covered at all.

Also there is no mention within you potential harms, of the baby being colonised with only peniciliin (or whatever) resistant bacteria. Research I read a few years ago (so may have been updated since then) demonstrated that 90% of the gut flora is laid down during birth with the remaining 10% during the first 6 months of life, and that this birth-derived gut flora is extremely difficult, if not impossible, to permanently change. I don't doubt that there is no evidence with which to base this element of potential harm on in your piece, but surely it warrants a mention as deserving of future research?

Something else not mentioned is the increase in postive swabs when sexual intercourse has taken place in the past 24 hours, through bacteria being introduced to the vagina either from the anus or from the sexual partner. I've read at least two studies that report this phenomenon. It is important in the context of false positive and then unnecessary antibiotics treatment.

And finally, given that overall mortality rates remain the same, the implications for overuse of antibiotics ought to be mentioned.

And no, I'm not against antibiotics, but I am for a personalised, informed, evidence-based approach to GBS and other birthing issues. For the vast majority of women the antibiotics they received will have done nothing except cause damage to them and/or their baby.

- Rebecca April 10, 2013

  Hi Pamela, thanks for your suggestions. You are correct that the CDC report says that the bulk of GBS infections happen in pre-term babies. The CDC guidelines state: "On the basis of data from CDC's Active Bacterial Core surveillance (ABCs) system, a network of 10 sites across the United States that conduct active, population-based surveillance, CDC estimates that in recent years, GBS has caused approximately 1,200 cases of early-onset invasive disease per year (30); approximately 70% of cases are among babies born at term (≥37 weeks' gestation)," and they cite this study: http://jama.jamanetwork.com/article.aspx?doi=10.1001/jama.299.17.2056 However, when I go to the original source of this number, the research results state: "Among infants with early onset disease, 23% were born preterm," which does not match the CDC numbers, so I don't know where they got the 70%.

  It is interesting that in the Schrag et al. article, where I took my 61% from, they did not find this to be the case– and they used CDC

surveillance data. http://www.nejm.org/doi/full/10.1056/NEJMoa020205#t=articleResults. In that study, only 17% of the infants with GBS infections were born before 37 weeks. This 17% is fairly close to the 23% referenced above. Again, I don't know where the CDC got the 70% number. I'd hate to think it was an error on their part!

As for your other points:

- I did mention that recent or frequent sexual intercourse can increase the risk of colonization. See the beginning of the article

- The CDC has addressed the argument about the increase in e. Coli deaths and has not found evidence that this is a problem. See the CDC 2010 guidelines that you already referenced for their explanation.

-I think you make a good point about the gut flora, and I will attempt to address that in the revised version of this article, since many people are interested in it.

-I think it's important to understand that in talking to experts, I have found that the main goal for preventing GBS is to prevent the morbidity (hospitalizations) associated with GBS infections– not the mortality. Researchers and governments would not be spending so much money on early GBS infections except for the fact that they are so costly. So that is why reducing mortality is not really the end goal– the absolute risk of death with GBS is relatively low, given the neonatal care system we have in the U.S. I used to be overly focused on the mortality, too, until the researchers gently told me that, "No, reducing mortality (although nice) isn't really the point of all the money we are spending on trying to prevent GBS." Kind of an eye-opener for me.

- I disagree with your last statement. There is the potential for harms, but not every woman who receives antibiotics will necessarily be harmed. That's why we I use the phrase "potential harms" and "potential benefits." And it would be difficult– if not impossible– to be able to tell who the antibiotics helped and who they hurt, since we don't know whose babies might have had GBS but didn't, and it is very hard to link long-term effects to something like antibiotics during birth, since the research is just unfortunately not there.

-I agree, women and their partners should be given accurate info about the potential benefits and risks by their care provider and be respected as the decision-maker in birth. Two different woman could look at the data above and come to completely different conclusions– one might feel that the potential benefits outweigh the potential harms, the other feels the potential harms outweigh the potential benefits. And that's okay. We all perceive risk differently. I am not trying to argue for or against antibiotics or alternatives– I am just trying to present the evidence as best as I can.

3. 

Pamela April 9, 2013

I thought it might be helpful to add some of the references I used when researching GBS a couple of years ago:
Randomized study of vaginal and neonatal cleansing with 1% chlorhexidine (Pereira et al, 2011)
Rectal Colonization by Group B Streptococcus as a Predictor of Vaginal Colonization, (Meyn et al, 2010) – on link with recent sexual activity: a natural way of reducing risk.

4. 

Joanna Zuk April 9, 2013

I would invite you to also read and review the Association of Ontario Midwives Clinical Guideline regarding GBS management.

http://www.ontariomidwives.ca/images/uploads/guidelines/No11CPG_GBS_May_2012FINAL.pdf

All the best,
Joanna Zuk

- 

Rebecca April 10, 2013

Thank you, Joanne! I will add this to the revised version under the Canadian bullet point.

5. 

Science-based Doula April 9, 2013

Where is the support for this? "Whilst antibiotics are reducing GBS death, resistant E.coli as a cause is on the increase rendering the overall mortality rate the same. Antibiotics therefore are arguably, at the population level at least, not saving lives but changing the causative agent."

What peer-reviewed research shows a direct link between antibiotic prophylaxis to prevent GBS infection of a newborn and a rise in deaths resulting from E. Coli infection? Because I have literally only seen blog posts claiming there is a connection.

- 

  Rebecca April 10, 2013

  Hi again, as I mentioned to Pamela above, I was surprised to find out that researchers don't really consider reducing mortality to be the end-result of GBS prevention. Really what they are trying to prevent is the morbidity associated with GBS: the very expensive hospitalizations and long-term health complications (blindness, brain damage, etc.). The CDC has looked at the E. Coli issue and not found evidence supporting a link. Scroll down to "Trends in non-GBS pathogens" for their review of the literature. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5910a1.htm?s_cid=rr5910a1_w

6. 

   Science-based Doula April 9, 2013

   The CDC report linked in this article concludes that the rate of other neonatal infections has remained stable, while the rate of GBS infection has gone down.

7. 

   Elizabeth Hillman April 9, 2013

   I'm thrilled that you took on the task of reviewing this evidence. It'll take me a while to check out a lot of the papers you cited. Thank you! I am immediately curious about a few things:

   I'd love to know whether you ran across any research (beyond the intrauterine monitoring you mentioned) that examined any correlation between intrapartum interventions (vaginal exams with or without ROM, AROM and resultant artificially-prolonged ROM, etc) and the rate of GBS colonization and/or infection. Do you know of a great study that focuses on these variables? Or at least addresses them?

   Also, I realize that the scope of this article can only be so large, but I'm very curious about management approaches and GBS colonization/infection/mortality outcomes in other countries–especially ones with better infant mortality rates than the US, the UK, and Canada have currently achieved. Did you find any information about them?

   Finally, did you find any information about the ways in which risk-based management is implemented? I am familiar with universal screening and antibiotic prophylaxis protocols, and their application (based on my experience in clinical settings). I am less familiar with risk-based management. How consistent is the implementation of this older, now not-CDC-recommended approach across settings? It's been a decade since they changed their recommendation, so I wonder about those providers and their contexts. Do the providers who use risk-based management have other characteristics in common besides their GBS screening and treatment choice (for example, resource availability, patient population, practice setting)?

8. 

   Kelly April 9, 2013

   Love the article, would love to see some of the things others listed above. Also:

   1. Need for more research into increase in mortality of x8 after using scalp electrodes for internal fetal monitoring. J Matern Fetal Med 1997 Jan-Feb;6(1)35-9.

   "Mortality from early neonatal group B strep sepsis: influence of obstetric factors"

   That is a potential huge concern and red flag over which babies are dying…those for whom docs are giving free entry into the bloodstream? What if we could largely prevent GBS sepsis by avoiding invasive things like scalp electrode monitoring? What if that is a major difference in which babies get sick?

   2. The fact that the Cochrane Review from 2009 states that "This review finds that giving antibiotics is not supported by conclusive evidence." (Ohlsson, A, Shah)

   Also some other interesting research you might want to look at in my personal stash:

   3. Lett Appl Microbiol. 2006 Aug;43(2):174-80 "Influence of probiotic vaginal lactobaccili on in vitro adhesion of urogenital pathogens to vaginal epithelial cells"

4. Mikrobiyol Bul. 2005 Jan;39(1)17-23 “Inhibitor effect of vaginal lactobacilli on group b streptococci”

5. “Randomized study of vaginal chlorhexidine disinfection during labor to prevent vertical transmission of group B streptococci.” This is from Refdoc.fr, but they don’t list a full cite. 1995. vol 61, n2, p 135-142. European journal of obstetrics, gynecology, and reproductive biology. Curious about this one as it says “Vaginal disinfection with a chl. gel during labor modestly reduces GBS vertical transmission. Because the method is cheap, simple, and safe, ti should be considered for routine use. Our results indicate that ti may reduce the incidence of EOGBS sepsis by 2-32%.” It was double-blind prospective study of 1020 pregnant women.

6. What about the Fachinetti study? J Matern Fetal Neonatal Med 2001; 11:84-88. It was excluded from the Cochrane review but as best I could tell it was because there was not a control group but I can’t really tell. Cochrane says it was promising but they didn’t include it. (This is also one that I believe supports the increase in e coli, as there were significantly more e coli infections in the ampicillin group than the chlorhexidine group.)

7. Finally regarding the “where did the e coli thing come from,” I know I have read it in research (not blogs) and thought I could put my finger on it but no luck yet. My sense is that it was cited in previous CDC guidelines and the new guidelines wiped that out. I have a huge GBS binder of printed research that I will continue to look through. That said, I don’t use or report the e coli thing, just offering my sense that it did come from primary research at one time.

9. 

Kelly April 9, 2013

Found something more in the Ontario Midwives CLinical Practice Guideline No. 11 on GBS. (This is a practice guideline document, but the relevant research is documented; I have not yet read the specific studies.)

“There is also a concern that widespread IAP use my be responsible for a rise in neonatal non-GBS early-onset disease. However current available evidence is conflicting. Surveillance of 19 Connecticut hospitals between 1996 and 1999, found no significant increase in the incidence of non-GBS early onset cases…Between 1996 and 1998, researches noted a rise in the proportion of E. coli infections that were ampicillin resistant, however this proportion decreased in the final year of the study period…. Conversely, a study data from the Infection Control Surveillance Database of 20,981 live births looked at the incidence of EOGBSD and gram-negative neonatal sepsis (e.g., E. Coli…) in the years 1992-1996…”The authors also noted an increased rate of gram-negative sepsis in the same study periods. The mortality orate of gram-negative neonatal sepsis for the cases in this study was 60%, tenfold higher than the EOGBSD mortality rate.”

Here’s the study it points to: Levine, EM, Ghai V, Bartonn JJ, Strom CM. Intrapartum antibiotic prophylaxis increases the incidence of gram-negative neonatal sepsis.” Infect.Dis.Obstet.Gynecol. 1999;7

Another one that says similar:

Bizarro MG et al. Changing patterns in neonatal Escherichia coli sepsis and ampicillin resistance in the era of intrapartum antibiotic prophylaxis. Pediatrics 2008 Apr;121(4):689-696.

“A significant increase in late-onset E. Coli sepsis was also observed for both pre-term and term infants.”

Note that these quotes are from the Practice Bulletin, not the research.

HTH, this is a fascinating topic to me.

10. 

Rebecca April 9, 2013

Thank you everyone for your thoughtful comments! I plan to respond when I get a block of time where I can concentrate!

11. 

Eva Garcia April 9, 2013

what about the effect of early antibiotic exposure on the establishment of gut flora? A hugely important topic, as the gut flora drives many things and its disruption can lead to allergies, asthma, and chronic illness.

- 

Rebecca April 10, 2013

I think you're right– I need to address this in the revised version of the article. I did not see any direct evidence linking these two things. But I will dig deeper and see what I can find.

12. 

Annie Stock April 9, 2013

There was no mention of oral antibiotics vs. intravenous antibiotics. The efficacy of one vs. the other would be important. I personally chose a home birth over a hospital birth on that issue alone: the only option the hospital, any hospital, would allow was IV medication in labor, whereas the midwifery group I ended up switching to made me aware of oral antibiotics as a method for preventing GBS infection. It would be worth helping those of us who aren't as scientifically-inclined more aware of the research behind our 'options,' where options exist.

Thank you for compiling this research. It is very informative.

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Science-based Doula April 10, 2013

There is mention of oral antibiotics. They were trialled in the 70′s and are considered not effective. They have to be taken prior to labor, and by the time labor kicked in, GBS returned.

- 

Samantha McCormick April 10, 2013

The problem with oral antibiotics is that you can not be certain that you will achieve a therapeutic blood level. Gastric emptying is delayed during labor which slows the absorbtion of oral medications. The only way to be certain that you will get the correct amount of medication into circulation is to use the IV route.

I don't know your midwives and I do not mean to undermine them, but they might be lacking some education in pharmacology if they think that oral antibiotics are an acceptable alternative (or option) to IV antibiotics for prevention of GBS disease.

13. 

Blayne April 9, 2013

Re: Chlorhexadine (aka Hibiclens)
Chlorhexadine and Hibiclens are NOT synonymous. Hibiclens contains chlorhexadine, but it also contains a lot of other ingredients that may change its effectiveness for GBS. The clinical trials where NOT done with Hibiclens, they were done with a straight chlorhexadine solution.

From the Hibiclens web site:
HIBICLENS contains 4% w/v chlorhexidine gluconate, with inactive ingredients: Fragrance, isopropyl alcohol 4%, purified water, Red 40, and other ingredients, in a mild, sudsing base adjusted to pH 5.0-6.5.

I know a lot of midwives use Hibiclens because there are no commercially available straight chlorhexadine solutions (or none that I could find when I was practicing, but I've been retired for a few years), but we cannot assume the actions are the same.

- 

Rebecca April 10, 2013

Thank you Blayne!! I will fix this in the revised version. Instead of referring to Hibiclens and Chlorhexadine as synonymous, I will clarify that chlorhexadine is the active ingredient in Hibiclens.

14. 

Jen April 10, 2013

I would like to see a discussion of IgG and IgA antibodies included. From my understanding, high serum antibodies to the particular strains of GBS are protective and those women who have a significant antibody response have a reduction in transmission and infection. I wonder why more emphasis is not being put into research around understanding why out of the 10-30% of carriers 98-99% of babies do not get sick. Let's

assess the common thread among those women and have a list of factors that reduce risk. Why not work on making testing less about if GBS is present (rapid test included) and look into if women have antibodies to any of the GBS types. There could be more accurate use of antibiotics directed towards women with low antibodies. I know there are some studies that focused on IgG in light of researching vaccines such as those by Lin FY et al. 2004. What are your thoughts on this?

15. 

Cheryl Heitkamp April 10, 2013

This is a well-done and easy to read post. I would like to make one correction that is significant.
Per the CDC: http://www.cdc.gov/groupbstrep/clinicians/clinical-overview.html:
prior to universal screening, the rate of infection in newborns was 1.7/1000 in 1993.
You cite the CDC regarding a 50% transmission rate in untreated newborns, but as I read the article you cite:
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5910a1.htm?s_cid=rr5910a1_w:
50% refers to the mortality rate of GBS infected newborns, not GBS exposed newborns.
Therefore, though antibiotics have greatly reduced the rate of infection, the actual risk of infection is still quite low (1.7/1000) of the untreated population, and 50% (.9/1000) of those babies would die. Using your statement, and a 25% GBS+ rate, the death rate would be 125/1000 (using 1993 numbers).

In GBS exposed babies, the risk of infection is .0017% if the mother is untreated, not 50%.

- 

Rebecca April 10, 2013

Hi Cheryl, thanks for your comment. I think you may have misunderstood what I wrote. I did not say here was a 50% transmission rate. I did say that 50% of babies born to untreated moms are colonized, which is thought to be mostly harmless. The transmission rate for actual infection is 10-20 per 1,000 untreated positive women. I will double-check before I release the revised version, but I stand by my original numbers. Also, the current death rate of full term babies who have GBS infection is 2-3%, most definitely not 50%.

16. 

Cheryl Heitkamp April 10, 2013

Thanks for clarifying your paragraph in the post. It makes a lot more sense and makes this a great article!

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Rebecca April 10, 2013

Thank you for making me double-check my math!! I had a little bit of a heart attack when I thought I might have made such a critical error! So I was relieved to find that I had not. But I'm glad you asked, because it's important to make these clarifications. I think in the revised article I will make sure to emphasize the difference between colonization and infection, because I'm sure other people thought the same as you.

17. 

sweetPsmomma April 10, 2013

Thank you for taking the time to compile this article. My daughter was born on 11/12/2012 at 38k6d gestation. I tested negative for GBS at my 36 week OB appointment. I only labored for a total of 4 hours (amazing), and my daughter was born 1 hour after we reached the hospital. I did not have a fever during labor. My water was broken by the doctors just a few minutes before my daughter was born. She was perfect, healthy and scored high on her Apgar tested. It wasn't until about 15 hours later that she began making some grunting noises. We brought it to the attention of our nurse and our daughter was taken to the NICU to get checked out since the pediatrician found her grunting odd, but didn't know what was wrong. Within 8 hours my daugher was having seizures, needed a bloood transfusion, had to intubated, and was hooked up to about 10 different medications. She had GBS and bacterial meningitis. We were told that she would likely die that day, and the chief of the NICU sent the hospital chaplain to our room to help us "deal with what were about to go through." In two days my sweet baby girl will be 5 months old. She is God's little miracle. She had passed her hearing tests and has no major brain abnormalities showing from her last 2 CT scans. The road ahead is still somewhat unknown but we thank God that's she's alive! I'm grateful for your article as I am eager to learn more about GBS, especially as a mother who tested negative and showed no signs and my daughter had little/no risk factors. Thanks for taking the time to research. I look forward to reading up more on the articles you referenced.

- Rebecca April 10, 2013

  Thank you so much for sharing your story!! That must have been so scary. I am so glad that your daughter is alive and well today. Thank you again, I think it is important for people to understand that even though GBS infections are rare, they do happen to real people. And even though the U.S. tries to prevent as many GBS infections as we can with the universal protocol, and a lot of cases are prevented, this approach does not work 100% of the time, mostly because of what happens with women who experience false negatives on tests. Also, antibiotics, although ~80% effective, cannot prevent all cases. Again, thank you so much for sharing.

18. Laura April 10, 2013

Well done!
There is a lot of talk about newborns being colonized by heathy bacteria during a vaginal birth. It is being said that the child will have a real advantage in gut health from this.
I do not know what research backs this up but wonder what (if it is true) effect such widespread antibiotic use is having on our babies and their future health.

19. Pamela April 11, 2013

Thanks for the reponse. A couple more points. About sex and GBS you stated "- I did mention that recent or frequent sexual intercourse can increase the risk of colonization. See the beginning of the article". I see you have it as a risk factor but I suppose what I'm getting at is the emphasis. Saying it's a risk factor implies almost like an STD. What I mean is that rate of positive tests because of recent sex (like in the past 24 hours) where the woman in fact is unlikely to be a carrier. Yes this would be a reason to not have sex close to term (if GBS might be a concern) but my issue is with intervention embarked upon where the positive was in fact really a positive of the partner and something that would be gone in a day or two. I've seen a number of articles about this.

We covered the E.coli thing on facebook. I'm happy with that.

On the antibotics, I would argue that to a greater or lesser extent ALL antibiotics are harmful to everyone who has them. This might be a temporary interruption of gut flora causing digestive upset, or it might be months, even years of candidiasis (which seems to be my issue), or it might be increased susceptibility to viral infection (as seems to be the case with my first born who had viral infection in his eyes for his first year of life – and yes I realise my examples are anecdotal, though that doesn't necessarily make them untrue). Hopefully for some people having them the benefits have outweighed the cost, however the vast majority of women routinely receiving them (and their babies of course) will not have had GBS or any other kind of bacterial infection.

No time to go into it now but I am still getting confusion over the rate of cases in preterm. Will post some links later. This 70% in term babies is baffling me since I've seen many articles with vastly higher rates for all birth infection and for GBS in preterm.

Thank you for engaging with me on this topic. Any failing in the evidence is of course not your fault but the fault of funders not interested in paying for research supporting reduced intervention.

- Rebecca April 11, 2013

  Thank you for engaging with me! I am learning a lot from our conversation!

20. raizel April 11, 2013

Hi, as a homebirther who always tests positive for GBS I have done a LOT of googling on this topic. It's so nice to see all your research here in one place. My question is as follows-when GBS is present in the urine, why does that make the risk so much higher as I was told? I had made an educated decision by baby #2 not to have the antibiotics, but with baby #4, everyone was much more concerned since I had the GBS in the urine. Noone was able to explain to my WHY though!

I am an American now living in the UK and find that they over react to GBS so I'm not sure if this is due to the urine situation or just their

attitude in general.
Any light you can shed would be helpful!

21. 

Deborah April 11, 2013

I have been a home birth midwife for 30 years. I also have an RN license and worked for 11 years in a well-baby nursery and NICU, 2002 – 2013. In my homebirth practice, if a mother tests positive for GBS then I educate her about GBS and what her choices are and we come up with a plan that we both feel comfortable with. I find that many women do not want to take antibiotics. However, occasionally a mother will decide to take antibiotics and I have done IV PCN at home.

This is a subject that I've done a lot of studying on because I want to provide the best care for the mothers and babies that I take care of.

I enjoyed reading your article and I will be including it in the education that I offer women who test positive. That said, I still do not like giving antibiotics as the solution to this problem. I start educating woman before they are pregnant or early in their pregnancy in ways to improve their immune systems, to eat better, to add probiotics and live foods to their diet, etc. in an effort to test negative for GBS at 36 weeks.

If she decides to take antibiotics, then I highly recommend that the mother and her baby take probiotics after delivery.
For baby: http://www.jarrow.com/product/201/Baby's_Jarro-Dophilus
For mother: http://www.jarrow.com/product/201/Baby's_Jarro-Dophilus
I also recommend that she eats lots of probiotics, yogurt, kefir, miso soup, kimchee, raw sauerkraut, etc. Most of these things she can make herself.

If she tests positive for GBS and she decides to not treat with antibiotics then we avoid AROM if at all possible and we do no or very few vaginal exams in labor.

Here is something I read somewhere that I liked, "There is no perfect answer. In most cases, a mom who has GBS will also have GBS antibodies that are passed to the baby through the placenta. [ref: Williams Obstetrics] Nature's not stupid. In rare cases of either very high colonization or unhealthy mom or baby, the baby could be overwhelmed and then require antibiotic treatment. However, the treatment carries risks of its own – such as allergic reactions and developing antibiotic resistant strains. Again, nature's not stupid. In addition, of course, receiving antibiotics in labor is one of the dominoes in the cascade of interventions and increases overall risk due to the compounded risks of the cascade. There's no perfect answer. Alternative approaches to reducing colonization may be the most sensible solution."

This is an excellent article written by Christa Novelli who has a master's degree in public health from the University of Northern Colorado and a BA in sociology from the University of California at Berkeley. Christa tested positive for Group B Strep with her second pregnancy and opted not to take IV antibiotics during labor. Tessa was born after 15 hours of natural labor with no interventions and did not develop a GBS infection. http://vahomebirth.com/documents/GBS%20Strep%20B.pdf

I also suggest that you do some reading about the Human Microbiome Project.
http://www.sciencedaily.com/releases/2008/11/081118121941.htm "You clearly get shifts in the structure of the microbial community with antibiotic treatment," says Sogin. "Some bacteria that were in low abundance prior to treatment may become more abundant, and bacteria that were dominant may decrease in abundance. When you get these shifts, they may be persistent. Some individuals may recover quickly, and others won't recover for many months."

In all the individuals tested in this study, the bacterial community recovered and closely resembled its pre-treatment state within four weeks after the antibiotic course ended, but several bacterial taxa failed to recover within six months.

This raises questions about the health effects of perturbations to the human-microbial symbiosis in the gut, such as may occur with antibiotic treatment. Because specific microbial populations mediate many chemical transformations in the gut—and previous studies have related these processes to cancer and obesity, among other conditions—changes in the composition of the gut microbiota could have important, but as yet undiscovered, health effects.

"When you change the microbial population structure in the gut, you may affect how that population is keeping indigenous pathogens at manageable levels," says Sogin. Bacteria that do not normally cause problems may begin to grow more rapidly, and cause disease.
Here are a couple of articles that address the importance of good flora to the immune system of newborn infants and how breastfeeding vs. formula feeding factors in.
http://www.slate.com/blogs/how_babies_work/2013/03/20/the_science_of_breast_milk_latest_research_on_nursing_and_milk_vs_formula.html and http://www.health-e-learning.com/articles/JustOneBottle.pdf

Even National Geographic magazine recently had an article about bacteria with a couple of pie charts that compared the intestinal flora of a vaginally born baby vs. a cesarean born baby. "Small, Small World They're invisible. They're everywhere. And they rule" By Nathan Wolfe. "We get our first dose of these microbial coconspirators as we pass through our mother's vaginal canal, where the bacterial population changes dramatically during pregnancy. For instance, Lactobacillus johnsonii, which normally lives in the gut and helps us digest milk, becomes more abundant in the vagina, exposing the baby to the bacterium, perhaps to help prepare the way for digesting breast milk." The article didn't mention that if the mother was treated with IV antibiotics in labor and her vagina was void of good flora at the time of delivery, then her baby would not receive the very important bacteria that babies need. Nature is designed to work and we have to be careful when we start interfering.
GBS Prophylaxis: What are we Creating? By May Lou Singleton, Midwifery Today 81: 18-20

Probiotics: A Better Way to Treat Infections during Pregnancy by Genevieve Lewis Midwifery Today Autumn 2006
GBS in a Homebirth Setting by Renee Meuse Bishara, Midwifery Today Autumn 2006
I have lots more that I can share, but this is a good start!

sweetPsmomma April 12, 2013

Debrah,
I do agree that nature is smart and a wonderful thing. However, I find your comments about antibiotics not being a good solution to the problem and instead offering your patients to eat more probiotics and make healthier lifestyle choices offensive. While you may not agree with antibiotics as a solution for me they are and were THE solution. I am a healthy 27 year old woman who tested negative for Group B and who gave birth to my seemingly healthy full term baby who contracted GBS and bacterial meningitis within 24 hours of life. (You can read more on my story in an earlier comment.) Your comments suggest that if I had only ate more yogurt or perhaps made healthier meal choices or excerised a little more then maybe my daughter wouldn't have contracted GBS and nearly died. I do not believe this to be true and find it hurtful. It was God's will for my daughter to contract this disease just as it was for Him to save her from it. I was much more a naturalist before this birth (it's my second), but now I am a full supporter of antibiotics because without them my daughter would be dead. The truth is that we can research, eat different things, try homeopathic preventions, go to every OBGYN appointment, but no women can ever predict the birth of her child. Even if everything goes perfectly in her prenatal appointments and her delivery- 15 hours later her baby could be on its death bed just like mine was… no matter how much yogurt you eat.

22. 

Ann April 12, 2013

Thanks for the great article! This is very timely for me; I just took my GBS test yesterday and I'm waiting to find out the results. I was GBS positive with my first two children and am hoping that I'm negative this time around. I know the antibiotics I had with my first two caused us all gut issues, which we've been working on correcting since. It's hard because I'm sure there isn't much research on gut flora, but I know it was a real thing for us.

I would also be interested to know what other factors the babies who did/didn't have EOGBS had in common. I would be curious to know if it's linked to the mom's vitamin D levels, since that affects the immune system, although there probably aren't any studies on this.

23. 

Dr. Heather Rupe April 13, 2013

Thanks for taking the time to write such a thorough, easy to understand article. Great works!

24. 

Ashley April 17, 2013

I personally am waiting to see information about the long-term risks of intra-patrum use of antibiotics. With my son I tested positive and chose to do the antibiotics. He has had gut issues since birth, which are now very severe. I am seeing a huge upsurge of other babies having to be on drugs long-term or even for life due to intestinal issues– all of whom were either born via cs or had antibiotics during labor. Although probiotics may help some of these, the lack of diversity and early colonization of non-gut bacteria is very difficult to over come from the recent studies I have been seeing. I know there was a recent study released from one of the scandinavian countries which addressed this issue.

I am now pregnant and facing the issue once again. I had previously believed that the gut-flora issue wasn't as severe of an issue that many had made it out to be or could be corrected with probiotics. However, after having such difficulty with my son which has almost led to hospitalization and still may, my perception of the risk/reward ratio has significantly shifted.

Ann April 22, 2013

This is similar to my situation, although my two children's gut issues have not been very severe, just there. Just curious, did you try probiotics after your son was born to repopulate his gut or have you just read that it's not effective?

Having tested positive with my third pregnancy and due in two weeks, I'm really struggling with this decision. I know antibiotics are not without (potentially serious) side effects, but I'm also not sure I'm comfortable with the risk of EOGBS disease, even though it's pretty

small. I just wish there was more research on why that one baby in 200 with positive mothers gets sick and the other 199 do not.

25. 

Doula Dani April 19, 2013

Great article! Thank you!

26. 

Lydia91 April 22, 2013

I am curious whether you are going to get around to debunking the various practices that are rife within the natural childbirth and midwifery community including the use of castor oil, evening primrose oil, moxibustion, etc., etc.?

- 

  Rebecca April 22, 2013

  Hi Lydia, I find your question interesting. Not because of the topics you propose, but the manner you phrased your question. I'd like to remind you that one of my core values at Evidence Based Birth is respect. Please keep your comments respectful. Tone is difficult to read over the internet, but I gather from your tone that you think the "natural childbirth and midwifery community" (whatever and however you define it) is a bunch of people who don't know what they are doing. I think that every field has its own practices that may be based more on superstition and tradition than actual research evidence– sometimes there is clinical knowledge that is evolved over time that has not yet been studied, other times it has been only minimally studied, other times it has been studied and found to be harmful but people continue to do it anyways. These kinds of situations are not found in only one group or "community" as you call it, but in all different fields of healthcare. As for your 3 specific topics, if you are curious you can find information about castor oil and moxibustion on http://www.summaries.cochrane.org. There is actually some evidence (although minimal) to support moxibustion in combination with accupuncture for turning a breech baby. If it is not harmful, then why not give it a try? Castor oil does not have enough evidence to recommend its use at this time, but it does cause nausea. I have already talked about evening primrose oil in a previous article– you can search for it on my website. I would like to add that many people in the mainstream medical community use these 3 alternative therapies– not just people in the "natural childbirth community" that you are (perhaps condescendingly?) referring to. Again, please remember to keep your comments respectful of differing opinions, and centered on the evidence. That is what we are all here for– to talk about the evidence. Not to degrade or denigrate other groups or people.

27. 

Marti Perhach April 22, 2013

Very well-wrtten and researched article! Could you include mention of a third type of GBS disease? The term "prenatal-onset GBS disease" was recognized by the CDC on page 23 of the MMWR, November 19, 2010/Vol.59/No. RR-10, "Prevention of Perinatal Group B Streptococcal Disease, Revised Guidelines from CDC, 2010 to included stillbirths and miscarriages caused by GBS. Pregnancy is a distinct time when babies can become infected by group B strep and, although per the CDC no effective prevention tools have been identified, pregnant women should be aware of several evidence-based strategies to help reduce the risk of their baby becoming infected prior to labor and delivery.
1) See their provider promptly for any vaginitis symptoms which may be caused by group B strep and indicate heavy colonization
2) Ask to have a urine culture for GBS and other bacteria done at their first prenatal visit. If a significant level of GBS is found in ther urine, oral antibiotics should be described at time of diagnosis as GBS in the urine means that they may be heavily colonized which puts the baby at greater risk.
3) Use caution regarding invasive procedures such as membrane stripping, etc. which may move bacteria closer to the baby. GBS can cross intact membranes.

Please see this page http://www.groupbstrepinternational.org/what-is-group-b-strep/prenatal-onset-3/ for additional info on prenatal-onset group B strep and reasons why membrane stripping should be avoided.

Marti Perhach
Mother of Rose, stillborn due to GBS
Group B Strep International Cofounder

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