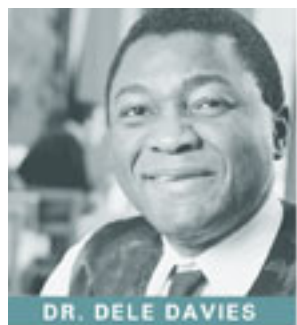


What you don't know can hurt your newborn



Of all the worries that can consume expectant parents, Group B streptococcal (GBS) disease is not likely to even be on the list.

It's a name that many parents will never hear. But some do ... usually within hours of birth, when their newborn child becomes critically ill. They're often shocked to learn that Group B strep is a leading cause of serious infection in newborns.

“It's absolutely devastating to carry a healthy baby through pregnancy and then have the little one become very, very sick within a few hours of birth and, in some cases, die,” says Dr. Dele Davies, a Heritage researcher at the University of Calgary. “Group B strep is a very serious health issue.”

Dr. Davies has become the research champion of GBS prevention in Alberta. His work on screening, laboratory testing methods, treatment guidelines, and risk factors has earned him a reputation as a world expert on GBS. Recently, he has begun to collaborate on the development of a vaccine.

“Over the last few years, my work on Strep B has begun to come together,” he says. “We have a lot more knowledge about the disease, doctors in Alberta are fairly well aware of risk factors and treatment, and families are beginning to learn about GBS. I think developing a vaccine is the next logical step.”

A GBS primer

Group B strep is a fairly common type of bacteria. It is not the same as Group A strep, which causes strep throat. GBS is found in many healthy

adults, including 15–40% of healthy adult women. In a recent study of 1200 pregnant women in Alberta, Dr. Davies found the infection rate to be 19%.

Newborns contract GBS during labour and delivery, when they come into direct contact with the bacteria carried by their mother in the vagina or lower intestine. Fortunately, most babies who contract GBS from their mother do not get sick. However, 1–3% of women infected will have babies who get the disease. The infants can develop blood, respiratory, and other devastating infections. As many as 10% of infected babies die from GBS disease, and as many as 20% are left permanently handicapped.

Group B strep is tricky, because a person who carries GBS is not sick and shows no symptoms. Consequently, screening is vital.

“Since there are no clinical signs of GBS, you can't tell who is a GBS carrier by taking a history or doing a physical exam,” explains Dr. Davies. “You need to actually culture the bacteria from a clinical sample.”

Knowing the result before going into labour can protect a baby's life. Alberta doctors routinely screen pregnant women for GBS at 36 weeks. If the test is positive, the recommendation is to give the mother antibiotics such as penicillin during labour. This will effectively prevent most GBS infection in newborns.

Understanding why some babies develop GBS disease while others do not was one of the objectives of a recently completed study by Dr. Davies' research group. More than 500 women in Alberta were enrolled in the study, which identified such key risk factors as prolonged rupture of membranes, fever during pregnancy, premature delivery, prior delivery of an infant with GBS disease, and quality of care during pregnancy.

“What we see from these data is that GBS disease is multifactorial and highly complex,” says Dr. Davies.

“Antibiotics are a short-term solution. Eventually we will run into problems with resistance. I'm convinced that vaccination is the best long-term solution because it will eradicate this serious threat to children's

health.”

Developing a vaccine

The conventional approach to developing a vaccine that protects against this type of bacteria is to base the vaccine on sugar molecules called polysaccharides. Adding a protein to the polysaccharide molecule enhances the production of antibodies needed to combat the disorder. This is called a conjugate vaccine. The HiB (Haemophilus influenzae type B) vaccine is an example of a conjugate vaccine.

But HiB has only one strain (the technical name is serotype); Strep B has at least eight. “You’d have to conjugate each one, and that would make the vaccine very expensive,” notes Dr. Davies. “An alternative approach is to develop a protein vaccine. That’s the route we’ve chosen.”

Dr. Davies is collaborating with Dr. Bernard Brodeur’s research team from Université Laval. They have identified a protein common to all serotypes of Group B strep, which could become the basis of a protein vaccine.

While the Québec group works on vaccine development, Dr. Davies and his team are using clinical studies to gain more information about GBS itself, and are getting important background information on the potential effectiveness of the new protein as a vaccine. They have found that of the eight GBS serotypes, three are common in Alberta. As well, some strains are more virulent than others, and women tend not to have antibodies against these virulent strains.

“There’s much work to be done before we even have a vaccine to test. The research is only in the very early stages,” notes Dr. Davies. “And even if we do develop the perfect vaccine, there will still be questions to answer about the best time to give the vaccine, and whether it could be given to pregnant women.

“Nonetheless, my eyes are fixed on prevention. I get excited about the possibility of never seeing another newborn infected with Strep B. That

would be something to celebrate.”

Dr. Davies is a Heritage Health Scholar, a University of Calgary Associate Professor, and Director of the Child Health Research Unit at the Alberta Children's Hospital. He also receives funding from the Canadian Institutes of Health Research, formerly the Medical Research Council of Canada, the National Health Research and Development Program, and the Alberta Children's Hospital Foundation.