

The Development of a Group B Streptococcus Prevention Policy at a Community Hospital

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BACKGROUND AND OBJECTIVES:

In 1996, the Centers for Disease Control (CDC) issued guidelines for antepartum antibiotic prophylaxis of group B streptococcal (GBS)-positive women. The objective of this study is to document results of a GBS prophylaxis policy at one nonacademically affiliated, community hospital and discern its effectiveness with regard to compliance as well as in decreasing the incidence of early onset GBS (EOGBS) disease.

METHODS:

The development of a GBS-prevention policy at the Women's Hospital of Greensboro (WHG) was documented by means of interviews and examination of minutes of meetings. Effectiveness of the policy was assessed by calculating the percentage of all GBS+ or unknown mothers who received antepartum antibiotics during a 1-year period. Additionally, all newborns with any positive GBS culture during the past 13 years at WHG were identified.

RESULTS:

The policy was formulated and distributed during a 6-month period by strong leadership, community "buy-in," and an educational seminar. A preprinted physician order was written so that all GBS-positive/unknown mothers would receive antepartum antibiotics. Additionally, a clinical pathway was used to track and monitor maternal GBS status. During October 1, 1999 to September 30, 2000, 1124 (23.1%) mothers were found to be GBS positive/unknown. Of those who delivered an infant >37 weeks' gestation and who could be linked to the pharmacy database, 777 (91.1%) received antepartum antibiotics. The incidence of EOGBS disease at WHG before 1996 was $1.93 \pm 0.7/1000$ births compared to $0.4 \pm 0.05/1000$ after the issuance of the guidelines ($p=0.002$, t -test).

CONCLUSIONS:

Over 90% of GBS-positive mothers were treated with antibiotics at WHG. Associated with this high adherence rate to the CDC guidelines has been a

five-fold decrease in the incidence of EOGBS disease. We attribute these results to the implementation of a preprinted physician order sheet to direct intrapartum antibiotics for women with GBS positive or unknown colonization and the use of a clinical pathway to track GBS colonization status.

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BACKGROUND

In 1996 the Centers for Disease Control (CDC) issued guidelines for the prevention of neonatal group B streptococcal (GBS) disease. These guidelines included identification of pregnant women who were colonized with GBS and treatment of these women with antibiotics before delivery.¹ In 2000, the CDC published surveillance data showing a 65% decline in the incidence of early onset GBS (EOGBS) since the dissemination of the guidelines.² A related eight-state survey found that formal GBS-prevention policies were reported in 63% of the hospitals.³

The effective development and implementation of a GBS-prevention policy within a hospital and its surrounding community is not easy. The simple presence of a policy does not ensure compliance during management of individual patients.⁴ With this concern in mind, the CDC among others has called for studies that link policy development with community compliance in the context of an overall decrease in GBS disease.^{3,4}

This study documents the experience of a nonacademically affiliated, community hospital in Greensboro, North Carolina with regard to its successful development and implementation of a GBS prevention policy.

METHODS

Women's Hospital of Greensboro (WHG) serves a multicounty, combined rural and urban area with estimated population of 700,000 and has over 5000 deliveries per year.

To ascertain the history behind WHG's GBS prevention policy, records from the relevant Obstetrical Service meetings were obtained and reviewed. In addition, key policy-making healthcare and administrative personnel were interviewed.

The effectiveness of the policy was evaluated in two ways. First, we obtained data from the WHG newborn clinical pathway developed in

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Table 1 Identification and Treatment of GBS-Positive/Unknown Mothers (Oct 1, 1999–Sept 30, 2000)

Category	<i>n</i>	% of above	% total
Total births at WHOG	5300	N/A	100
Clinical pathways scanned in and readable	4856	91.6	91.6
Mothers who were GBS + /unknown	1124	23.1	21.2
Mothers who were GBS + /unknown with full-term infants	1023	21.1	19.3
GBS + /unknown mothers with full-term infants who could be linked to pharmacy database	853	83.4	16.1
GBS + /unknown mothers with full-term infants who could be linked to the pharmacy database and who received antibiotics	777	91.1	14.7

1998 that included information on the GBS status of each mother. Our time period of analysis was from October 1, 1999 to September 30, 2000. From the individual clinical pathways, we identified all infants, 37 weeks' gestation or greater, who were born to mothers GBS positive or GBS unknown. This subset was then linked, by medical record number and mother's name, to a pharmacy database to discern who received intrapartum antibiotics. Multiple births were included in our analysis.

Secondly, we searched the Moses Cone Health System's microbiology database to identify all newborns with any positive GBS culture during the past 13 years at WHG. We calculated the incidence of EOGBS disease by dividing the annual number of infants who were >37 weeks' gestation with the number who had EOGBS disease.

The study was approved by the Moses Cone Health System Institutional Review Board.

RESULTS

Development of the GBS Prevention Guidelines

In June of 1996, in response to publication of the ACOG/AAP joint committee opinion,¹ a leading physician in the Greensboro obstetrical community suggested that a local policy be developed for

the prevention of EOGBS. Through the obstetrical peer review committee, and later at full service staff meeting, copies of the CDC Guidelines were distributed for review and discussion. Over a period of 6 months these discussions led to acceptance by the full obstetrical staff, and subsequently the full medical staff, of a GBS prevention policy based on the CDC guidelines. In response to the acceptance of the guidelines, two important actions took place. First, a preprinted physician order was created such that any mother whose GBS status was either positive or unknown received antepartum antibiotics. If possible, antibiotics were given at least 4 hours before delivery. Second, in January of 1997, an educational program was presented to the entire obstetrical community concerning the importance of the guidelines and the proper implementation of the new policy. By February 1997, implementation of the new policy began. True monitoring of compliance to the guidelines did not occur until late 1998 when an electronically scannable newborn clinical pathway was developed that included documentation of GBS status for each mother.

Effectiveness of Policy

From October 1, 1999 to September 30, 2000, 5300 infants were born at WHG. In 444 (8.4%) of these births a clinical pathway was either

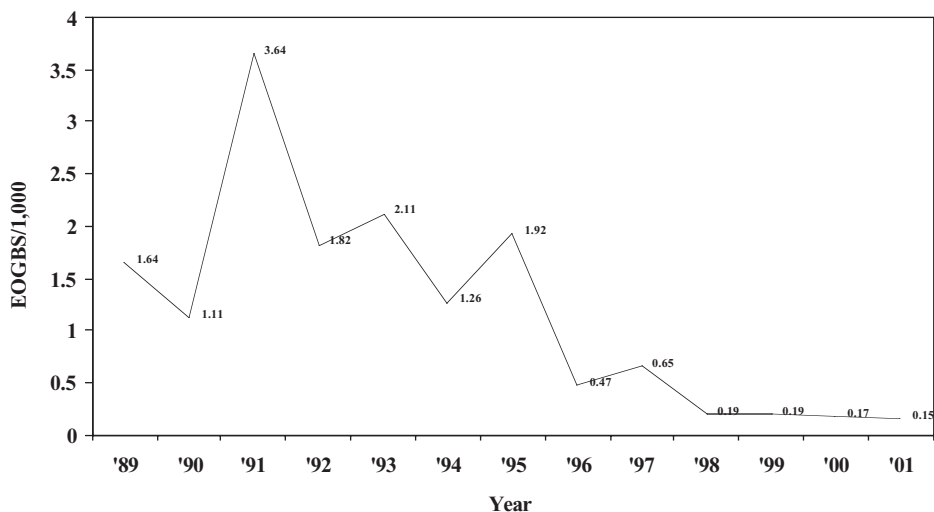


Figure 1. Incidence of EOGBS disease from 1989 to 2001 at the Women's Hospital of Greensboro.

missing or unreadable leaving 4856 (91.6%) individual clinical pathways accessible for our analysis (Table 1). Maternal GBS status was positive in 881 (18%) of the clinical pathways and unknown in 243 (5%). Of the 1124 pathways that were either GBS positive or unknown, 1023 (91%) occurred where mothers subsequently delivered an infant >37 weeks' gestation.

When clinical pathways and pharmacy database were linked, problems with identification and/or matching of medical record number occurred in 170, allowing 853 (83.4%) to be analyzed. Of these, 777 (91.1%) received antepartum antibiotics.

Figure 1 shows the incidence of EOGBS disease at WHG from 1989 to 2001. The incidence decreased from an average of $1.93 \pm 0.7/1000$ births prior 1996 to $0.4 \pm 0.05/1000$ after 1996 ($p = 0.002$, t -test).

DISCUSSION

Based on our results, over 90% of mothers at WHG who were colonized with GBS or whose GBS status was unknown received intrapartum antibiotic prophylaxis. Additionally, since the adoption of the CDC guidelines at WHG, the incidence of culture proven EOGBS disease declined at WHG from 1 to 2/1000 before 1996 to less than 0.5/1000 after 1996. These incidence rates are similar to national figures.⁵

Although implementation of GBS prophylaxis programs have been previously reported at other institutions,^{6–8} to our knowledge this is the first report of such a program being instituted in a nonacademically affiliated, community hospital. The issues and challenges that face a community hospital are quite different than those at an academic center. Programmatic implementation and outcomes are likely not comparable between the two. Whereas guideline development and promulgation may occur first at academic centers, the measure of true success may be how well a guideline is adopted at the local, community level.

The success of our program hinged on a number of factors. First, the policy was developed with the input and “buy-in” of the entire community. A strong and respected physician leader served as the catalyst. Presentation of the CDC guidelines as well as a formal educational seminar followed. Second, a preprinted order for antibiotic treatment of all qualifying women was created. Previous studies have shown that preprinted orders increase compliance rates of interventions such as pneumococcal and influenza vaccine to the institutionalized elderly,^{9,10} or screening programs such as evaluating the frequency of hepatitis B surface antigen in pregnant women.¹¹ Third, placement of the patient's GBS status on an electronically scannable clinical pathway allowed excellent quality control of GBS status collection.

This study has some limitations. First, because this study includes no comparison group, we cannot be absolutely confident that other factors, in addition to the GBS prevention policy, were the cause of the high identification rate and treatment of GBS-positive

mothers. Similarly, factors other than GBS prophylaxis may be contributing to the decrease in EOGBS disease over the past decade. Finally, as discussed above, generalizing our policy implementation and results to other nonsimilar community hospitals may not be appropriate.

In conclusion, over 90% of GBS-positive mothers were treated with antibiotics at WHG. Associated with this high adherence rate to the CDC guidelines has been a 5- to 10-fold decrease in the incidence of EOGBS disease. We attribute these findings to the use of a clinical pathway to ensure knowledge of GBS status and a preprinted physician order to ensure proper treatment. This study illustrates that strong community leadership and well-designed policies can result in development of and compliance with a GBS prevention program in a nonacademically affiliated community hospital. We suggest that other maternity facilities consider similar policies to maximize guideline compliance.

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