RESULTS: Neonatal EOD

Evolution of notifications to the BSNet
Between 1991 and 2005, 669 cases of EOD were reported.
Each year, a mean of 27 laboratories (16-35) notified a number of cases fluctuating from 24 to 104 with an average of 51 cases (IQR: 11).

Distribution of pathogens
All GBS, E.coli and S.aureus were considered as the cause of 5.9% of the cases, and 7.2% of the total cases of neonatal EOD were reporting GBS.

The reported GBS-negative bacilli (GBN) other than E.coli represented only 4.3% of the cases.

Other neonatal pathogens as group A streptococci (GAS), Streptococcus pneumoniae, Neisseria meningitidis and Listeria monocytogenes accounted respectively each for less than 3% of EOD.

DISCUSSION AND CONCLUSION

In Belgium, since the 1980s, group B streptococci (GBS) early onset (EO) sepsis is still an important cause of morbidity and mortality among newborns. After the release of CDC guidelines for the prevention of GBS perinatal disease in 1996, provider hospitals (not all) have implemented the recommended intrapartum chemoprophylaxis. Their practice was not in agreement with CDC guidelines and was less effective.

In 1998-1999, two maternal surveys covering the whole country performed to assess the Belgian GBS practices for prevention of GBS perinatal disease, demonstrated room for improvement! In 2000, several fall-back symposia related to the surveys and highlighting the major expected improvements were organized by different professional societies. In 2001, a consensus meeting was held and in 2003 the recommendations were issued by the Superior Health Council.

The result of these recommendations is an increasing use of antibiotics during labor to decrease the risk of GBS perinatal infection. Therefore, there is concern that one unintended consequence of GBS prevention efforts might be a change in the spectrum of organsims involved in neonatal EOD, and particularly the risk of an increase in the rate of serious neonatal infections caused by Gram negative Bacilli (GBN).

REFERENCES

P Melin et al. Pediatrie and Infectious Diseases 2005

Fig. 1: Pre-identification, one lab reports the percentage of cases of EOD in one year from 1991 to 2005 (right).

RESULTS: GBS EOD and LOD

Evolution
Through 1999 to 2005, 230 strains of GBS isolated from neonatal EOD or LOD were sent to the NLR Lab with a mean of 33 cases per year (23-50).

Table 2: Annual distribution of GBS isolates from 230 neonates with EOD or LOD through 1999-2005 and referred to the NLR Lab

<table>
<thead>
<tr>
<th>Year</th>
<th>EOD</th>
<th>LOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>27</td>
<td>5</td>
</tr>
<tr>
<td>2000</td>
<td>56</td>
<td>3</td>
</tr>
<tr>
<td>2001</td>
<td>86</td>
<td>4</td>
</tr>
<tr>
<td>2002</td>
<td>132</td>
<td>12</td>
</tr>
<tr>
<td>2003</td>
<td>100</td>
<td>18</td>
</tr>
</tbody>
</table>

Cases of GBS LOD has remained stable through 1999-2005 but a significant decline in cases of EOD has been observed since 2001. It is well illustrated by the evolution of the annual balance between the numbers of EOD and LOD (fig.2).

Fig. 2: Annual balance of cases of GBS EOD and LOD compared to cases of LOD, 1999 to 2005

DISCUSSION AND CONCLUSION

This retrospective analysis gives probably a good overview of the Belgian distribution of pathogens causing neonatal EOD, but it has some important limitations: as the lack of information regarding the annual number of births, or as the knowledge regarding prevention or antibiotic policies in the different centers. Furthermore we ignore of all sentinel laboratories declared regularly all their cases. This emphasizes the need to improve the kind of data to collect through the surveillance network.

Through the period covered by the surveillance, GBS has remained the leading cause of neonatal EOD, despite the significant decline observed since 2001.

The major Belgian events related to this decline in neonatal GBS EOD are the different symposia organized, at the end of 2000 and in 2001, to support the results of the surveys related to GBS prevention policy and to highlight the expected improvements.

By the end of the period, the occurrence of E.coli cases have significantly changed, neither the occurrence of cases caused by other GNB.

An increase in S.aureus EOD occurred in the late 1990s before a return to its base line.

EOD caused by Listeria and M. influenzae have become very scarce.

CNS were more frequently reported. To attribute any significance to these notifications, it would have been meaningful to access some clinical data of any changes in the pediatric management of neonates or of any change in the used blood culture system.

These changes in pathogens causing EOD require confirmation by ongoing improved surveillance as well as the evolution of the number of cases of GBS LOD. (Could not the intrapartum antibiotic prophylaxis delay the onset of neonatal GBS disease?)

ABSTRACT

Background: In the late 1990s, the era of “group B streptococcal (GBS) prevention” was set up. Progressively, prevention strategy has been implemented in the different hospitals. Important steps marked this period as national surveys related to GBS prevention. Belgian consensus meeting and launch of Belgian guidelines for prevention of GBS early neonatal disease (EOD; 0-5 days). One unintended consequence of GBS prevention efforts may be an increase in the rate of neonatal meningitis due to Gram negative bacilli (GBN).

Methods: Year based analysis of records from 2 databases: i) cases of neonatal bacteremia / meningitis notified by sentinel laboratories to the Belgian Surveillance Network (BSNet), also for EOD collected since 1991 and ii) cases of GBS EOD and rate neonatal diseases (LOD). reported to the NLR Lab.

Results: BSNet an annual mean of 31 cases of EOD (24-106) were notified by 27 (16-35) laboratories. Overall GBS remained the leading cause and represented 12.5% of EOD but with a significant decrease (p<0.01). It was followed by E.coli 15.3%, coagulase-negative staphylococci (CNS) 16.4%, S.aureus 9.0%, Listeria spp. 5.0%. Streptococcus 2.7%, K.pneumonia 2.1%, Synechococcus 1.9%, and others. No significant trend was observed in the cases of EOD and other GNB EOD. For CNS, we did not have data to differentiate infections from contaminated.

BSNet: From 1999 to 2005, for an annual mean of 31 cases (23-50), the ratio ‘LOD/EOD’ increased from 0.16 to 0.71. The number of LOD significantly decreased (p<0.01).

Conclusions: 1) Since 1991, GBS has remained the leading cause of neonatal EOD; 2) But as expected with the implementation of a GBS prevention strategy, a significant decrease of GBS EOD has occurred; 3) No significant trend of the annual cases of EOD and other GNB infections was shown.

BACKGROUND

In Belgium, since the 1980s, group B streptococci (GBS) early onset (EO) sepsis is still an important cause of morbidity and mortality among newborns. After the release of CDC guidelines for the prevention of GBS perinatal disease in 1996, provider hospitals (not all) have implemented the recommended intrapartum chemoprophylaxis. Their practice was not in agreement with CDC guidelines and was less effective.

In 1998-1999, two maternal surveys covering the whole country performed to assess the Belgian GBS practices for prevention of GBS perinatal disease, demonstrated room for improvement! In 2000, several fall-back symposia related to the surveys and highlighting the major expected improvements were organized by different professional societies. In 2001, a consensus meeting was held and in 2003 the recommendations were issued by the Superior Health Council.

The result of these recommendations is an increasing use of antibiotics during labor to decrease the risk of GBS perinatal infection. Therefore, there is concern that one unintended consequence of GBS prevention efforts might be a change in the spectrum of organisms involved in neonatal EOD, and particularly the risk of an increase in the rate of serious neonatal infections caused by Gram negative Bacilli (GBN).

OBJECTIVES


To correlate any trend in their distribution with key dates related to strategies for prevention for GBS perinatal disease.

To monitor any change in the occurrence of GBS EOD and LOD in neonates through 1999 to 2005

METHODS

Population data bases
Belgian Surveillance network (BSNet)

To monitor health problems, the Belgian Public Health Institute has developed a voluntary “passive” surveillance network.

Sentinel laboratories report weekly the occurrence of defined infectious diseases including neonatal sepsis and meningitis occurring within 28 days after birth.

Retrospective review of data reported by sentinel laboratories from 1991 to 2005 for EO sepsis and meningitis (except 2003-2004: computerized data not available).

Information regarding clinical data or susceptibility patterns of the pathogen were not available, neither the total number of births per center during the related period.

National reference laboratory for GBS (BRLab)

Any Belgian laboratory is invited to send to the BRLab all their GBS isolated from severe infection (from blood, CSF or any deep normally sterile sites) for further characterization and epidemiological purposes.

Definition

EO Disease (EOD) was defined by a positive culture of blood or cerebrospinal fluid drawn within 5 days after birth and LOD Disease (LOD) for newborns aged 28 days.

Reported case with coagulase negative staphylococci (CNS) are generally considered as contaminents except clinical or other bacteriological data confirmed an infection.