

Full Length Research Paper

Assessing missed opportunities for the prevention of early onset neonatal infection by group B streptococcus

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Abstract

Background: Group B Streptococcus (GBS) is the leading cause of early onset neonatal infection (EONI). In November/2003 our Department established a protocol aimed at preventing this infection, based on the recommendations set forth by the Centers for Disease Control and Prevention in of 2002. **Purpose:** To assess the missed opportunities for prevention of EONI by GBS. **Methods:** Culture proven EONI by GBS cases occurring between 2004 and May/2010 were identified retrospectively. Data concerning risk factors of the infection, intrapartum procedures and clinical outcome of newborns were collected and analyzed. **Results:** There were 15 cases of EONI by GBS over the study period (0.81/1000 live-births), with no deaths recorded. In 10 cases pregnant women were not subject to antenatal screening. Among the 5 women screened, the corresponding result was negative in 3 of them and positive in the other 2 and these 2 women did not made intrapartum antibioprophyllaxis. We could have been prevented 6 cases of EONI. **Conclusio:** Better GBS prevention is required in our department, as increasing the implementation of antenatal screening and improving compliance with the administration of intrapartum antibioprophyllaxis.

Keywords: Group B Streptococcus, *Streptococcus agalactiae*, neonatal infection, prevention, antenatal screening.

INTRODUCTION

Group B Streptococcus (GBS) is the leading cause of early onset neonatal infection (EONI), with an incidence of culture proven infection of 0.5 cases per 1000 live births and a mortality of up to 10% (Heath et al., 2004). According to recent literature, the inclusion of culture negative GBS infection may increase the total disease burden by 2-3 fold (Luck et al., 2003).

A number of countries, including USA and Australia,

introduced EONI GBS prevention guidelines in the 1990s and have successfully reduced infection rates in their populations. In the UK a national policy was introduced in 2003, by the Royal College of Obstetrics and Gynaecology (RCOG), also with good results (Hughes et al., 2003).

In Portugal there are not national guidelines for EONI GBS prevention, but some Obstetric Units have defined a protocol aimed at this prevention. In November 2003 the Department of Gynaecology and Obstetrics of Centro Hospitalar do Tâmega e Sousa (CHTS), Penafiel, has established a protocol aimed at preventing this infection, based on the recommendations set forth by the Centers for Disease Control and Prevention (CDC) in 2002.

According to the guidelines set forth by CDC in 2002, the main risk factors for infection are maternal

Abbreviations

Group B Streptococcus - GBS
Early onset neonatal infection–EONI

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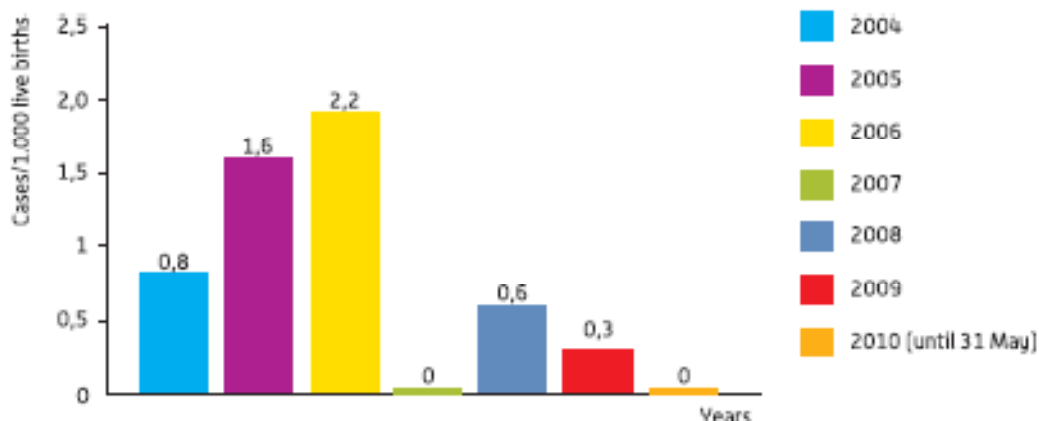


Figure 1. Annual incidence of GBS early onset neonatal infection

Table 1. General characterization of the newborns with GBS early onset neonatal infection

Newly born male	53% [8]
Newly born female	47% [7]
Average weight at birth	3582gr (2235gr-4560gr)
Mean gestational age	40 weeks [39w-41w]

colonization of the vagina and/or rectum with GBS, preterm birth (<37 weeks), intrapartum maternal fever $\geq 38^{\circ}\text{C}$, prolonged rupture of membranes ≥ 18 hours, GBS bacteriuria during the current pregnancy and a history of a previous delivery of an infant who had an early onset neonatal infection by GBS (Gerberding et al., 2002).

This protocol recommends screening of antenatal maternal colonization by GBS between 35 and 37 weeks of pregnancy, to all pregnant women, with exception of those who have GBS bacteriuria in the current pregnancy or a history of a newborn with early onset neonatal infection by GBS. The intrapartum antibioprophyllaxis, administered intravenously, is indicated for all pregnant with a positive screening and for those with an unknown screening at the date of birth and intrapartum risk factors (Gerberding et al., 2002).

The aim of our study was to analyze the cases of early onset neonatal infection by Group B Streptococcus in our department and to identify the corresponding missed opportunities for its prevention.

MATERIALS AND METHODS

A retrospective study of live births with early onset neonatal infection by GBS, born at our institution between 2004 and May/2010, was made. Cases of EONI by GBS

were identified from the neonatal infection database of the Department of Clinical Pathology of our institution and they were defined as blood and/or cerebral spinal fluid positive cultures in the first 6 days of life. The study-specific proforma collected and analyzed data on the incidence and risk factors of the infection, intrapartum procedures and clinical course and outcome of the newborns.

RESULTS

During the study period 15 cases of early onset neonatal infection by GBS were identified from 18.533 births. The overall incidence is 0.81 cases per 1000 live births (Figure 1).

Fifty-three percent of affected infants are male (8 cases); the median birth weight is 3582gr and mean gestational age is 40 weeks (table 1). All infants had a favorable clinical course and there is no death recorded.

In this period there was a progressive increase in the percentage of pregnant where it was made the screening of the colonization by GBS (Figure 2) and a rate of maternal colonization between 11-26% (figure 3). The average of births per year is 2.851.

In figure 4 we present the analysis of the prenatal and intrapartum procedures in the cases of GBS early

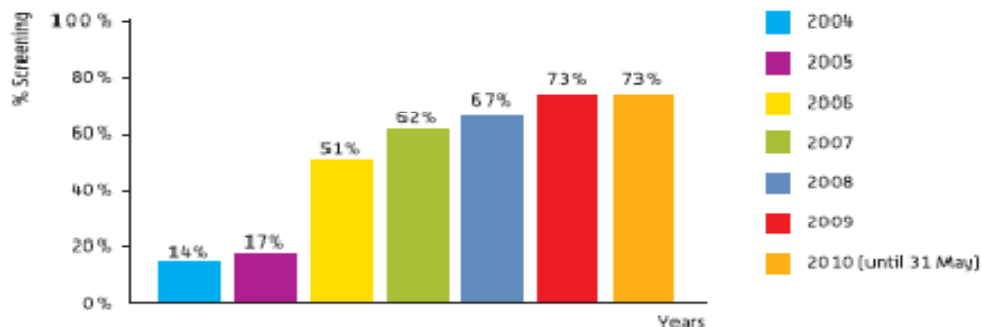


Figure 2. Percentage of annual screening for maternal GBS colonization in our department

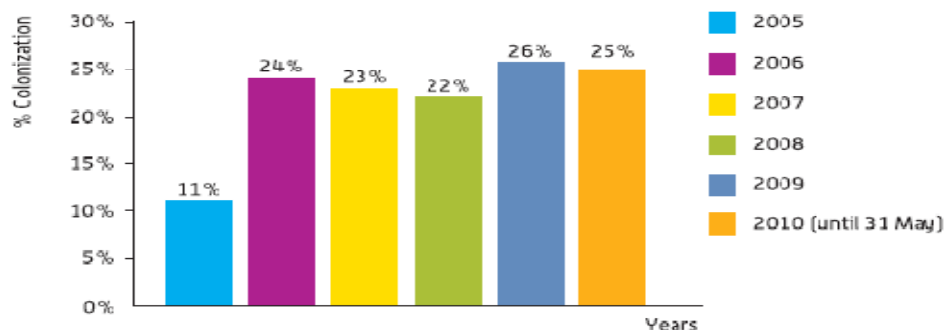


Figure 3. Annual percentage rate of GBS maternal colonization in our department.

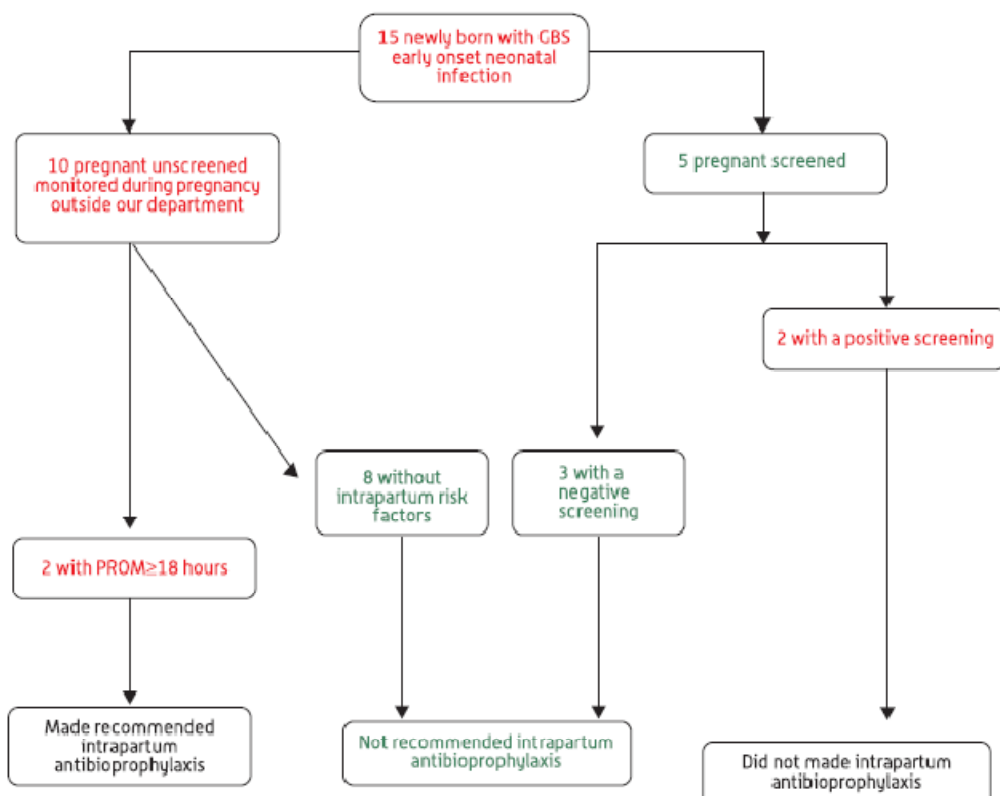


Figure 4. Prenatal and intrapartum procedures in the cases of GBS early onset neonatal infection

onset neonatal infection.

DISCUSSION

Cases of EONI by GBS in our institution, between 2004 and May/2010, were reviewed with regard to opportunities for prevention.

From the analyses of our data, we can conclude that the rate of maternal GBS colonization is similar to that described in the literature and the incidence of EONI by GBS in newborns was a little higher (Heath et al., 2004; Puopolo et al., 2009).

Considering the rate of colonization among our population (40%), if all women had been subject to antenatal screening and if intrapartum antibioprophyllaxis had been carried out as filed, the final result is that we have lost the opportunity to prevent infection in 6 cases. Considering that the effective prevention of infection with intrapartum antibioprophyllaxis, as described in the literature, accounts for 80%, the incidence would have lowered to 0.55 cases per 1.000 live births (Puopolo et al., 2009; Van Dyke et al., 2009).

CONCLUSIONS

We conclude that it is necessary to increase the implementation of antenatal screening and to improve compliance with the protocol of intrapartum antibioprophyllaxis. Antenatal screening of maternal GBS colonization is not, however, 100% effective, because, as described in the literature, in 61.4% of newborns who

develop early onset neonatal infection by GBS, maternal antenatal screening is negative (Puopolo et al., 2009; Van Dyke et al., 2009).

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