

Prevention of group B streptococcal infection in newborns

Recommendation statement from the Canadian Task Force on Preventive Health Care

Recommendations

- There is fair evidence (level II-1 and II-2) that universal screening for group B streptococcal (GBS) colonization at 35 to 37 weeks' gestation followed by selective intrapartum chemoprophylaxis (IPC) given to colonized women who have risk factors reduces incidence of colonization and early-onset infection in neonates. This appears to be the most efficient strategy (grade B recommendation).
- There is fair evidence (level II-2) that universal screening for GBS colonization at 35 to 37 weeks' gestation followed by IPC of all colonized women reduces incidence of colonization in neonates and prevents early-onset neonatal infection, but this level of screening is associated with a much larger proportion of women being treated (grade B recommendation).
- There is insufficient evidence to evaluate the effectiveness of IPC given on the basis of risk factors alone (grade C recommendation).

Two forms of group B streptococcal (GBS) infection—early onset and late onset—are well recognized in infants. The distinctions between them are described in **Table 1**¹⁻⁸. Risk factors for GBS infection in general include preterm labour (<37 weeks' gestation), prolonged rupture of membranes (≥18 hours), maternal fever (temperature ≥38.0°C), GBS bacteriuria during pregnancy, and previous delivery of a newborn with GBS infection regardless of current maternal GBS colonization status. In the absence of intrapartum chemoprophylaxis (IPC), colonization occurs in about 40% to 50% of infants of mothers who have positive results on screening. Intrapartum chemoprophylaxis is effective in reducing incidence of colonization by 80% to 90%. In the absence of treatment, early-onset infection develops in a small but important proportion of infants of colonized mothers.

Preventive strategies

- Universal screening of pregnant women for GBS colonization followed by selective IPC for colonized women with risk factors
- Universal screening of pregnant women for GBS colonization followed by IPC for all colonized women
- Intrapartum chemoprophylaxis given on the basis of risk factors only

Potential benefits

- Prevention of GBS colonization and early-onset infection in neonates

Potential harms

- Increased incidence of GBS strains resistant to erythromycin (reported rates ranging from 3.2% to 16.0%) and clindamycin (reported rates ranging from 2.5% to 15%)⁹⁻¹¹

- Increased incidence of neonatal sepsis due to ampicillin-resistant organisms other than GBS (possibly related to widespread use of antepartum and intrapartum antibiotics)^{12,13}

Evidence and clinical summary

- There is no direct evidence regarding the effectiveness of screening for GBS colonization in pregnant women, as no study to date has compared the outcomes of screened and unscreened women.
- None of the randomized clinical trials evaluating the effectiveness of universal screening for GBS colonization followed by selective IPC for colonized women with risk factors,¹⁴ or of universal screening for GBS colonization followed by IPC for all colonized women,^{15,16} has shown a statistically significant reduction in incidence of early-onset neonatal infection. Although they show a trend toward reduction, none of these studies had enough power to show a significant difference in incidence of early-onset neonatal infection between treatment and control groups (possible type 2 error). There is evidence that both strategies reduce neonatal colonization.
- There is cumulative evidence from cohort studies that either universal screening followed by selective IPC for colonized women with risk factors¹⁷⁻¹⁹ or universal screening followed by IPC for all colonized women^{20,21} is effective in preventing early-onset GBS infection in neonates. The efficacy of IPC for the basis of risk factors alone has not been tested.
- Two to three women need to be treated with IPC to prevent one case of neonatal colonization with either universal or selective IPC strategies. To prevent one case of early-onset neonatal infection, six colonized women with risk factors (95% confidence interval [CI] 4 to 10) need to be treated with selective IPC. In comparison, evidence from two studies indicates that 16 colonized women (95% CI 9 to 84)²⁰ and 2059 colonized women (95% CI 1062 to

Table 1. Description of group B streptococcal (GBS) infection in newborns by age at onset

ONSET	DEFINITION AND SIGNS AT PRESENTATION	INCIDENCE	DEATH RATE(%)
Early	<ul style="list-style-type: none"> Occurs in infants <1 week old Acquired through vertical transmission from colonized mothers Clinical presentations include sepsis, pneumonia, and meningitis^{1,2} 	1-3 per 1000 live births (declines to 0.6 per 1000 live births in active surveillance zones in the United States) ³⁻⁶	4.7 ⁶
		0.42 per 1000 total births in Alberta during 1995-1999 ²	9.0 ²
Late	<ul style="list-style-type: none"> Occurs in infants >1 week old Acquired either by vertical transmission (infection delayed after early colonization in 50% of cases)⁷ or by horizontal transmission (in hospital or in the community)⁸ Meningitis is the most common presentation (85% of cases)¹ 	0.22 per 1000 total births in Alberta during 1995-1999 ²	2.8 ⁷ 2.0 ²

32 968)²¹ need to be treated to prevent one case of early-onset infection if IPC is administered to all colonized women (rates of early-onset infection in control groups were 7% and 0.1%, respectively). (In view of statistically significant heterogeneity [$P = .0062$], results of the two studies were not combined.) Thus, a much larger proportion of pregnant women will receive antibiotics if universal screening for GBS colonization and IPC is adopted as a preventive strategy than if universal screening and selective IPC given on the basis of risk factors is adopted. The point estimates for effectiveness for the different strategies have likely been overestimated because studies are of poor quality, including heterogeneity.

- Collection by swab of antenatal specimens (from lower vagina and rectum) for culture should be done at 35 to 37 weeks' gestation. Specimens should be inoculated into selective broth medium, incubated overnight, and then subcultured onto solid blood agar medium.
- Adequate IPC consists of at least one dose of penicillin (5 million units) intravenously at least 4 hours before birth. If labour continues beyond 4 hours, penicillin (2.5 million units) should be administered every 4 hours until delivery. Intravenous administration of clindamycin (900 mg) or erythromycin (500 mg) every 8 hours until delivery is recommended for women allergic to penicillin.
- With the emerging resistance to erythromycin and clindamycin among GBS strains, currently recommended antibiotic therapy for women allergic to penicillin might need modification. Increased use of antibiotics in the perinatal period could lead to increased incidence of bacteria resistant to antibiotics currently used as initial therapy for suspected perinatal infections.

Recommendations by others

The Society of Obstetricians and Gynaecologists of Canada,²² the United States Centers for Disease Control and Prevention (CDC),²³ and the American Academy of Pediatrics²⁴ have published guidelines on prevention of perinatal GBS infection. They recommend either of two

strategies: universal screening at 35 to 37 weeks' gestation and offering IPC to colonized women or offering IPC on the basis of maternal risk factors. The American College of Obstetricians and Gynecologists²⁵ and the CDC recommend that individual obstetricians choose one of these protocols to establish consistent management of patients. No intervention can prevent all cases of early-onset GBS infection in neonates. ♦

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