Duration of intrapartum prophylaxis for neonatal group B Streptococcal disease: a systematic review
Illuzzi J L, Bracken M B

CRD summary
The authors reviewed the evidence supporting the currently recommended duration of 4 hours’ prophylactic intrapartum antibiotic delivery to prevent neonatal group B Streptococcus (GBS) disease. The review methodology was poorly reported, but the authors correctly identified the lack of research evidence to support current guidelines for the prevention of early-onset GBS disease of the newborn infant.

Authors' objectives
To review the evidence supporting the current Centers for Disease Control and Prevention (CDC) recommended duration of 4 hours’ prophylactic intrapartum antibiotic delivery to prevent neonatal group B Streptococcus (GBS) disease in women testing positive for GBS.

Searching
Searches were carried out in the Cochrane CENTRAL Register (Issue 1, 2006), MEDLINE (1966 to January 2006), EMBASE (1980 to January 2006) and CINAHL (1982 to January 2006), and in relevant protocols and guidelines of the CDC, American Academy of Pediatrics and American College of Obstetrics and Gynecology. The search terms were reported and no language restrictions were imposed. Bibliographies were also screened.

Study selection
Eligible study designs for this review included randomised controlled trials, quasi-randomised trials and observational studies. The included studies comprised prospective cohort and case-control studies. Populations were deemed to be eligible if they included mother-infant dyads where the mother was known to be colonised by GBS, and all included studies met this criteria. Appropriate outcome measures were specified as neonatal GBS colonisation recorded more than 24 hours after delivery; all of the included studies recorded these data but used a variety of different measures. The intervention of interest was intravenous intrapartum antibiotic use, and the included studies delivered ampicillin, erythromycin or clindamycin. Studies had to record the duration of antibiotic treatment before delivery and the extent to which the specified antibiotic was likely to be effective against GBS.

Both authors assessed papers for inclusion, but no further details of the process were reported.

Assessment of study quality
Validity was assessed using criteria from the Methods Work Group of the U.S. Preventive Services Task Force, which examine the internal validity of observational studies. The validity of the included studies was judged to be adequate, uncertain or inadequate for a number of criteria (listed) specific to their study design. The studies were also assessed on their ability to evaluate the association between GBS colonisation and duration of prophylactic intrapartum antibiotics (rated as good, fair or poor).

The authors did not state how the validity assessment was carried out, or by how many reviewers.

Data extraction
The following data were extracted from the included studies where possible; duration of intrapartum prophylaxis, number of GBS colonised mothers and percentage of GBS colonised neonates in the sample. Unadjusted odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for each study using no prophylaxis as a reference. For the case-control study, the OR was adjusted for race, rupture of membranes and maternal fever.

The authors did not state how the data were extracted for the review.
Methods of synthesis
A narrative synthesis was carried out given the heterogeneity in study design and lack of available primary data. The results were grouped by key outcome topics.

Results of the review
Four studies were included in this review: three prospective cohort studies (n=1,156) and one case-control (n=316). One study explicitly addressed duration of the antibiotic intervention; the other three examined efficacy without specifically focusing on duration.

The quality assessment in terms of the study's ability to evaluate the impact of duration on the outcomes was judged to be poor for two studies and fair for two studies in terms of high-risk women. For low-risk women the quality of all four studies was deemed to be poor.

Duration and neonatal GBS colonisation: in the three cohort studies, prophylaxis was associated with a reduced likelihood of colonisation compared with no prophylaxis, but the duration at which this occurred varied from 1 to 2 hours to >4 hours. The case-control study reported prophylaxis of 2 hours or more significantly reduced the likelihood of neonatal GBS sepsis, but prophylaxis of less than 2 hours had no effect. In all studies the majority of patients received no prophylaxis.

Duration and early-onset GBS disease of the newborn: data on this outcome were reported from four studies.

Authors' conclusions
The limited evidence suggests that 1 to 2 hours' intrapartum antibiotic prophylactic treatment of pregnant women who have known risk factors for early-onset GBS disease of a newborn will effectively reduce neonatal GBS colonisation and disease.

CRD commentary
This review examined a clearly defined research question with clear inclusion criteria. The search was thorough but did not address the unpublished literature. A validity assessment was carried out but detailed results were not presented, which makes it difficult for a reader to form judgements. The review highlighted the lack of studies which have directly assessed the review question itself; all of the included studies were observational and, therefore, only able to show associations rather than causal connections. Lack of detail about the validity assessment and data extraction processes make it difficult to judge how likely it is that this review has avoided error and bias at these stages. The narrative synthesis was appropriate given the heterogeneity of the study designs and interventions. Overall, it is unclear how reliable the review methodology is, but it clearly identified the lack of research evidence to support current guidelines for the prevention of early-onset GBS disease of the newborn infant.

Implications of the review for practice and research
Practice: The authors stated that the evidence does not support the current guidelines which recommend a 4-hour minimum of prophylactic intrapartum antibiotic treatment for GBS-positive women. The subsequent testing and separation of infants born to GBS-positive women who have not received the minimum 4 hours' prophylactic treatment may not be justified.

Research: The authors stated that further studies are required to empirically identify the acceptable duration of prophylaxis for low-risk GBS carriers, and to identify infants requiring more intensive surveillance after delivery.

Funding
NICHD, Woman's Reproductive Health Research Scholar award (NIH K12 HD047918).

Bibliographic details
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.