Timing of group B streptococcus screening in pregnancy: a systematic review

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CRD summary
The objective of this review was to determine the best timing for group B streptococcus screening in pregnancy. The conclusion in support of the recommendation to screen at 35 to 37 weeks did not appear to be based on the data presented and should be interpreted cautiously.

Authors' objectives
To determine the best timing for group B streptococcus (GBS) screening in pregnancy to optimise prevention of perinatal GBS infection.

Searching
MEDLINE and EMBASE were searched from 1966 to February 2009. The full search strategy was reported. Bibliographies of included studies were screened for additional articles.

Study selection
Studies that reported the outcome of maternal antenatal and antepartum GBS screening with sufficient data to enable calculation of positive and negative predictive values were eligible for inclusion. Studies were excluded if participants received antibiotics during pregnancy or labour, prior to culture being taken or where it was unclear whether they had done so.

Women in the included studies were cultured for GBS in the antenatal period and during delivery. Sampling sites included vaginal, endocervical, anorectal, urethra, urine, perianal and rectal. Most studies used selective culture media.

Two reviewers independently assessed studies for inclusion. Any disagreements were resolved by consensus.

Assessment of study quality
Two reviewers assessed methodological quality based on eight items: adequate description of population; well-defined point of inclusion in the study; well-defined timing of ante-natal cultures; use of selective medium and chosen culture sites; completeness of follow-up and/or clear description of drop-outs; and reporting of sufficient data to construct a 2x2 table. An overall validity score (zero to 9) was calculated. Studies that scored below 5 were considered to be of poor quality.

Data extraction
Data were extracted to populate 2x2 tables that related GBS screening results to the reference standard (outcome at delivery). Sensitivity and specificity and positive predictive values (PPVs) and negative predictive values (NPVs), with 95% confidence intervals (CIs), were calculated for each data set.

Data were independently extracted by two reviewers.

Methods of synthesis
Studies were summarised narratively and grouped into prospective and retrospective study designs.

Results of the review
Nine studies (n=25,664) were included in the review; 8,898 study participants were cultured for GBS both in the antenatal period and during delivery. Seven studies were prospective and two were retrospective. Study quality scores ranged from 4 to 8.

PPVs for all GBS cultures ranged from 43% to 100% (mean 69%). NPVs ranged from 80% to 100% (mean 94%).
For prospective studies, antenatal GBS cultures were taken at a mean of 30.6 weeks gestational age (range 10 to 40 weeks). Where reported, term delivery occurred in more than 90% of cases. Mean PPV was 63.3% (range 46% to 89%). Mean NPV was 94.2% (87% to 97%), based on seven studies and 13 data sets. When data were divided into results from early cultures (collected before 35 weeks gestational age and term delivery) and late cultures (collected after 35 weeks gestational age and term delivery), mean PPVs were 58.8% and 70.2% and mean NPVs were 93% and 95.2%.

Fourteen data sets were derived from the two retrospective studies. Overall mean PPV was 74.9% (range 43% to 100%) and NPV was 92.9% (range 80% to 100%). Cultures were classified as early or late by the (retrospectively determined) time between antenatal culture and culture during delivery. For early and late culture, mean PPVs were 63.5% and 93.2% and mean NPVs were 90.2% and 97.5%.

Authors’ conclusions
This systematic review confirmed the recommendation to screen pregnant women for GBS at 35 to 37 weeks gestation; the limitations of screening (6% of carriers go undetected) should be noted.

CRD commentary
The article provided a clearly stated research objective. Inclusion criteria for the review were vague and the presentation of the data did not appear to address the stated objective. The search strategy included two bibliographic databases and reference screening. The lack of language and date restrictions decreased the likelihood of biased or incomplete retrieval of relevant studies. Measures were taken throughout the review process to minimise potential for error and/or bias. Methodological quality of included studies was assessed. The use of a narrative synthesis was reasonable; an alternate approach might have been to estimate overall test performance and investigate the impact of timing upon this. The narrative presented did not appear to support the authors conclusion regarding screening at 35 to 37 weeks as this time period was not considered explicitly (data were divided into before and after 35 weeks). This conclusion should be viewed cautiously.

Implications of the review for practice and research
Practice: The authors stated that their systematic review supported existing recommendations to screen for GBS in pregnancy at 35 to 37 weeks.

Research: The authors recommended new well-designed and well-conducted studies to determine the best timing for GBS screening. They further stated that these could be longitudinal prospective cohort studies with cultures taken at different gestational ages. The authors noted that development of an accurate rapid diagnostic test for GBS and a polyvalent GBS vaccine should be high public health priorities.

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