Screening for gestational diabetes mellitus

CRD summary
The authors of this well-conducted review concluded that the limited evidence about early (<24 weeks) gestational diabetes mellitus (GDM) indicates a need for more research. The conclusion, which was based on one recent good-quality study in which screening identified women with mild GDM after 24 weeks' gestation and improved maternal and neonatal outcomes, is likely to be reliable.

Authors' objectives
To evaluate the benefits and harms of screening for gestational diabetes mellitus (GDM).

Searching
MEDLINE, the Cochrane CENTRAL Register, the Cochrane Database of Systematic Reviews, DARE, HTA and the National Institute for Health and Clinical Excellence were searched from 2000 to September 2006. The search terms were reported. In addition, the reference lists from a previous systematic review, relevant articles and reviews were screened and experts contacted. Earlier searches (1966 to 1999) were conducted for reports of screening before 24 weeks' gestation. Only English-language reports were included.

Study selection
Studies that evaluated standard one- or two-step tests for GDM were eligible for inclusion. Studies had to assess one of the following neonatal or maternal outcomes: neonatal mortality, brachial plexus injury, clavicular fracture, maternal mortality, pre-eclampsia, pregnancy-induced hypertension and admission to a neonatal intensive care unit treatment for hypoglycaemia, hyperbilirubinaemia or respiratory distress syndrome. Randomised controlled trials (RCTs) and controlled clinical trials (CCTs) that evaluated the effect of GDM screening or treatment on perinatal morbidity and maternal and perinatal mortality were eligible for inclusion; prospective cohort studies were included if RCTs and CCTs were not identified. For other areas of interest (diagnostic accuracy of screening tests and adverse effects of screening and GDM treatment), RCTs, CCTs and good-quality observational studies were included. Some poor-quality studies were excluded. Comprehensive inclusion and exclusion criteria were reported in the review.

Two reviewers independently selected the studies and resolved any disagreements by consensus.

Assessment of study quality
Two reviewers independently assessed the validity of the studies using the U.S. Preventive Services Task Force study-design specific criteria.

Data extraction
Where possible, the data were extracted with 95% confidence intervals (CIs).

One reviewer extracted the data into standardised tables and a second reviewer checked the extraction.

Methods of synthesis
The evidence was grouped under the five review questions and fair- or good-quality studies were combined in a narrative.

Results of the review
Thirteen studies were included.

The effect of GDM treatment (Question 3) was evaluated in seven RCTs (n=2,797) plus one prospective cohort (n=3,986). Adverse effects of GDM screening (Question 4) were evaluated in two prospective cohort studies (n=309) and one cross-sectional study (n=118). Adverse effects of treatment (Question 5) were evaluated in six RCTs (n=1,845).
and one prospective cohort study (n=301). No evidence was identified for the assessment of efficacy (Question 1) or diagnostic accuracy (Question 2) of screening tests for GDM.

Question 3. Does treatment for GDM reduce perinatal morbidity and mortality for the mother and/or infant?

Diagnosis and treatment versus no treatment after 24 weeks’ gestation: one recent good-quality RCT (1,000 women with mild GDM diagnosed between 24 and 34 weeks’ gestation) reported that treatment (advice about diet, self-monitoring with insulin if required) was associated with a statistically significant reduction in the composite neonatal outcome of any serious perinatal complication (death, shoulder dystocia, bone fracture and nerve palsy) compared with no treatment (adjusted relative risk, RR=0.33, 95% CI: 0.14, 0.75). Treatment also reduced pregnancy-induced hypertension or pre-eclampsia (adjusted RR 0.70, 95% CI: 0.51, 0.95). The study reported no evidence of harm. An earlier fair-quality RCT (in women at high risk of GDM) reported that treatment (10 units insulin per day) reduced macrosomia, but not perinatal deaths, compared with no treatment.

Diagnosis and treatment versus another treatment after 24 weeks’ gestation: two RCTs reported that different types of intensified management (postprandial monitoring and insulin four times daily) were associated with significant reductions in perinatal complications (perinatal morbidity in one study, hyperbilirubinaemia, and macrosomia) compared with less intensive management; there was no evidence of significant maternal hypoglycaemia. The other three RCTs reported no difference between treatments in either glycaemic control achieved or outcomes.

Question 4. What are the adverse effects associated with screening for GDM?

There was limited and mixed evidence about the effects of screening on anxiety and quality of life. No adverse effects of screening on neonates were identified.

Question 5. What are the adverse effects associated with treatment for GDM?

The studies reported no maternal deaths and reports of maternal hypoglycaemia were rare. One RCT reported a significant reduction in postpartum depression amongst treated compared with untreated women. Limited data reported no harms to the foetus. There was no good evidence about potential harms to the neonate that were associated with treatment.

Authors' conclusions
There was limited evidence about early screening for GDM before 24 weeks' gestation; more research is required. One recent good-quality RCT reported that the treatment of women with mild GDM diagnosed by screening after 24 weeks' gestation reduces maternal and neonatal health outcomes.

CRD commentary
The review question was stated clearly. Several relevant sources were searched. Attempts were made to minimise publication bias, but not language bias. Appropriate methods were used to minimise reviewer error and bias during the review process. Study quality was assessed and only good- or fair-quality studies were included in the review. In view of the limitations and diversity of the evidence, a narrative synthesis was appropriate. This was a well-conducted review and the authors’ conclusions are likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated the need for more research to evaluate the harms and benefits of early screening for GDM in the first trimester prior to 24 weeks' gestation. Prospective studies evaluating the prevalence, sensitivity and specificity of current diagnostic tests in relation to the primary outcomes of GDM are also required.

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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.