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Title **Screening for Gestational Diabetes: A Systematic Review and Economic Evaluation**

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Aim

To review current knowledge, clarify research needs, and assist with policy making in the interim, pending future research.

Conclusions and results

Debate continues on the definition of GDM (gestational diabetes millitus). GDM is usually defined by divergence from normal glucose levels. Since glucose levels are usually raised in pregnancy, this may lead to misclassification and unnecessary intervention. Ideally, GDM should be defined by the incidence of adverse effects. However, the most common reported complication of GDM is 'macrosomia' in the baby, usually defined by arbitrary weight cut-offs that fail to distinguish the abnormal growth patterns associated with high insulin levels in the womb.

GDM screening fails to meet certain UK National Screening Committee (NSC) criteria. Several screening tests have been used but some, eg, glycosylated hemoglobin and fructosamine, have proved unsatisfactory and can be discarded. Others, eg, urine testing or random blood glucose, are far from satisfactory, but inexpensive. There is marked international variation. Risk factors, eg, weight, age, and family history are useful in selective screening, but miss some cases of GDM. Fasting plasma glucose (FPG) is convenient and reliable, but some cases would be missed by FPG screening alone. Glucose challenge tests (GCTs) also have shortcomings. Definitive diagnosis is usually by oral glucose tolerance test (OGTT), but glucose load and timing vary in different countries, and reproducibility of the test is poor. More natural methods, eg, test meals, have been used, but not widely.

Recommendations

In some pregnant women, glucose levels rise sufficiently to harm the baby. However, many women with lower levels of glucose intolerance, whose babies are not at risk, may suffer anxiety and inconvenience from being classed as abnormal. Presently, the best test is probably the GCT, preferably combined with FPG. The benefits of followup OGTT are doubtful.

Methods

A literature review focused on screening methods and costs, and an appraisal of screening for GDM against the criteria for assessing screening programs used by the NSC.

Further research/reviews required

1) The 'disease' needs to be better defined by documenting the rate of adverse events in population-based epidemiological surveys (should include ethnic groups, as risks appear to vary). This work would relate outcomes of pregnancy to maternal blood glucose and other factors to determine the glucose level at which outcomes worsened significantly. Data on other factors, eg, overweight, would be used to determine if glucose intolerance was an independent cause, and if so at what level. 2) If the research showed a continuum of risk rather than distinct normal and abnormal groups, economic analysis should examine the cost effectiveness of intervention at different levels. 3) Trials of the marginal costs and benefits of different screening tests (eg, FPG vs GCT, and whether if these are positive a followup OGTT is necessary). 4) Trials of intervention in key groups, eg, those with normal FPG but elevated postprandial levels. 5) Further analysis of the cost effectiveness of screening.

It is recommended to await the results of the two main trials, the Hyperglycaemia and Pregnancy Outcome Study (HAPO) and the ACHOIS trial (a collaborative trial of treatment for screen-detected GDM) before further research is commissioned by the HTA Programme.

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