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A National Survey of Implementation of Guidelines for Gestational Diabetes Mellitus

Abstract:

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Abstract

In 2010, national guidelines for the management of gestational diabetes mellitus (GDM) were published by the Health Service Executive (HSE). In 2012, a questionnaire was distributed to all maternity units to survey implementation of the guidelines. All units screened women for GDM, but used different screening tests with fifteen units (79%) using the recommended 75g OGTT, three units (16%) using a 100g OGTT and one unit (5%) using a 50g glucose challenge test. Optimal outcomes are best achieved through multidisciplinary diabetes-obstetric care and this was available in nine of the units (47%). The prevalence of GDM varied from 2.2-7.4%. Insulin usage varied from 15-56%. Six centres (31%) had not implemented the national guidelines in full because of lack of resources. Despite national endorsement of the guideline, significant variations remain in implementation. This may lead to differences in clinical outcomes depending on where a woman attends for obstetric care.

Introduction

The World Health Organization defines gestational diabetes mellitus (GDM) as any degree of glucose intolerance with onset or first recognition during pregnancy¹. GDM results in increased maternal and neonatal morbidity². Adverse neonatal outcomes include macrosomia, respiratory distress, hypoglycaemia and jaundice. In the long-term, these infants are at risk of obesity throughout their childhood, and premature death from cardiovascular disease in later life². Adverse maternal outcomes include pre-eclampsia, pregnancy-induced hypertension and caesarean section². Women with GDM have an increased lifetime risk of developing type II diabetes mellitus (T2DM) and cardiovascular disease, independent of T2DM³. GDM, in Ireland, complicates up to one in eight pregnancies⁴. There is a lack of consensus about whether screening for GDM should be offered to all women (universal screening) or only to those with risk factors (selective screening), what screening tests should be used, at what gestation, what results should be considered abnormal and, how GDM should be managed during and after pregnancy⁵. The optimal screening regime remains controversial, with conflicting recommendations among various expert groups. Currently the American Diabetes Association (ADA), the United States Preventative Services Task Force (USPTF), the National Institute for Health and Clinical Excellence (NICE) and the 2010 Irish guidelines recommend selective screening based on risk factors⁶⁻¹⁰.

Recent studies, including the landmark Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study, have highlighted the increased clinical risks associated even with mild maternal hyperglycaemia¹¹. The Australasian Carbohydrate Intolerance Study in Pregnant Women (ACHOIS) has shown that screening for and treating mild GDM¹², leads to a reduction in perinatal morbidity⁴. This led to revised international recommendations on screening for GDM^{13,15} including new clinical recommendations by the International Association of Diabetes and Pregnancy Study Groups (IADPSG)¹⁵. These groups recommend screening with a 75g oral glucose tolerance test. Internationally, adoption of the IADPSG criteria has been controversial. Although the ADA endorsed the IADPSG recommended 75g test¹⁶, the American Congress of Obstetricians and Gynecologists recommends a two-step screening process with a 50g glucose challenge test with abnormal results further investigated by a 100g glucose tolerance test¹⁷. The Society of Obstetricians and Gynecologists of Canada also recommends the same two-step screening process¹⁸. These groups contend that the more sensitive 75g test, resulting in a larger number diagnoses will have significant impact on the provision and cost of healthcare services while the benefits of the 75g test over the two-step test have not been proven in a randomised control trial.

In Ireland the Health Services Executive (HSE) has established a number of Clinical Care Programmes to provide clinical leadership in the management of the health services. One of the responsibilities of the Programme in Obstetrics and Gynaecology is the development, dissemination and implementation of national guidelines to improve the quality of healthcare by standardising clinical practices. One of the first tasks of the Programme was to establish multidisciplinary Programme Implementation Boards in all the maternity hospitals with responsibility for the implementation of clinical guidelines. The programme, however, does not manage staffing levels or skill mix in the individual maternity units. In August 2010, the HSE published national guidelines for the management of diabetes in pregnancy which included guidelines on screening and management^{10,19}. These national guidelines were endorsed by the national professional bodies, including the Institute of Obstetricians and Gynaecologists. The purpose of this national audit was to examine the current implementation of guidelines for GDM in all 19 maternity units funded by the HSE.

Methods

The maternity services in the Republic of Ireland are highly centralised. In 2011, 74373 women were delivered in 20 maternity units with the number of women delivered per unit ranging from 1242 to 9458. Four of the units delivered over 8000 women. Of the 20 units in the country, 19 are funded by the HSE. In July 2012 a standardised questionnaire was distributed to all 19 units by the Programme Manager (BL) of the Obstetrics and Gynaecology Clinical Care Programme to audit the implementation of the national guideline.

Results

All nineteen maternity units responded to the questionnaire within four months. All units offered selective screening for GDM with three units involving the general practitioner in performing the OGTT. The OGTT was performed by a phlebotomist in eleven centres and by a midwife in eight centres. Although all units provided some form of screening, this was not always carried out in line with the guideline recommendations. Fifteen units (79%) used a 75g OGTT, three units (16%) used a 100g OGTT and one unit (5%) used a 50g glucose challenge test and if this was abnormal, a 100g OGTT. The OGTT was performed at routinely 24-26 weeks gestation in three units (16%), at 26-28 weeks in ten units (53%) and at 24-28 weeks in four units (21%). The prevalence of GDM was reported by sixteen units and varied from 2.2-7.4% of all pregnant women. Insulin usage was reported from five units and varied from 15-56% of GDM patients.

Only nine units (47%) had a multidisciplinary clinic providing a comprehensive service for women with GDM. One of the 19 units transferred women to another hospital once GDM was diagnosed. All units weighed women at their first antenatal visit. Ten units (53%) provided a dietetic service, but only five units (26%) had a dedicated midwife as part of the GDM care team. All units provided patient information leaflets. Two units (11%) did not have a policy for the treatment of diabetic ketoacidosis and three units (16%) did not have a policy for the management of maternal hypoglycaemia. Two units (11%) did not have a policy for insulin administration around delivery and five units (26%) did not have a policy for insulin administration to cover steroid administration. All units had policies for admission to the neonatal unit and recommended a postnatal OGTT for the mother. Seven of the units (37%) involved the general practitioner in performing the postnatal OGTT.

The number of ultrasound examinations performed routinely in GDM pregnancies varied from one to four. Twelve units (63%) had on site laboratory facilities for HbA1C measurements. Six of the units (32%) have not fully implemented the 2010 national guidelines and cited lack of resources as a barrier. None of the units have the resources to implement universal screening at present.

Discussion

Despite the endorsement of the new national guidelines on GDM by the country's professional body, the Institute of Obstetricians and Gynaecologists, and by the HSE, there remains significant variation in implementation across the

maternity services. While lack of resources is a barrier, incomplete implementation of recommendations may lead to adverse clinical outcomes for the woman and her baby. Failure to screen women adequately for GDM is a lost opportunity to prevent complications for both the baby and the mother. Undiagnosed GDM may result in stillbirth, as well as neonatal complications. There are also long-term complications for the baby throughout childhood, as well as in adult life. Also, an adverse clinical outcome as a consequence of national guidelines not being implemented may result in indirect healthcare costs for the Clinical Indemnity Scheme of the State Claims Agency if a medical negligence claim is made.

In a systematic review and meta-analysis, shoulder dystocia was less common in women treated specifically for GDM¹⁹. The ACHOIS study also⁴ showed a reduction in perinatal morbidity in women with mild GDM who were screened and treated at the appropriate time⁴. The publication of the HAPO study led to a lowering¹⁵ of the threshold of serum glucose levels required for a diagnosis of GDM and the development of the IADPSG criteria¹⁵. These developments, along with improved adherence to criteria for selective screening has led to an increase in the number of women diagnosed with GDM²⁰. Previous reviews have highlighted the international variations in screening for GDM²¹. In addition, there is also international evidence of variations in the use of guidelines within maternity services nationally. In the United Kingdom a survey of 256 maternity hospitals was performed in 1996. Of all units, 84% (n=214) responded and 89% of responding units screened for GDM. For the diagnosis of GDM, 79% used a 75g OGTT, 14% used a 50g OGTT, 9% used a 100g OGTT and 1% used a test meal. Of the 214 units responding, 54% reported a consensus policy about screening while 42% reported that specialists acted independently. Only 58% of units had a written policy on screening for GDM²².

A Swedish study of 822 women reported 31% of women fulfilled at least one criterion for selective screening according to local guidelines, however, only 9.6% of women were screened in practice²³. In a sample of 9,842 women in the west of Ireland offered selective screening for GDM, only 55% accepted and attended for screening²⁴. Distance from the maternity hospital had a negative impact on screening uptake as did socioeconomic status. Thus, variations in patient population further compound variations in hospital practice. The usefulness of selective screening has also been examined through the ATLANTIC DIP (Diabetes In Pregnancy) collaboration by comparing the sensitivity and specificity of known selective screening strategies to a population previously screened by universal screening. When applying NICE guidelines, 54% of women (n=5,500) diagnosed with GDM through universal screening had at least one risk factor for GDM and would have been recommended for selective screening, but 20% had no risk factors and would have gone undiagnosed. When applying Irish guidelines, 58% would have been recommended for selective screening but 16% had no risk factors and would have remained undiagnosed. When applying ADA guidelines, 76% would have been recommended for selective screening but 5% would have remained undiagnosed²⁵.

Using BMI > 29.9 kg/m² as a criterion for screening has a specificity of 81% with a sensitivity of only 48% for the diagnosis of GDM. Reducing screening criteria to include those with a BMI > 24.9 kg/m² increases the sensitivity to 80% but reduces the specificity to 44%. Women with no risk factors who were diagnosed with GDM through universal screening had more adverse pregnancy outcomes than those with a normal OGTT²⁵. Applying universal screening to the Irish population using IADPSG criteria estimates a prevalence of GDM of about 12%. The prevalence of GDM reported from Irish maternity units in this survey varies from 2.2â 7.4% suggesting that 5-10% of pregnant women potentially remain undiagnosed.

In summary, GDM is a common pregnancy complication in Ireland. Guidelines are in place for screening, and treatment is available at a low cost, requiring only advice about diet and exercise in approximately 70% of cases. There is evidence that treatment is effective in reducing perinatal morbidity. It has been argued that the current guidelines are too broad in terms of the criteria used for selective screening, particularly using age over 40 years and BMI over 29.9 kg/m². Cases of GDM are potentially being missed resulting in a lost opportunity to reduce adverse pregnancy outcomes. If such guidelines are also incompletely implemented then we may be increasing adverse clinical events and be missing opportunities where the health of both the woman and her baby can be improved. Although lack of resources is a barrier to implementation, we may need to review our process of care and deliver revised guidelines within finite available resources because maternity units may not be in a position to increase staffing levels given the current financial challenges in the health services.

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