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Reducing the risk of type 2 diabetes mellitus in primary care after gestational diabetes:

a role for mobile technology to improve current care

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INTRODUCTION

Gestational diabetes (GD) is a condition characterised by glucose intolerance, with its onset during pregnancy.[1] Around 5% of women who give birth in England and Wales each year have either pre-existing or gestational diabetes.[1] Women diagnosed with GD are over seven times more likely to develop diabetes mellitus (T2DM) than women with a normoglycaemic pregnancy.[2] T2DM increases the risk of cardiovascular, renal, and retinal disease,[2] and is associated with a reduction in life expectancy of 10 years on average. Although GD is a significant factor for the subsequent development of T2DM, primary care management is sub-optimal.[3] This article therefore explores the management of women diagnosed with GD and discusses how primary care support for these women might be improved.

SCREENING, DIAGNOSIS, AND MANAGEMENT

The National Institute for Health and Care Excellence (NICE) guidelines recommend that pregnant women should have a risk assessment for GD at their booking appointment.[1] Those with any of the following risk factors should be tested for GD: previous GD, BMI above 30 kg/ m^2, previous macrosomic baby weighing ≥4.5 kg, family history of diabetes, or belonging to an ethnic background with a high prevalence of diabetes. The backgrounds with high prevalence are South Asian (specifically women whose country of family origin is India, Pakistan, or Bangladesh), black Caribbean, Middle Eastern (specifically women whose country of family origin is Saudi Arabia, United Arab Emirates, Iraq, Jordan, Syria, Oman, Qatar, Kuwait, Lebanon, or Egypt). In addition, HbA1c should be measured at the booking appointment to determine the level of risk for the pregnancy. NICE also recommends that, if glycosuria of ≥2+ on one occasion or ≥1+ on two or more occasions is observed, further testing for GD should be considered. Testing comprises a 2-hour 75 g oral glucose tolerance test (OGTT) as soon as possible after booking, and at 24–28 weeks if the results of the first OGTT are normal. A diagnosis of GD is made if a woman has either a fasting plasma glucose (FPG) of ≥5.6 mmol/L or a 2-hour plasma glucose level of ≥7.8 mmol/L. Women diagnosed with GD should be referred to a dietician and receive enhanced antenatal care.[1] Postnatally, cessation of blood-glucose-lowering therapy immediately after birth, and a blood glucose test to exclude hyperglycaemia before transfer to community care, are recommended. An FPG test 6–13 weeks postpartum is also recommended for those diagnosed with GD, and an annual HbA1c test should be offered to those who have a negative postnatal test for diabetes. Women with GD should be provided with lifestyle advice on weight control, diet, and exercise, along with an explanation about the future risks of GD and the likelihood of developing T2DM.[1]

GD FOLLOW-UP IN PRIMARY CARE

Although NICE provides clear guidance to support women with GD, there is poor follow-up in primary care, with annual postpartum follow-up rates in England of around 20%.[3] This could in part be attributed to a lack of clarity concerning who is responsible for postnatal testing and poor communication between primary and secondary care.[3] GPs are missing a critical window of opportunity postnatally to complement and continue the work commenced in secondary care. Women previously diagnosed with GD who are at high risk of developing T2DM may also be missed by the assessment process in the UK National Diabetes Prevention Programme (NHS DPP), as risk scores do not necessarily identify a history of GD. Lifestyle interventions that encourage healthy eating and a sustained increase in physical activity reduce the risk of developing T2DM in women with GD. One

study reported a significant reduction in incidence (53%) and another noted a significant reduction in plasma insulin levels (–11.8 versus –3.2 in the control group).[4] The majority of these interventions, however, have been costly, are resource intensive, and are therefore difficult to employ in the primary care setting.[5]

WHAT CAN BE DONE?

Given the health risks posed by T2DM, it is essential that opportunities for early interventions are utilised. Follow-up may be better carried out at the 6-week postpartum check in primary care but there is a need to clarify who is responsible for this role.[4] Suggestions to improve GD follow-up also include establishing a recall register and setting up computer alerts on primary care systems. A routine weight check at the 6-week follow-up should also be considered, as weight loss services and lifestyle advice could be made available where appropriate.

The NHS DPP intervention involves at least 13 education and exercise sessions of 1 to 2 hours over a minimum of 9 months. This may not be best suited to women who have recently given birth and who will have many competing demands on their time. It has been noted that:

'Women in the post-natal period require flexible, longer-term approaches that accommodate their family and work commitments and new information technologies may have the potential to support this.'[5]

Patient and public involvement, and qualitative work conducted by the authors, echo this statement. The authors suggest that a primary-care-based intervention that slots into the appointments these women already attend, complemented with mobile health (mHealth) technology, may be a more cost-effective approach. Such mHealth interventions offer the advantage of being relatively low cost, can be tailored in real time to individual patients, and can collect, analyse, and relay data to researchers.[6] There is growing evidence that apps encouraging self-monitoring of diet and exercise reduce waist circumference, and that electronic pedometers can increase physical activity and diabetes control.[6] One recent systematic review noted that mHealth interventions significantly increase physical activity and reduce adiposity.[7] The use of mHealth could therefore be potentially integrated into a behaviour change intervention based in primary care, to reduce the risk of developing T2DM in women with GD.

CONCLUSION

Women diagnosed with GD have an increased risk of developing T2DM, but primary care provision for these women could be improved. Lifestyle interventions aimed at reducing the risk of developing T2DM in women who have GD should be designed to be accessible, be cost-effective, and take account of women's experience and views of GD. The use of mHealth in primary care is a promising avenue that could help women diagnosed with GD become more engaged with lifestyle interventions and reduce their future risk of T2DM and its sequelae.

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