

Cost effective evidence-based interventions to manage obesity in pregnancy

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care settings, women planning pregnancy should have their body mass index monitored in their medical record and receive nutrition advice, have comorbidities of depression and smoking addressed, receive influenza vaccination and education on gestational weight gain targets. Once pregnant, hospital management should focus on monitoring gestational weight gain to Institute of Medicine targets according to the patient's booking body mass index, combined with screening for diabetes, hypertensive and growth disorders. Following birth, care should be handed back to primary care for ongoing weight interventions.

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Abstract

The rising tide of obesity has seen the prevalence of overweight and obese women presenting for antenatal care approach 50% in recent years. In addition, many pregnant women have gestational weight gain in excess of Institute of Medicine guidelines and develop obesity as a result of pregnancy. Both variables impact adversely upon pregnancy outcome. Individualised programs are not financially viable for cash strapped health systems. This review outlines an evidence-based, public health approach to the management of obesity in pregnancy. The interventions are affordable and in randomised and epidemiological trials, achieve benefits in pregnancy outcome.

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Key words: Obesity; Pregnancy; Randomised trial; Evidence-based

Core tip: Public health approaches are feasible and effective to manage obesity in pregnancy. In primary

INTRODUCTION

The rising tide of obesity has seen the prevalence of overweight and obese women presenting for antenatal care approach 50% in recent years^[1]. Obesity at conception and gestational weight gain (GWG) in excess of Institute of Medicine guidelines both result in postnatal obesity, and each has an independent detrimental impact upon pregnancy outcome.

Obesity is a major risk factor for maternal and fetal complications, including maternal and fetal mortality, miscarriages, gestational diabetes mellitus (GDM), pregnancy-induced hypertensive disorders, infection, thromboembolic disease, obstructive sleep apnoea, fetal growth abnormalities, a need for induction of labour, difficulties with fetal monitoring and anaesthesia, birth trauma, caesarean section, post-partum haemorrhage, stillbirth and postpartum depression^[1-17].

A pregnant woman of "normal" body mass index at

her booking antenatal visit who subsequently gains 20 kg in pregnancy will face similar complications to the mother who presents for antenatal care already obese but subsequently achieves an ideal GWG. Women who are obese at conception and then have excessive GWG experience the highest rate of complications.

In 2009, the Institute of Medicine revised its recommendations for GWG advising that overweight and obese women should restrict gains to 6.8-11.3 kg and 4.9-9.0 kg respectively^[2]. Women of normal body mass index should restrict GWG to 11.5-16.0 kg. Whilst these levels remain subject to debate, and may be further refined as new studies are published, they remain the current goals for care.

The high prevalence of women who are overweight or obese at conception, and of women who have excessive GWG throughout pregnancy, means that every woman presenting for antenatal care is at risk of obesity related complications. Expensive strategies to manage obesity in pregnancy are not logistically or financially feasible given the volume of caseload to manage. Instead, a public health approach is warranted. Universally applied cheaper interventions directed at the entire patient population are likely to have a greater clinical impact than expensive interventions directed at a motivated minority of extremely obese women.

How then, do we manage the obesity in pregnancy, and how do we assist all our antenatal patients achieve ideal GWG without sending our clinical services broke?

PREGNANCY PLANNING IN PRIMARY CARE

The start to this answer lies in primary care

All women attending primary care facilities should have their height, weight and body mass index recorded in their patient record. They should receive feedback on their body mass index at every visit if it is greater than 25, and be informed of the increased pregnancy risks. The primary care provider should encourage each woman to engage with local opportunities for exercise and reinforce good dietary habits.

If a woman is specifically planning pregnancy, then folic acid and iodine supplements should be recommended. Obese women have an increased risk of neural tube defects that cannot be explained by non-use of a supplement alone, resulting in current recommendations that they take a higher dose 5 mg supplement rather than the lower 0.5 mg dose for prophylaxis^[18]. Obese pregnant women also have lower levels of iodine and are at increased risk of iodine deficiency related complications^[19]. Recommendation for supplementation conforms to a public health approach to obesity management in the women planning pregnancy.

An increasing number of reproductive age women have undergone bariatric surgery to manage their weight. Some of these women may still be overweight or obese, but others may have lost weight and be of normal body

mass index. It is important to try and avoid pregnancy within 18 mo of bariatric surgery if possible as several studies have reported an increased risk of fetal growth and nutritional complications^[20,21].

Depression is more common in obese women and is the major risk factor for postnatal depression. Addressing depression prior to conception can help influence the postnatal course and may lead to improved mother to child attachment^[22,23].

Smoking cessation advice should be provided to women who smoke. Alcohol and other drug use should also be addressed. Although benefits are seen if women stop smoking at any stage of pregnancy, the earlier they stop, the greater the benefit.

Finally, influenza vaccination should be recommended. Influenza is more severe in obese pregnant women, but is a significant concern in all pregnancies^[24]. Many women decide against vaccination as they have concerns over safety, and primary care providers need to address these concerns and reassure their patients^[25].

The cost of these primary care interventions is minimal. Women will meet the cost of their recommended supplements and vaccination programs for influenza are already often nationally funded. Other measures should not add more than a few minutes to an existing scheduled consultation.

ANTENATAL CARE AND THE HOSPITAL RESPONSIBILITY

The first component of care is planning at the hospital-booking visit. Women who are excessively obese will need to be referred to centres able to manage their weight. However, the majority of antenatal care may be able to be safely provided closer to home.

It is important that the body mass index is recorded in the notes at booking. This enables maternity care staff to advise women of their Institute of Medicine recommended GWG for their body mass index (BMI) category and set a target for weight gain or restriction.

In reviewing the various meta analyses of randomised trials for interventions in pregnancy for overweight and obese pregnant women, dietary interventions are effective whereas physical exercise and mixed interventions are less so^[26-29]. Furthermore, dietary interventions are cheaper and have greater acceptability to pregnant women.

For example, in the LIP trial, half the eligible women approached to enter the trial declined ($n = 317$). Of the 360 women randomised, a further 56 dropped out. Therefore, one could assume that the group of women completing the trial were a subgroup of motivated obese pregnant women. It was therefore disappointing that so few of this apparently motivated subgroup took advantage of the free exercise interventions offered. Dietary interventions were associated with excellent compliance with 92% of intervention women completing all sessions. In contrast, only 56% of intervention women attended the aerobic classes for at least half of the lessons^[28].

If motivated pregnant obese women will not attend aerobic classes despite free gym membership, physical testing and personal coaching, and given the cost of the intervention to the public health budget, then meaningful changes in health status at a population level are unlikely to be achieved. Of course, this doesn't preclude staff from recommending women seek their own strategies to increase their levels of exercise through walking and making healthy choices in their daily life (*e.g.*, walking up the stairs and not taking a lift).

This swings the public health focus back to dietary interventions. In a recent meta-analysis, four dietary interventions were reviewed^[26,30-33]. Three were effective. The common elements to the effective interventions were that they measured BMI at booking, weighed at each visit, and provided repeated feedback on GWG. The interventions had varying costs. One was expensive and involved ten sessions with qualified dietitians. Whilst effective as an intervention, it is not feasible to implement broadly as a public health strategy. The second effective dietary intervention provided brief feedback at each routinely scheduled antenatal visit on GWG and diet. It also included a session with a clinical psychologist to address psychological factors involved in weight management. However, the most effective strategy was also the cheapest. This involved the simple use of a diary with patient feedback at each visit on GWG.

This strategy can be easily implemented into routine obstetric practice. By placing scales in the clinic and recording weight at each visit into a hand held maternity card, and offering feedback during routinely scheduled consultations, we can imitate the strategy of the effective randomised trial for the minimal cost of some staff education and a set of scales.

The other public health interventions to be implemented in antenatal care are to advise all women to take Folic Acid and Iodine supplements. The role of Vitamin D supplements is less clear although Vitamin D deficiency is more common in obese pregnant women and their offspring and some authorities are now recommending routine supplementation^[17,34].

The increased risk of gestational diabetes warrants routine screening with a full 75 g glucose tolerance test at 28 wk. Some centres also advocate an early test at 20 wk but the cost benefit of such a policy has not yet been fully evaluated^[17]. In accordance with local hospital policies, consideration should also be made for formal anaesthetic review, and for surveillance of fetal growth and hypertensive complications given these risks are increased in obese pregnant women.

POSTNATAL CARE AND LINKING BACK INTO THE COMMUNITY

Following childbirth, overweight and obese women have an increased risk for thromboembolism. If delivery has been by caesarean section, then discussion about thromboprophylaxis is warranted. Some agencies recommend

that all obese women should be offered thromboprophylaxis^[1,17].

Overweight and obese pregnant women face increased difficulties with breastfeeding. This is often due to their large nipple and breast size. Midwifery staff may need to assist mothers with early feeding sessions to ensure correct attachment to avoid nipple trauma.

The final step in management is to ensure adequate transmission of information from the maternity hospital to the primary care provider. This is vital to continue monitoring and encouragement of any dietary strategies adopted in the antenatal period, to promote exercise and monitor for depression and breastfeeding difficulties. It is important that hospitals acknowledge obesity or excessive GWG are complications that impacted upon the pregnancy and note them in the discharge summary to draw attention to their ongoing management in primary care.

CONCLUSION

It is likely that increasing novel and effective strategies to manage obesity in pregnancy will emerge in the next few years. However, it will be important that these new strategies are compared to the current gold standard outlined in this review.

Healthcare is consuming increasing proportions of national expenditure and this situation cannot continue forever. We have to become more effective with the resources we have and implement those strategies with an evidence base we can afford.

Pregnancy is a time of idealization over reality; a time when interventions are accepted and women look to establish life changes. We cannot afford to miss this opportunity for intervention.

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