CHAPTER 1

Importance of good health and nutrition before and during pregnancy

Catherine R. Hankey
Human Nutrition, University of Glasgow, Glasgow, UK

Introduction

Pregnancy is a time of anticipation and excitement, especially for healthy mothers with no known health concerns for their foetus. It is increasingly evident that the lifestyle and health practices of mothers can impact markedly on their own health and that of their foetus.

Historically, pregnancy has been associated with ‘blooming maternal health’ and is probably the only period across the life course when positive encouragement for weight gain is given by many, at least in the developed world. Increasingly, given the worldwide epidemic of obesity, this positive response to sometimes excessive weight gain in pregnancy has been less widely accepted, but it does still have cross-cultural impact. Pregnancy can also offer a positive setting which may increase the willingness of the individual to consider improving their health. It has been envisaged as a ‘new start’, which has been associated with positive improvements in lifestyle. Research has examined whether pregnant women can be encouraged to become more physically active, to attempt smoking cessation and to minimise or avoid alcohol intake. Attempts have been made to alter women’s food choice during pregnancy towards eating more healthy foods such as fruit and vegetables, and away from foods rich in fat and sugar which have often been associated with negative health consequences including the development of gestational diabetes (GDM). Good maternal health both pre-conceptually and during pregnancy has long been recognised as valuable. Evidence is accruing that preparing for pregnancy could offer real health benefits to both maternal and infant health, particularly in the context of the current obesity epidemic. However, this opportunity appears only available to few; for example in the UK, only around 50% of all pregnancies are reported as planned and there were close to 800 000 live births in 2012 [1].

Importance of good maternal health before and during pregnancy

Good maternal health is crucial to reduce the chances of adverse outcomes such as GDM, miscarriage, pre-eclampsia, still birth, macrosomia and caesarean section for the mother, and abnormal birth weight and increased risk of obesity in infancy for the unborn child.
Abstinence from smoking and alcohol consumption together with regular physical activity has long been advocated to pregnant women, given the benefits this can bring for maternal and foetal health. Maternal nutritional status has been recognised as important before and during pregnancy, to maximise the chances of a healthy pregnancy and an optimal outcome for both mother and infant. Historically, dietary advice for optimal health in pregnancy has focussed on healthy eating with an emphasis on the maintenance of good health in terms of dietary intakes, and a sufficient intake of macro- and micro-nutrients [2]. Dietary advice advocated for all adults and appropriate to pregnant women to increase awareness and encourage them to eat well is illustrated in the UK’s visual representation ‘The Eatwell Plate’ [3] (see Chapter 8). This graphic representation, designed for use by all adults, appears to have achieved consensus as a valuable tool, and as well as due to its widespread use in UK National Health Service (NHS), it is advocated by various health charities. However, uncertainties remain as to the scientific evidence on which the tool’s graphic representation is based.

It has recently been highlighted that most pregnant women want to know the best foods to eat and what they should avoid. Current issues of concern include the possible dangers of eating liver, the need to avoid unprocessed cheese and too much tuna and oil-rich fish beyond two portions per week [4, 5].

According to National Institute of Health and Care Excellence (NICE), alcohol, for those in the first 12 weeks of pregnancy, should be avoided completely, and intakes throughout the remainder of pregnancy ought to be very limited, due to potential negative effects on foetal health [6]. Furthermore, as alcohol supplies energy of 7 kcal/g, it is considered as a concentrated source of energy, and hence even moderate consumption may increase energy intakes and encourage excessive prenatal weight gain.

Maternal caffeine intake has received considerable interest, given suggestions that raised intakes increase the likelihood of foetal growth restriction. In a large prospective observational study in two UK maternity units [7], retrospective caffeine intakes were determined and findings indicated that low caffeine intakes (up to 100 mg/day) are safe, but higher levels, in excess of 200 mg/day, increased the risk of miscarriage, premature birth and low birth–weight babies. Two hundred milligram of caffeine equates to around two cups daily of tea and/or coffee, though other rich sources such as caffeinated drinks should also be considered. Decaffeinated versions of these drinks may be of value.

**Link between maternal diet and foetal growth**

Dietary patterns in pregnancy have been studied using factor analyses or similar component analyses to investigate links between maternal diet and foetal growth, and dietary patterns in pregnancy and their associations with socioeconomic status (SES) and lifestyle. This is arguably a clear way to examine diet and health relationships, as the human diet contains a wide variety of nutrients and many may correlate with health outcomes. Danish researchers looked at associations between dietary patterns and foetal growth in over 40 000 pregnant women. Three major dietary patterns were observed: (1) a western diet rich in dairy fat and red and processed meats, (2) a healthy diet rich in fruit, vegetables, poultry and fish and (3) a mixture of both. The health conscious pattern was associated with a 24% lower occurrence of a small for gestational age (SGA) babies [8]. This pattern was evident when parity, maternal smoking, age, height, pre-pregnancy weight and fathers’ height were included as confounding factors.
Using the Avon Longitudinal Study of Parents and Children (ALSPAC) data [9], Northstone et al. examined dietary patterns in the third trimester of pregnancy. Associations were determined between social and demographic characteristics and habitual dietary intake when estimated using a food frequency questionnaire. Dietary patterns were categorised into four broad groups: (1) ‘processed diet’, full of high fat foods, (2) the ‘confectionary diet’, (3) the ‘vegetarian diet’ and (4) the ‘health conscious diet’ where the latter dietary pattern fulfilled the majority of dietary targets and was favoured by educated, older and non-white pregnant mothers.

In contrast, poorer diets were favoured by pregnant women who smoked and were white, young and overweight.

Whilst ALSPAC data indicated the associations between dietary patterns and characteristics of the pregnant women, the Danish study illustrated a positive link between poorer dietary patterns and SGA babies, when the socio-economic and other factors were controlled. This epidemiological evidence favours specific macronutrients or micronutrients that may be underlying the association with SGA.

**Micronutrients most likely to be at risk in pregnancy**

The micronutrients most commonly at risk of shortfalls are iron, vitamin D and folic acid. A recent systematic review confirmed that in the UK and other developed countries, intakes of all these micronutrients are consistently reported to be below national recommendations [10]. The accuracy of these findings has been compromised by the limitations of dietary intake measurements, but a clear trend towards suboptimal intakes is evident. For these reasons, this chapter will deliberately focus on these key micronutrients.

**Iron**

Recent estimates, according to the Nutrition Impact Model Study, of the worldwide prevalence of anaemia in pregnant women is 38% (95% CI 33–43), that is 32 (28–36) million pregnant women globally [11]. Anaemia in pregnancy, diagnosed using World Health Organization (WHO) guidance [12], is defined as a haemoglobin concentration less than 11.0 g/l. Around 50% of anaemia is estimated to be as a result of iron deficiency, the world’s most commonly occurring nutritional disorder. Inadequate iron intakes are known to compromise maternal and foetal well-being, and intervention strategies to manage the situation should be implemented. This usually comes in the form of dietary advice, but more common is iron supplementation.

**Dietary approaches to managing iron status**

Advice given in antenatal clinics should be appropriate with respect to iron status. The UK Scientific Advisory Committee on Nutrition (SACN) has recently summarised its guidance on how to challenge a shortfall in iron status: ‘a healthy balanced diet’, which includes a variety of foods containing iron, will help people achieve adequate iron status [13]. Such an approach is more effective than consuming iron-rich foods at the same time as foods/drinks that enhance iron absorption (e.g. citrus fruit juice, red meat) whilst avoiding foods containing components that inhibit iron absorption (e.g. tea, coffee, milk).
Given the increasing concern that one of the major sources of dietary iron – red and processed meat products – has been linked to the development of colon cancer, the SACN report indicated that intakes of red and processed meat, which they considered high, ≥90 g/day should be reduced by at least 20% to a total intake of 70 g/day cooked weight. The committee considered that reducing red meat intakes by this magnitude would not compromise iron status in those of the adult population with low intakes but could beneficially affect colon cancer risk.

The risk of compromised iron status is increased in pregnancy, given its additional iron requirements. Iron requirements increase across pregnancy, reaching 30 mg/day during the final trimester. In order to help satisfy these increased needs, the proportion of iron which is absorbed in pregnant woman is increased from around 15% of all consumed to up to 45%. Education and counselling regarding diet may improve iron intake and enhance absorption but the degree of change achievable, especially in ‘hard to reach’ individuals, such as those living in deprivation, ethnic minorities, etc. remains in doubt.

**How effective are iron supplements in pregnancy?**
The effectiveness of iron supplements in pregnancy for those with anaemia has recently been evaluated in a systematic review and meta-analysis [14]. This review used international data to summarise the available evidence on the associations of maternal anaemia and prenatal iron use with maternal haematology and adverse pregnancy outcomes. Any relationships between exposure and response were examined such as between dose of iron, duration of use and haemoglobin concentration in the prenatal period, with pregnancy outcomes. Daily prenatal use of iron substantially improved prenatal mean haemoglobin concentrations. The authors concluded that given the worldwide prevalence of anaemia and iron deficiency, they considered it justified to expose an entire population (i.e. all pregnant women) to iron supplementation. As iron deficiency is a preventable disease for which cost-effective treatment is easy to administer, they felt justified in their conclusions. A Cochrane review [15] also concluded that prenatal daily or weekly iron supplementation was effective in reducing the risk of low birth-weight babies and in preventing maternal anaemia and iron deficiency. Iron absorption is physiologically regulated and relies on the natural mechanism regulating total body iron; therefore, it should protect against iron overload. Side effects, and hence poor compliance, can be relieved by administration of the iron supplements with food, although this may decrease absorption, particularly of ferrous preparations.

**Iron supplementation to all ‘healthy’ pregnant women**
In contrast to the views detailed earlier, it has been recommended that routine iron supplementation is unjustified in ‘healthy’ pregnant women [16]. Their argument is twofold. Firstly, the number of hazards associated with iron supplementation, not least that the preparation can be toxic, and oral iron supplements often have gastrointestinal side effects, which are unpleasant. Therefore exposing an entire population to excess iron is unjustified and should not take place without good reason. Secondly, the case for oral iron supplementation should ideally be guided by early or pre-pregnancy ferritin measurements. The view taken by NICE [6] and the British Committee for Standards in Haematology [17] is that iron status in pregnancy ought to be reviewed routinely, and all women should have a full blood count taken at the booking appointment (week 12 of pregnancy) and at 28 weeks [6]. This should facilitate selective iron supplementation early in pregnancy, although effective systems must be in place for rapid review of blood results and appropriate follow-up.
Importance of good health and nutrition before and during pregnancy

In the UK, pregnant women with a haemoglobin level less than 11 g/l up until 12 weeks or less than 10.5 g/l beyond 12 weeks should be offered a trial of therapeutic iron replacement. In non-anaemic women at increased risk of iron depletion, including those with previous anaemia, multiple pregnancy or consecutive pregnancies with less than a year's interval between and vegetarians, a serum ferritin measurement (the best indicator of maternal iron stores) should be considered. If the ferritin level is less than 30 μg/l, then 65 mg elemental iron once a day should be offered [17].

**Vitamin D**

Inadequate vitamin D status is becoming increasingly common in pregnant women. Those with coloured skin, who live in cool climates where sunlight levels are limited and insufficient to allow vitamin D to be synthesised in the skin, are especially vulnerable. Covering of almost all skin, sometimes leaving only the eyes visible as evident in devout religious women leads to poor vitamin D status, especially in a temperate climate such as the UK. The occurrence of infantile rickets is increasing and highlights the need for provision of vitamin D supplements to all those at risk of poor vitamin D status in pregnancy. To meet this goal, 10 μg daily supplementation of vitamin D is advocated throughout pregnancy [6, 18] with a need for clinicians to be especially vigilant towards the vitamin D status of women from black and ethnic minorities, the socially excluded, those with limited exposure to sunlight and the obese (pre-pregnancy body mass index (BMI) >30 kg/m²). The latter group is considered to be susceptible to vitamin D deficiency due to the sequestration of vitamin D into adipose tissue, rather than liver sites, where it then becomes unavailable [19]. Despite the additional requirements of pregnancy, there is insufficient evidence to advocate increasing the daily 10 μg vitamin D supplement level [18].

**Folic acid supplementation to prevent neural tube defects**

In 1991, folic acid supplementation among women planning a pregnancy was shown to prevent a proportion of neural tube defects (NTD) [20] and the evidence was overwhelming; national authorities such as the health departments for England, Wales and Scotland each have a consensus recommendation that all women planning a pregnancy should increase their intake of folic acid. The recommended folic acid intake is about double the current estimated dietary intake of 0.2 mg/day [21], though the mechanism of action is unclear.

As with vitamin D, there have been suggestions that higher levels of folate supplements are required for obese pregnant mother. These larger supplemental doses are required for a number of reasons, for example a higher risk of NTD in the obese; odds ratios for an NTD-affected pregnancy are 1.22 (95% CI 0.99–1.49), 1.70 (95% CI 1.34–2.15) and 3.11 (95% CI 1.75–5.46) for women defined as overweight, obese and severely obese respectively [22]. Folate status is shown to be lower in obese adults than in healthy normal weight adults probably due to a poor quality of diet, and it has been shown that a 0.2 μg dosage of folic acid has a lower impact reflected in lower plasma concentrations in obese adults than in healthy normal weight adult. However, a rate of supplementation guided by BMI may be justified by cogent research findings.
Nevertheless, despite guidance by leading expert committees in the fields of obstetrics and gynaecology [23], the folic acid dosage for the obese remains at 0.2 μg/day rather than at 5 μg/day, as advocated by this guideline.

From a public health perspective, NTD affects only a minority of people at risk, hence, there is a dilemma over the widespread use of folic acid supplementation in flour and other food stuff. USA data report NTD incidence at about 3.5 cases per 10,000 births, a fall from 5 cases prior to the widespread use of prenatal folic acid supplementation. However, given the need for folic acid to be ideally consumed pre-conceptually, and at least up until the first 12 weeks of pregnancy, potentially many women do not comply with supplements. One approach to resolve this issue would be mandatory fortification of flour with folic acid, which currently occurs in over 70 countries worldwide but not in the UK.

Factors associated with poor uptake of folic acid supplements are perhaps predictable and include educating those individuals. An initiative in the north of the Netherlands resulted in 51% women using folic acid supplements appropriately [24]. The socio-demographic and lifestyle factors associated with non-compliance with pre-conceptual use of folic acid included non-western ethnicity, and not having a partner. Fortification of staple foods with folic acid would provide a more effective means of ensuring an adequate intake, especially for those groups of women who are unlikely to plan their pregnancies or to receive and respond to health promotion messages.

The SACN committee [25] believes that sufficient evidence exists to proceed with fortification of flour with folic acid, though the issue still remains under consideration. This is despite some apparent associations between excess folic acid intake and the incidence of colon cancer, although the epidemiological data to date remain inconclusive. However, as with any large public health initiative, consideration of other population groups is required, before implementation. In this case, in order to avoid exposing groups of the population to higher than recommended doses of folic acid, voluntary supplementation of foods with folic acid should be prevented, prior to any country wide fortification.

### Weight gain in pregnancy: what is optimal and how can this weight change be judged?

Given the widespread increase in the prevalence of overweight and obesity, with greater numbers of women affected than men, specific guidelines for optimal weight gain throughout pregnancy are justified. UK data report a doubling of maternal obesity from 7.6 to 15.6% between 1989 and 2007 [26], an observation which has now been replicated across the developed world. The United States (US) Institute of Medicine

<table>
<thead>
<tr>
<th>Pre-pregnancy BMI</th>
<th>BMI (kg/m²) (WHO)</th>
<th>Total weight gain range (lbs)</th>
<th>Rates of weight gain second and third trimester (mean range in lbs/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>28–40</td>
<td>1 (1–1.3)</td>
</tr>
<tr>
<td>Normal weight</td>
<td>18.5–24.9</td>
<td>25–35</td>
<td>1 (0.8–1)</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0–29.9</td>
<td>15–25</td>
<td>0.6 (0.5–0.7)</td>
</tr>
<tr>
<td>Obese (includes all classes)</td>
<td>≥30.0</td>
<td>11–20</td>
<td>0.5 (0.4–0.6)</td>
</tr>
</tbody>
</table>

* Reproduced with permission from Ref. 27. © Nature Publishing Group.
Importance of good health and nutrition before and during pregnancy

(IOM) launched revised guidelines [27], and given a dearth of others, these guidelines appear the most widely recognised and used internationally. The guidelines are based on observational studies, but importantly the weight gain referred to is not just due to increased adipose tissue but also the placenta, foetus and associated tissues. The IOM clearly recognised the need for BMI specific weight gain guidance, and these are increasingly used in clinical practice internationally (Table 1.1).

Why is excessive gestational weight gain a concern in pregnancy?

The presence of obesity and to a lesser extent overweight is the most common obstetric issue in the developed world. There are numerous negative health consequences, more evident in the case of obesity that can affect the health of both mother and foetus. These include GDM and pre-eclampsia in the mother and the risks of babies born large or those SGA. The implications of excessive weight gain are considerable, and in the case of GDM may persist into future generations. Fertility is compromised by raised BMI, and this may reduce the likelihood of future pregnancies in the obese mother [28]. The birthing process itself is also often compromised in the obese, with induction of labour, and high levels of intervention required more frequently than in non-obese women. Recent analyses have indicated that even moderate elevations in maternal BMI were associated with a 20% increased risk of foetal death. It should be noted, however, that this study may indicate a worse-case scenario as the comparator to estimate risk was a BMI of 20 kg/m² [2, 29].

Many consider pregnancy as a period in the life course which favours weight retention post-natally leading to both overweight and obesity. In response, research interest has focused on the development of interventions to challenge this persistent problem, and ideally such interventions should be implemented pre-conceptually.

Pre-conception interventions

Given the fact that pregnancy imposes physiological stress which is often elevated in proportion to BMI, one solution could be a pre-pregnancy intervention to improve the health and fertility of women pre-conceptually. Whilst a prenatally delivered intervention may offer significant benefits, this is an area which is challenging to address. The lack of evidence in this area reflects these difficulties with the feasibility of any prenatal intervention. Challenges are likely to include identifying women who are planning a pregnancy, and willing to postpone their attempts at conception, until their weight has been reduced. A recent study [30] delivered using the internet was moderately successful in women who were preparing for pregnancy. Despite an attrition rate of close to 55% after the 6 month intervention, an improvement in favourable behaviours was reported. A decrease in alcohol intakes and an increase in compliance with folic acid supplementation was reported, although interestingly no impact on BMI or smoking habits was evident. In general, there was an improvement in the knowledge of participants concerning pre-conceptual health to avoid adverse pregnancy outcomes was shown but this was not universal. The women who completed the programme were more likely to be graduates who were in employment, perhaps suggesting a suitability of these sectors of society to this style
of intervention. This framework is attractive and offers promise to identify those considering pregnancy and improve their preparation for this. As such this area deserves further evaluation.

**Current practice**

According to IOM guidelines, the aim for a pregnant woman who is obese is to minimise their gestational weight gain. However, counter intuitively, current UK practice is not to weigh pregnant women beyond their week 12 booking appointment. The pros and cons of regular weighing throughout pregnancy have been considered but at present regular weighing is only advocated for those at risk of insufficient weight gain, which may compromise a pregnancy and baby weight. NICE do not advocate regular weighing, and at present, there is no evidence from randomised controlled trials to support its use.

Health professionals who deliver antenatal care appear the obvious candidates to expand their routine contacts to address issues associated with weight issues. This is particularly true given the mounting evidence to link high weight gains with development of GDM among other negative maternal and foetal health consequences [31]. Midwives have reported unease about raising the issue of a women’s weight during their consultations. The reasons commonly reported in UK and Australian studies relate to compromising their clinical relationship with their patient and feeling insufficiently trained to manage any weight-related issues [32, 33].

Furthermore, many pregnant women report being unconcerned about their weight gain in pregnancy, despite many having already gained weight in previous pregnancies and failed to return to their pre-pregnancy weight [34]. This study found over 80% of participants expressed dissatisfaction with their current weight but were still resistant to dietary strategies to avoid excessive weight gain. They reported a preference for increasing their physical activity which they recognised as being valuable in pregnancy [35]. However, it is likely that self-assessment of fitness levels is unrealistic and the feasibility of undertaking through increased activity is unrealistic, especially as their pregnancy progressed. It may indirectly suggest that overweight pregnant woman either felt they had sufficient knowledge of ‘healthy eating’ or considered pregnancy a time when self imposed restrained eating to limit weight may be not required.

**Impact of pregnancy and breast feeding on energy requirements**

The myth that a pregnant woman is actually eating for two is an old one, probably first becoming popular in times of food scarcity. In actual fact, there is only a small increase in energy requirements in pregnancy, largely in the third trimester. This is estimated at around 191 kcal/day, when weight gain is most rapid. For those who choose to breastfeed and are able to do so, the additional energy needs for lactation are close to 502 kcal/day. These estimates are based on requirements for those whose BMI is in excess or below the midpoint BMI of 22.5 kg/m² [2, 36]. Whilst it is recognised that breastfeeding has great benefits for maternal and infant health, and should be advocated in all cases, its role in offering benefits in weight control is unclear. It is
Importance of good health and nutrition before and during pregnancy

difficult to distinguish from other factors predicting maternal weight loss post-natally such as low junk food intake, regular physical activity, healthy food choices and hormonal contraception [37].

Underweight and pregnancy outcome

Being of a low BMI (<18.5 kg/m²) has been shown to be a risk factor for poor pregnancy outcome. It is strongly associated with poor or suboptimal fertility and impacts on neonatal health, particularly increased morbidity and mortality risks associated with preterm birth. A low BMI is one of the few modifiable risk factors. However, a cohort study indicated that to undergo large fluctuations in BMI prior to pregnancy has an increased risk of premature birth, a risk higher in someone who had already experienced a pre-term birth [38]. The potential value of pre-conceptual care may be evident in the setting of undernutrition.

Gestational weight gain (GWG) is known to have mixed effects on post-natal health. ALSPAC data have shown that those with low GWG during pregnancy also had a lower initial BMI than those who gained weight as recommended or who exceeded weight gain guidelines. These findings indicate that managing and optimising pre-pregnancy weight may offer health benefits. GWG impacts differently on both mothers and babies and often shows contrasting associations [39].

How can the excessive GWG be challenged?

Given the recognised risks associated with being overweight or obese in pregnancy, there have been a number of studies which have looked at formal approaches to weight management. Weight management in pregnancy is different, and weight loss is not advocated [6]. A stalling of weight gain in the overweight and an increase in appropriate physical activity, such as walking etc., are the only tools that are available and safe to utilise.

Such an intervention was reported in a randomised controlled study in which women with a BMI of close to 35 kg/m² were recruited at 15 weeks gestation [40]. Treatment allocation was either to usual care or to a 10-hour one-to-one intervention delivered by a dietitian. Dietary advice focussed on, low fat food intakes which were eucaloric with the individuals estimated energy requirements. The intervention group minimised their GWG to approximately 7 kg, while the control group gained approximately 13 kg. Glucose metabolism was also superior to the control subjects and this was reflected in a lower glycated haemoglobin (HbA1c). Similar positive findings were seen in other small studies, including one which showed no negative effects from weight management which imposed a moderate energy deficit along with advice to take regular physical activity. Importantly, negative effects on breastfeeding and infant weight were observed, as this is something that practitioner’s report as a potential disadvantage of weight management post-natally [41].

The recently completed randomised controlled LIMIT study appeared an idealised approach to challenge excessive maternal weight gain in obese or overweight pregnant women [42]. Comprehensive dietary advice and plans for appropriate physical activity were delivered using current guidelines and by experts to deliver and reinforce the advice. It was a light touch intervention which offered women with a
singleton pregnancy whose BMI was ≥25 kg/m², guidance and support to minimise excessive weight gain. Primary outcome was the delivery of a baby over the 90th centile weight, with a number of relevant secondary outcomes covering maternal weight and co-morbidities, including delivery methods. Despite this comprehensive intervention, there were no reported differences in either group at birth. Upon reflection, the authors suggested that perhaps the intervention as delivered was insufficiently intensive or too ‘light touch’ and/or that alterations in lifestyle implemented by women were insufficient to impact on outcomes. It is hoped that the ongoing complex lifestyle intervention to challenge excessive GWG, the ‘upbeat study’ [43] will reduce occurrence of GDM and the birth of large for gestational age babies. It is clear that the roadmap to managing GWG, particularly in the obese and overweight, is challenging. The majority of interventions have failed to show clinically important benefits on maternal or infant outcomes resulting from lifestyle interventions. Also of concern is the pilot work that has shown that accessing those pregnant women who are at high risk of negative excess weight–related pregnancies who live in relative poverty can be even more difficult to achieve [44].

Conclusions

Nutritional advice is most often aimed at the pregnant women’s dietary intake, with the aim of ensuring that she is consuming ‘sufficient foods’ from all of the different food groups to achieve the appropriate dietary references values [45] or SACN target [35]. There are opportunities to minimise energy intake, but within current clinical practice in the UK, there are no particular approaches that are regularly in use. Supplementation with folic acid and in many cases vitamin D is now securely supported by evidence; however, compliance with these supplements remains an issue for the more vulnerable in our society.

Prenatal care, such as initiating supplemental folic acid consumption and improving diet composition and reducing body weight where required, is an attractive option to maximise maternal and foetal health. However, the role of fortification of flour with folic acid appears a solution to accessing those in society who are reluctant to comply with supplementation.

All women with a ≥ BMI 30 kg/m² should be advised by a trained health professional of the benefits of healthy food habit and how this can best be put into practice. However, the impact of such advice is unclear, and given the increasing occurrence of obese and overweight pregnancy, it is probably fair to conclude that effects have been very limited. Robust evidence confirms the negative effects of obesity and overweight on maternal and foetal health. Management approaches pre-conceptually and post-natally following current guidelines are valuable; however, the major studies which have used robust study designs and comprehensive interventions to challenge excessive GWG have found only weak effects of the interventions at best. At present, there is insufficient evidence to incorporate these approaches in routine clinical practice.

Perhaps the period of pregnancy is too short to accommodate lifestyle change, given it is 12 weeks of pregnancy before pregnant women enter the care of the midwife and other professionals. It may be that the period between pregnancies is an avenue that can be pursued with new mothers being recruited when attending their post-natal baby checks.
CASE STUDY: AWARENESS OF OBESITY AND RISK TO HEALTH OF WOMEN AND UNBORN CHILD

Question: Current practice in antenatal care in the UK does not recommend regular weighing of women after a booking clinic weight is taken at week 12 or thereabout [6]. Many pregnant women are overweight, or even obese before conception, and often deny that there are any problems which may negatively affect their own and their baby’s health.

You are a midwife faced with a very overweight pregnant lady. Her BMI at her 12 week booking clinic was greater than 35 kg/m², she is hypertensive without family history of pre-eclampsia and this is her first pregnancy. How should you best manage this patient to maximise the chances of a healthy pregnancy and live birth?

Answer:
1. Assess and monitor weight.
2. Aim to prevent excessive weight gain.
3. Support the woman to achieve and maintain an appropriate weight by eating healthily and regularly undertaking physical activity amenable to pregnancy.
   • Advise that eating a balanced and healthy diet and being physically active during pregnancy will offer health benefits to both herself and her unborn child.
   • Dispel any myths about what and how much to eat during pregnancy, explain that energy needs do not change in the first 6 months of pregnancy and increase little in the last 3 months (by around 200 kcal/day).
   • Reputable advice and advice on diet is available to health professionals from NHS choices website, local public health and dietetic departments. NICE [6] indicates that practical and tailored information is considered most effective. This could be dietary advice concentrating on minimising high-calorie snacking and generally reducing overeating.
   • Recommend increasing physical activity. Regular and moderate intensity exercise has been shown to be difficult for pregnant women to implement. The woman should be reassured that this activity will not harm her or her unborn child.
   • At least 30 minutes/day of moderate intensity activity is recommended. Information should be as specific and tailored as possible to the individual. Recreational exercise such as swimming or brisk walking and strength conditioning exercise is safe and beneficial and most likely to be adhered to. Emphasise the aim is to stay fit, rather than to reach peak fitness. For those women who have not exercised routinely they should begin with not more than 15 minutes/day.
   • Offer regular monitoring of weight changes and lifestyle management. This would ideally support any lifestyle changes and provide additional support. This could be the midwife herself or another professional who could support this.

References


16 Steer P. Healthy pregnant women still don’t need routine iron supplementation. *BMJ* 2013; 347: 1.


