Are Women in Early Pregnancy Following the National Pyramid Recommendations?

Abstract:
Appropriate nutrition in pregnancy is fundamental for maternal and fetal health, and the long-term physiological wellbeing of the offspring. We aimed to determine whether a sample of pregnant women met the national guidelines for healthy eating during pregnancy, and to examine if compliance differs when analysed by Body Mass Index (BMI) category. Subjects completed a 24-hr dietary recall, and had their BMI calculated. The mean age was 27.8 years. The mean BMI was 25.1 kg/m^2, with 32 (31.7%) subjects overweight and 14 (13.9%) obese based on BMI category. Although the majority of subjects thought that they had a healthy diet, less than half met the recommended guidelines for each individual food group with achievement of the dairy group being particularly low. Achievement of food group recommendations was not influenced by BMI category. Public health messages on healthy eating guidelines need to be clearly communicated to pregnant women.

Introduction:
Dietary intake in pregnancy is a key determinant of maternal health. Achieving the recommendations of the National Food Pyramid is fundamental for both the mother and of her baby by publishing specific food pyramid guidelines for pregnancy. The Department of Health and Children (DOHC) have highlighted the importance of the maternity diet for the health of both the mother and of her baby by publishing specific food pyramid guidelines for pregnancy. Pregnant Irish women reported that the majority were not achieving the food pyramid dietary guidelines of 2005. However, no reports have been published on whether or not pregnant women are meeting the current 2006 guidelines. The primary aim of this study was to determine whether women in early pregnancy booking for antenatal care met the guidelines for healthy eating during pregnancy, and the secondary aim was to examine if compliance differs when analysed by BMI category.

Methods:
Women attending their first antenatal visit were recruited at their convenience between November 2009 and February 2010. To minimise possible confounding variables such as ethnicity or cultural influences on dietary habits, the study was confined to white European women with an ongoing singleton pregnancy in the first trimester confirmed on ultrasound. An information sheet was provided and written consent obtained. The study was part of a larger study on maternal body composition being carried out at the Coombe Women and Infants University Hospital, Dublin which was approved by the Hospital’s Research Ethics Committee in June 2008. Subjects were interviewed, and sociodemographic, clinical, and attitudinal data were collected. Height was measured with the subject standing erect in bare feet with light clothing using a wall-mounted digital measure (Seca 242). Weight was measured digitally (Tanita MC180) and BMI calculated. Height was recorded to the nearest 0.1 cm and weight to the nearest 0.1 kg. A 24-hour dietary recall was carried out on subjects by a trained nutritionist to record the food and beverage intake of the previous day (weekday only). Dietary intake was analysed by a web-based dietary assessment tool based on the DOHC food pyramid guidelines for healthy eating during pregnancy.

Statistical analyses were performed using SPSS version 15.0 (SPSS Inc. Chicago, IL, USA). Independent t-tests and ANOVA were used to compare means of continuous variables. Variables that were not normally distributed were evaluated using the non-parametric alternative. Chi-square test was used to evaluate differences between categorical variables. Results were considered statistically significant when p < 0.05.

Results:
Women with a medical condition or extreme nausea that was likely to affect normal dietary intake were excluded (n=9), and the final sample size was 101. The mean age was 27.8 years (SD 4.9) and mean weight, height and BMI were 66.9 kg (SD 14.9), 163.3 cm (SD 6.1) and 25.1 kg/m^2 (SD 5.4) respectively. Furthermore, 10 (9.9%) women were underweight (BMI <18.5 kg/m^2), 45 (44.6%) were normal weight (BMI 18.5 - 24.9 kg/m^2), 32 (31.7%) were overweight (BMI 25.0 - 29.9 kg/m^2) and 14 (13.9%) were obese (BMI ≥30 kg/m^2). The mean parity was 0.7 (SD 0.9), mean education at assessment was 12.8 weeks (SD 2.7) and mean age leaving full time education was 20 years (SD 3.7). A large proportion of women smoked during pregnancy 26 (25.7%), and 34 (33.7%) were medical card holders.

When asked what is your main source of information on healthy eating for pregnancy?, the most common answer 34 (33.7%) was just know it yourself with the remaining women answering friends/family 20 (19.8%), websites 20 (19.8%), magazines/books 18 (17.8%), healthcare professional 6 (5.9%) or other 3 (3.0%). Of the women, 85 (84.2%) reported that they knew about the food pyramid, and 77 (76.2%) of these that they understood how to use it. Furthermore, a large proportion of women thought they had a healthy balanced diet 58 (57.4%). None of the 101 women achieved all 5 food group recommendations and 12 (11.9%) did not achieve the recommendation for any food group. Only 1 (1.0%) achieved 4 food group recommendations, 22 (21.8%) achieved 3 food groups, 27 (26.7%) achieved 2 food groups and 39 (38.6%) achieved 1 food group.

The women's achievement of each of the food group recommendations is presented in Table 1. Less than half of the subjects met the guidelines for each individual food group. The food group for which the highest proportion of women achieved the recommendation was breads, cereals, pasta and rice, with 47 (46.2%) achieving the guideline of 6 or more servings per day. The food group for which there was least compliance was dairy foods, with just 5 (5.0%) achieving the recommended intake of 2 servings of milk, cheese and yogurt foods per day during pregnancy. Within subjects who achieved the high fat/sugar food group recommendation (>3 servings), significantly more answered yes to the question do you have a healthy diet? than answered no/sometimes (31 (77.5%) vs. 9 (22.5%), P<0.01). However, there were no differences in the proportion of subjects who answered yes or no/sometimes to the question do you have a healthy diet? within subjects who achieved each of the other food group recommendations (data not shown).

Table 1: Achievement of food group recommendations by BMI category

- For healthy eating during pregnancy, and to examine if compliance differs when analysed by Body Mass Index (BMI) category. Subjects completed a 24-hr dietary recall, and had their BMI calculated. The mean age was 27.8 years. The mean BMI was 25.1 kg/m^2, with 32 (31.7%) subjects overweight and 14 (13.9%) obese based on BMI category. Although the majority of subjects thought that they had a healthy diet, less than half met the recommended guidelines for each individual food group with achievement of the dairy group being particularly low. Achievement of food group recommendations was not influenced by BMI category. Public health messages on healthy eating guidelines need to be clearly communicated to pregnant women.

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are no associations between both the individual and the total number of food group recommendations achieved (0-3 groups) and BMI category. There were also no associations between the total number of food group recommendations achieved (0-3 groups) and age, parity, gestation, age leaving full time education, smoking status, medical card status, and attitudinal measures. However, achievement of fruit and vegetable recommendations was positively associated with older age leaving full time education ($P < 0.01$) (data not shown).

Discussion

Our findings show that the pregnant women in this study are not achieving the current national food pyramid guidelines for healthy eating during pregnancy. Notably, less than half of subjects met the guideline intake for each food group recommendation. This is of concern as maternal nutrition during pregnancy is associated with maternal and fetal well-being. Furthermore, maternal nutrition during pregnancy has been associated with the long-term physiological wellbeing of the offspring due to intra-uterine programming in early fetal life, which affects susceptibility to cardiovascular diseases and diabetes mellitus.

A study of pregnant Irish women ($n=1154$) between 2001 and 2003, although not directly comparable in study methodology, reported similar findings with less than half of subjects achieving each of the food pyramid recommendations for pregnancy, except for fruit and vegetables. In the current study, the food group for which there was greatest compliance was breads, cereals, pasta and rice, with 47% achieving the guideline of 6 or more servings per day. The least compliance was observed for the dairy foods group, with a mere 5% attaining the recommended 5 servings a day. This extremely low rate of achievement is of concern as the dairy food group is the main contributor to calcium intake in Ireland, with milk, yoghurt and cheeses contributing to 44% of the mean daily calcium intake.

However, food-based dietary guidelines in Ireland are currently under revision and the recommendation for dairy foods will be revised to 3 servings for adult females (19-50 years) with no recommendation for additional servings during pregnancy. These revised recommendations are based on the calcium dietary reference intake of 1000 mg/day for all adults (19-50 years). In the current study, only 24% of the women achieved $e$ 3 servings of dairy foods per day (data not shown). Hence, 76% of the subjects did not even reach the lower revised recommendation of 3 servings. Similarly, the achievement of the dairy group was also low in the previous larger study, which reported that only 13% of pregnant women achieved 3 servings a day. Alongside this change, the revised dietary guidelines will also recommend 2 servings from the meat group for adult females (19-50 years) with no recommendation for additional servings during pregnancy. The majority of women (76%) in our cohort achieved $e$ 2 servings from the meat group each day (data not shown).

Our study found that almost half of pregnant women looking for antenatal care were either overweight or obese (32% and 14%, respectively). In the larger study cohort ($n=1200$) from the hospital, the proportion of women who were overweight or obese was 27% and 18% respectively. Interestingly, we found that achievement of food group recommendations was not influenced by BMI category. However, it is important to note that the subjects may have under-reported their food intake; underreporting tends to be highest among women and increases with increasing BMI.

In the current study, only 24% of the women achieved $e$ 3 servings of dairy foods per day (data not shown). Hence, 76% of the subjects did not even reach the lower revised recommendation of 3 servings. Similarly, the achievement of the dairy group was also low in the previous larger study, which reported that only 13% of pregnant women achieved 3 servings a day. Alongside this change, the revised dietary guidelines will also recommend 2 servings from the meat group for adult females (19-50 years) with no recommendation for additional servings during pregnancy. The majority of women (76%) in our cohort achieved $e$ 2 servings from the meat group each day (data not shown).

Although the majority of the pregnant women believe that they have a healthy balanced diet and do not look for advice on healthy eating from official sources, it is clear that they are not achieving the current national guidelines for healthy eating during pregnancy with achievement of the dairy group being particularly low. Furthermore, it appears that this sample of pregnant women perceive that they have a healthy diet if they limit their intake from the high fat/high sugar group without taking into account the need to consider the rest of their diet. This study shows that pregnant women may need to be educated further on healthy eating guidelines. The current public health message and food pyramid recommendations may not be well understood and it is, therefore, paramount that any revised national guidelines for healthy eating be communicated effectively by the health services.

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References