Optimising maternal and infant health through nutritional support

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Outline

• The importance of maternal nutrition
  – To optimise maternal & infant health

• Healthy eating
  – To ensure optimal nutritional intake

• Nutrition Support
  – At risk nutrients
  – At risk groups
The importance of maternal nutrition

• Nutritional status during pregnancy influences:
  – The growth & development of the baby
  – The foundations for the child’s later health
    • Gluckman et al 2005
  – The short & long term health of the mother
    • NICE 2008
Consequences of poor nutrition

• Low birth weight
  – Short term health, risks such as
  – hearing/visual impairment
  – Delays in neural development
    • Hack et al 1995
  – Long term risks
  – CVD, T2 diabetes, hypertension as adults
    • Barker 2008
Healthy eating guidelines for pregnancy

• Pregnant women require slightly higher amounts of some nutrients:
  – Energy (+200 kcal in 3\textsuperscript{rd} trimester only)
  – Protein
  – Vitamins A, B group & C
  – Folic acid
  – Vitamin D
• COMA 1991
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Unlikely to be lacking in a normal balanced diet

Supplements of these are recommended: 400µg & 10µg
New Eatwell Guide 2016

Eatwell Guide

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.

Choose wholegrain or higher fibre versions with less added fat, salt and sugars

Water, lower fat milk, sugar-free drinks including tea and coffee all count. Limit fruit juice and/or smoothies to a total of 150ml a day.

Choose unsaturated oils and use in small amounts

Per day 2000kcal 2500kcal = ALL FOOD + ALL DRINKS

Source: Public Health England in association with the Welsh government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

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Key Nutrients during pregnancy

• Folate
• Vitamin D
• Iron
• Calcium
• Iodine
• Omega 3 fatty acids
Folate

• To prevent Neural tube defects
• Women are recommended to take 400 µg
  – Prior to conception & at least 12 weeks of pregnancy
• ‘At risk’ groups need 5mg
  – Previous history of NTD, BMI >30 or with diabetes
• Fortification of flour
  – In USA has reduced NTD by 40%
  – could have reduced NTD in 2000 UK babies
    • (past 20 years)
    – (Morris et al 2015)
Vitamin D

- NICE (2008) recommend **ALL** pregnant & lactating women should take 10µg/day.
- 25% of women age 19-24
- & 50% of women with dark pigmented skin
- are deficient in vitamin D
  - Ruston *et al* 2004
- Women with BMI > 30 kg/m² also have greater risk
Iron & Calcium

• No *additional* requirements for pregnancy
  – COMA 1991

• However, some women may have poor intake of these key nutrients regardless of pregnancy.
  – Strict vegetarians
  – Teenagers
  – Poor diet
  – Refugees/asylum seekers

• ?Supplements may be required
Iodine in pregnancy

- WHO considers iodine deficiency to be “the single most important preventable cause of brain damage” worldwide
- Severe deficiency in pregnancy is well known to result in cretinism and mental retardation
- Mild deficiency can affect IQ in offspring
  - Bath et al (2013)
- NDNS (2016) 40% of UK women (age 19-50) are deficient in iodine
DRV = 70-140 μg/day (adults)

Sea fish is another valuable source.

A 200ml glass of milk provides 41% of Recommended iodine intake.

Vegetarians who avoid cow’s milk may need an iodine supplement.
Omega 3 fatty acids

- DHA & EPA are important for brain & neurological development of the baby.
- Pregnant women are advised to eat 1-2 portions of **oily** fish per week
  - E.g. Salmon, trout, mackerel, sardine, herring
  - Women who avoid fish could take a fish oil supplement (without vitamin A).
At risk groups

• Adolescents
• Vegetarian/Vegan Women
• Underweight women
• Overweight women
• Refugees/Asylum seekers
• Post bariatric surgery
• Low socio-economic status
Adolescents

• Teenage pregnancy has increased risk of:
  – Poor gestational weight gain
  – Low birth weight
  – Hypertension
  – Pre-term labour
  – Folate, Iron & calcium deficiency
    • Bates et al 2014.
Diets of adolescents

• Poor quality diet
  – Low in milk & dairy products
  – High intake of snacks & junk food
  – Limiting weight gain
  – Vegetarian (but not replacing meat)
    • NDNS, Gregory *et al* 2000.

• But are still growing & achieving peak bone mass, so have higher nutritional requirements.
Vegetarian/Vegan Women

• Women who avoid meat in the diet
  – Need other good sources of iron & zinc
  – Nuts, pulses & fortified cereals* - regularly.

• Women who avoid milk & dairy
  – Need soya products fortified with calcium, or a supplement*

• Omega 3 – walnuts, rapeseed oil regularly
  • *Plant sources are less well absorbed.

• B12 – fortified foods or a supplement needed
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• B12 – fortified foods or a supplement needed

Iodine – high risk of deficiency
Plant sources may be unreliable, so a supplement will be needed.
Under Weight women

• Poor dietary intake – less likely to meet nutritional requirements
• Possible eating disorder?
• In Liverpool:
  – 10% underweight (BMI < 20 kg/m^2)
  – Lowest BMI = 14.3 kg/m^2
    • Abayomi et al 2007
Risks of being underweight

• Miscarriage
• Low birth weight baby
• Inter-uterine growth retardation
• Pre-term delivery
• Anaemia
  – Jeric et al 2013
Over Weight women

- In Liverpool
- 17.2% = obese (BMI ≥30 kg/m²)
  - Highest BMI = 65.7kg/m²
    - Abayomi et al 2007
- Despite excess kcals, quality of diet can be very poor – low in essential micronutrients e.g. iron, calcium.
- “Empty calories”
Refugees/Asylum Seekers

• Vitamin D deficiency
  – Darker skin tone
  – Cultural dress code

• Fleeing conflict/Poverty
  – Poor/Inadequate diet
  – Multiple deficiencies (iron, zinc, Vit A, B, C)
  – Undiagnosed medical conditions
Bariatric Surgery

• Relatively new issue
• Unplanned pregnancy
• Limited dietary intake
• High level of supplementation required
  – Normal pregnancy recommendations are insufficient
• Deficiencies of vitamin A, B12, D reported
• Risk of Foetal abnormalities/undernutrition
• Quality of breastmilk.
Healthy Start

• Low income women ‘at risk’
• UK women in receipt of benefits
• & women < 18 years old
• are entitled to ‘Healthy start’
  – Vitamins (Folic acid, D & C)
  – A Healthy Start voucher per week worth £3.10
  – To buy fruit, veg & milk.
Summary

• Many pregnant women in UK can achieve adequate nutrition via a healthy balanced diet.
• Need to include ALL groups on Eatwell plate.
• Supplements of
• 400µg Folic acid
• & 10µg Vitamin D
• are recommended for ALL pregnant women.
Summary

• ‘At risk’ groups may need to consider additional supplements:
• Strict Vegetarians/Vegans
  – Iron, Calcium, Iodine, B12, Omega 3 f.a.
• Low Income/adolescents
  – Healthy start
• Bariatric surgery
  – Higher dose supplements including vit A
Thank you

• Any questions?