**Female Obesity**

**Epidemiology and Diagnosis**

 Obesity causes a number of health problems. Many obesity related medical problems are well recognised but there are a number of female obesity problems which GPs and the general population are less aware of, this intention of this article is to highlight these so that GPs can share information with their patients at times when they can institute changes to normalise their weight.

 There has been a marked increase in UK obesity rates over the past eight years – in 1993 16% of women were obese and in 2011 this rose to 26% of women1. The proportion of women with a healthy [body mass index (BMI)](http://www.nhs.uk/tools/pages/healthyweightcalculator.aspx), defined as being between 18.5 and 25, fell to just 39% in 2011. Supermarkets arrived from the 1950s and convenience and take away foods are now cultural norms. In addition over 77% of households in the UK have a car and the combination of lack of activity and easily obtainable high calorie foods is the main driver for the obesity epidemic. In Victorian England women used 3-3.5,000Kcal/day and the recommended intake for women is now 2000Kcal/day. After the menopause calorie requirements reduce and visceral fat increases with age and is associated with some ethnic groups. Social deprivation is also a risk factor, 33% of women with no qualifications compared to 17% of women with a degree are obese.

**Definition of obesity in adults (WHO criteria)2a:**



Concerns also relate to abdominal obesity and so waist size: Women with a waist of 88cm (34ins) or more have a 3 times increased risk of type 2 diabetes mellitus (T2DM). Waist circumference is not recommended as a routine measure (NICE cg)3a but can be helpful in assessment if the BMI is below 35kg/m2.

**Science of obesity**

 The science of obesity is developing and for women involves complex relationships between fat, the gastrointestinal tract, ovaries and brain. Fat increases with age (visceral obesity increases after the menopause) and is associated with some ethnic groups. However there has been in effect a 60 year social experiment in adaptation to increased food availability and more sedentary lifestyles. Supermarkets arrived from the 1950s, spearheading a convenience and take-away food culture, and currently over 77% of households in Great Britain have a car. Women are recommended to intake 2,000 Kcal/day, though after 50 years old this requirement declines, but in Victorian England this was 3,000 – 3,500 Kcal/day.

 Scientifically 135 genes have been identified as related to obesity so far. It is thought that epigenetics (foetal programming) is important, obese mothers are more likely to have obese children. Epigenetics is the change of chemical information markers related to DNA but not changing the nucleotide pairs themselves.

Subcutaneous fat doesn’t seem to really matter but white fat around the abdomen proliferates, sets up inflammation, cell death and causes disease, some authorities view obesity as a low grade inflammatory process. Interleukins and tumour necrosis factor (TNF-alfa) are released in obesity which may contribute to the increased risks of cancer.

Nuclei in the hypothalamus: paraventricular nucleus and arcuate nucleus control hunger and satiety.

Adipocytes (fat cells) are endocrine organs; they secrete Adiponectin which regulates fatty acid and glucose metabolism and increases insulin sensitivity. There are low levels of adiponectin in obesity and they are related to insulin resistance. Adiponectin is increased by pioglitazone. Thiazolidines (glitazones: pioglitazone)  modulate the transcription of the insulin-sensitive genes involved in the control of glucose and lipid metabolism in muscle, fat and liver.

Adipocytes secrete oestrogen

Adipocytes secrete leptin to cause satiety; but obesity has high leptin levels but leptin resistance.

Leptin is secreted by fat cells (adipocytes) when lipid levels are high and regulates fat stores. Leptin acts to reduce appetite at the hypothalamus. There are increased levels in obesity BUT patients appear to be Leptin resistant.

Ghrelin acts on the hypothalamus to increase appetite, increases gastric acid and GIT motility. High levels occur before eating. There are high ghrelin levels in Prader-Willi syndrome. There are lower levels of ghrelin after bariatric surgery BUT levels are not reduced in obesity. Ghrelin is produced from GIT: it is secreted by an empty stomach.

The vagus nerve from the stomach signals to the hypothalamus to reduce appetite.

**General disease risks in obesity**

Metabolic syndrome

Hypertension x 4 risk

Dyslipidaemia

Type 2 DM x 13 risk

Gallstones

CKD in type 2 DM

NAFLD/NASH/cirrhosis

Lack of confidence

Depression

CVA

Snoring

Sleep apnoea

CHD

 OA

DVT

Leg oedema

**Managing overweight and obesity in adults – lifestyle weight management services NICE public health guidance 53
Obesity identification, assessment and management: children, young people and adults NICE cg 189 Nov 2014**

Lifestyle weight management programmes are recommended, preferably in groups. Can be by self- referral or referrals from health and social care practitioners. Care is integrated by local authorities, local providers and CCGs.

Aims are to lose weight, prevent weight gain and avoid further weight gain

NICE emphasises non judgmental handling of the situation

 Advise for exercise is 30mins of moderate exercise on 5 days a week. To prevent obesity advise 45 -60mins of moderate intensity exercise a day but if a patient has lost weight having been obese they may need 60-90 mins of exercise to keep it off.

National sources to recommend to patients: Change 4Life and NHS Choices

http://www.nhs.uk/change4life/Pages/change-for-life.aspx

Measure BMI and maybe waist circumference if BMI <35.

Programmes benefit BMI >30, or lower if from black and ethnic minority groups, or other risk factors like DM. Can access programmes if there is capacity from BMI 25-30. Long term dietary and exercise plans are provided and encouraged. There is evidence for health benefits if patients lose 5% body weight for life. Average wt loss is 3% but it varies. Discuss long-term support with patients.

Outcome measure collected by services: % of patients losing 5%. % of patients losing 3% of initial body weight. % of patients adhering to the programme and weight at 12 months after the programme finished.

Orlistat if BMI >28 plus risk factors or BMI >30. Lose 5% body weight in 3 months or stop it. Do not use other medications to lose weight. Using over 12 months to keep weight off needs discussion of benefits/harms

**Cancers can occur at any age but cancer is age related: Increased odds ratios associated with obesity2:**

1.63 endometrial cancer

1.31 gallbladder cancer

Kidney

Liver

Colon

Cervix

Thyroid

1.09 Ovary

1.05Postmenopausal breast cancer

Pancreas

Rectum

Leukaemia

Association with increased BMI and adenocarcinoma of the oesophagus in non-smokers

Pancreas and gastric cancer in obese non-smokers.

Reduced OR: Increased BMI reduces risk of premenopausal breast cancer

2% of thyroid cancer and 30% of endometrial cancers in the UK are due to overweight and obese BMIs.

Risk of endometrial cancer is increased by x 2-3 and if very obese increased by x 6.

Physical activity can **reduce** endometrial cancer risk by 20-30%.

Polycystic ovarian syndrome (PCOS) women have an increased x 4 risk of endometrial cancer in a younger pre-menopause age range related to obesity.

50% of obese people do not think that losing weight reduces their risk of cancer.

**Conception**

Fertility: assessment and treatment for people with fertility problems NICE cg 156 Feb 2013 for everyone:

Over 80% couples conceive in 12 months if woman is <40yrs, no contraception and regular sex. In 2 yrs 90% have conceived.

Women with BMI >30 are likely to take longer to conceive. If they are not ovulating the woman should be told that losing weight is likely to increase her chance of pregnancy. Participation in a group programme to exercise and alter diet leads to more pregnancies than weight loss advice alone. Men with BMI > 30 are likely to have reduced fertility

Investigate women after 12 months of failure to conceive

Offer earlier referral if known barriers to conception or/and the woman is >36yrs old

Early onset obesity is related to oligomenorrhoea, menstrual irregularity, anovulation and subfertility.

Increased rate of miscarriage

Reduced IVF if BMI>30. Women are less likely to come for help with fertility and if BMI >40 less likely to be accepted for treatment

Ovulatory obese women have an increased rate of subfertility but may have less sex.

**Male obesity** associated with low testosterone, Low LH and FSH, reduced spermatogenesis, increased ED, reduced libido.

**Pregnancy related risks and obesity:**

Maternal death

DVT

DM

PET

Severe haemorrhage

Labour induction

Shoulder dystocia

Delivery by caesarean section

General anaesthesia and anaesthetic complications

Poor perinatal outcomes, macrosomia, including stillbirth and neonatal death

 **Bottom Lines**

**Higher maternal complications and mortality, Higher perinatal complications and mortality, More difficult to conceive.**

Measure BMI and waist at booking

Refer for nutritional advice and exercise programmes if your pregnant patient is obese.

Ask women to keep to a BMI 20-25 in pregnancy (Asian women 23)

Take folic acid 5mg a day and 10micrograms Vitamin D supplementation daily during pregnancy and while breastfeeding. Obese patients are often nutritionally deficient compared to non-obese patients

Think T2DM and hypertension

Patients may end up on heparin (DVT prophylaxis) and aspirin (if one other risk factor for PET and obese)

Multidisciplinary teams are required.

**Bariatric surgery follow up**

Bariatric surgery NICE cg indications for considering bariatric surgery are BMI > 40 or

 35-40 and a significant disease aggravated by weight,

failed non surgical measures,

fit for GA and surgery and

agrees to long-term follow up.

BMOSS has guidance on bloods and supplements after various procedure at

 http://www.bomss.org.uk/wp-content/uploads/2014/09/BOMSS-guidelines-Final-version1Oct14.pdf

Follow up in service is first 2 years then annual nutritional status and appropriate supplementation as a shared care protocol , requirements vary with procedure so follow the link above.

Post -bariatric surgery: There may be nutritional deficiency and problems. It is advised to avoid conception for 12- 18 months (limited evidence for this recommendation).

Conception advice post bariatric surgery is for folic acid 400mcg od (amount in Forceval vitamin anyway) but if trying to conceive and the woman has DM and/or obesity increase this to folic acid 5mg od.

Vit A as B-carotene is recommended and is in Forceval : women are advised to avoid vitamin A as retinol in the first 12 weeks of pregnancy.

Every trimester of pregnancy in a woman post-bariatric surgery screen for ferritin, folate, vit B12, calcium and fat soluble vitamins (ADEK)

Multidisciplinary teams are required with a bariatric specialist dietician

Each capsule of forceval contains: http://www.medicines.org.uk/EMC/medicine/16016/SPC/Forceval+Capsules

* Vitamin A (as β-Carotene)
* Vitamin D2 (Ergocalciferol)
* Vitamin B1 (Thiamine)
* Vitamin B2 (Riboflavin)
* Vitamin B6 (Pyridoxine)
* Vitamin B12 (Cyanocobalamin)
* Vitamin C (Ascorbic Acid)
* Vitamin E (dl-α-Tocopheryl Acetate)
* d-Biotin (Vitamin H)
* Nicotinamide (Vitamin B3)
* Pantothenic Acid (Vitamin B5)
* Folic Acid (Vitamin B Complex)
* Calcium
* Iron
* Copper
* Phosphorus
* Magnesium
* Potassium
* Zinc
* Iodine
* Manganese
* Selenium
* Chromium
* Molybdenum
* Excipients with known effect:
* Forceval Capsules also contain Soya Bean Oil up to 1050 mg, Ponceau 4R (E124): 0.12 mg and Amaranth (E123): 0.54 mg.
* 3. Pharmaceutical form
* Brown and maroon, oblong soft gelatin capsule, printed with **FORCEVAL** in white on one side.

**Contraception**

**CHC**

FRSH suggest consider risks of DVT and hypertension in assessing CHC and possibly CHC is less effective in obesity/

BMI>35 risk 3 (don’t use)

BMI 30-34 risk2 (probably okay)

**POP**: okay

**Nexplanon** Current Faculty guidance states that women

with a BMI > 30 can use a progestogen-only implant without restriction and without a reduction in contraceptive efficacy for the duration of the licensed use.

**Depo-provera**: increased weight gain than non-obese women but recommended

**IUS and Cu-IUCD** may be difficult to insert but recommended

**Emergency contraceptions** :

Copper bearing intrauterine device Cu- IUCD

 Ulipristal acetate (UPA) Ella One

 Levonorgestrel (LNG)

Nov 2013 “In clinical trials, contraceptive efficacy was reduced in women weighing 75 kg or more and levonorgestrel was not effective in women who weighed more than 80 kg.“

This has been reversed by FRSH: June 2014: “Emergency contraceptives can continue to be used to prevent

unintended pregnancy in women of any weight or body mass index (BMI). The available data are limited and not robust enough to support with certainty the conclusion of decreased contraceptive effect with

increased bodyweight/BMI.”

 **Obesity is not a contraindication to any of these methods**

* The obese woman attending the GP or Nurse should be thought of holistically, not just BP and CHD risk
* Risks re conception, pregnancy outcomes and cancer are not widely known and discussed.
* There is a whole skill set to develop in discussing these issues.

**References**

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