



# Thyroid Disease in pregnancy

and

# Obesity in pregnancy

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# Thyroid Disease in pregnancy

# Thyroid in pregnancy

- ▶ Thyroid enlarges
- ▶ Circulating iodine is reduced (decreased renal tubular absorption, fetal storage, maternal fetal transfer)
- ▶ Increased oestrogen increases the thyroid binding globulin in pregnancy; this binds the T3, T4 and as a response, the body produces more T3 & T4
- ▶ However free T3 and T4 drop as pregnancy progresses – have to use TSH to diagnose hypothyroidism in pregnancy
- ▶ TSH drops in first trimester – hCG and TSH have the same alpha subunit – HCG can be a TSH agonist. Free T3/T4 elevated in hyperemesis
- ▶ Fetal thyroid begins to function from 12-13 wk. Fetal axis independent of the mother in third trimester
- ▶ Thyroid antibodies cross the placenta, but are not cytotoxic to fetal thyroid cells.
- ▶ TSH receptor antibodies cross the placenta and can result in fetal complications
- ▶ Anti-thyroid antibodies can increase risk of miscarriage

# Thyroid Disease

## ▶ **Hyperthyroidism**

- ▶ Symptoms include weight loss, heat intolerance, tachycardia, hypertension, emotional lability and vomiting, tremor.
- ▶ It is generally diagnosed and treated before conception

## ▶ **Hypothyroidism**

- ▶ Subclinical with few or no symptoms but abnormal levels of TSH (+/- T4)
- ▶ Detection of thyroid autoantibodies confirms the autoimmune causes or in euthyroid women may indicate increased risk of thyroid dysfunction to come
- ▶ Overt symptoms include cold sensitivity, fatigue and dry skin
- ▶ Most commonly caused by endemic iodine deficiency
- ▶ Autoimmune thyroid disease (eg Hashimoto's disease) is the most common when iodine intake is adequate

# Hyperthyroidism

- ▶ Incidence - as high as 2/1000
- ▶ Causes
  - ▶ Grave's disease – commonest 95% – thyroid hyperactivity due to TSH receptor stimulating antibodies
  - ▶ Gestational trophoblastic disease – high HCG
  - ▶ Excessive exposure to iodine
  - ▶ Toxic nodular goitre
  - ▶ Hashimoto's (in some, causes goitre in early stages and temporary hyperthyroidism).
  - ▶ Subacute thyroiditis
  - ▶ Hyperemesis gravidarum, molar pregnancy, struma ovarii

# Hyperthyroidism - effects

- ▶ Maternal
  - ▶ 80% euthyroid
  - ▶ Thyrotoxicosis common in first trimester and post natal
  - ▶ 20% of time, remains stable and but usually need treatment
- ▶ Effects on pregnancy
  - ▶ If thyrotoxicosis is severe --> infertility
  - ▶ Increase in small birth weight, FGR, Preterm labour
  - ▶ Fetal thyrotoxicosis – antibody crosses placenta
  - ▶ Fetus can get goitre and tachycardia
  - ▶ small rise in neonatal mortality – quoted as high as 16% untreated !

# Hyperthyroidism - Treatment

- ▶ Carbimazole or Propylthiouracil (PTU)
- ▶ PTU preferred for cases first diagnosed in pregnancy (less transfer to placenta and breast milk)
- ▶ Doses of <150mg /day unlikely to cause fetal problems
- ▶ Doses Carbimazole <15mg/day or less unlikely to cause fetal problems
- ▶ Beta blockers – propranolol for tachycardia
- ▶ Surgery – usually reserved for severe obstructive issues –stridor, dysphagia
- ▶ Radioactive iodine – not recommended in pregnancy

# Hypothyroidism

- ▶ Incidence as high as 9/1000
- ▶ Pre-existing hypothyroidism:
  - ▶ Preconception counselling: aim for euthyroidism, increased risk of infertility and miscarriage
  - ▶ Treatment: euthyroid women on stable levothyroxine dosage: increase by 2 additional doses per week after positive pregnancy test
  - ▶ Post-partum: return to pre-pregnancy dose
- ▶ Gestational hypothyroidism: Overt hypothyroidism
  - ▶ Definition: elevated TSH with low T4 **OR** TSH >10mIU/L irrespective of T4
    - ▶ obstetric: infertility, miscarriage, pregnancy induced hypertension, preeclampsia, placental abruption, anaemia, and postpartum haemorrhage
    - ▶ Fetal: prematurity, low birth weight and perinatal mortality; long-term: cognitive impairment and developmental delay
  - ▶ Treatment: starting dose approximately 1.6µg/kg/d [6]
- ▶ Subclinical hypothyroidism
  - ▶ Definition: elevated TSH with normal T4
  - ▶ Risks: inconsistent data on association with adverse pregnancy outcomes including miscarriage and preterm birth, no impact on neurological outcome
  - ▶ Treatment: variability in recommendations for treatment, generally 50µg daily [6]



# Hypothyroidism - effects

- ▶ Usually mild
- ▶ Severe hypothyroidism can cause infertility – decreased ovarian function due to raised prolactin (induced by raised TSH)
- ▶ Compared to normal population:
  - ▶ Higher spontaneous miscarriage
  - ▶ Higher pre eclampsia
  - ▶ Higher FGR
  - ▶ Higher stillbirth
  - ▶ If iodine levels are low in the first trimester then fetus can suffer from poor central nervous system development
- ▶ Recommended daily iodine dose is 250mcg per day

# Who to screen?

- ▶ RANZCOG does not recommend routine testing of thyroid function in pregnancy. TSH for those with risk factors. T4 and TPO Ab if TSH abnormal. Local trimester specific reference ranges should be used for diagnosis and to guide treatment.
- ▶ Hx of thyroid dysfunction
- ▶ Goitre
- ▶ Symptoms or signs of thyroid dysfunction
- ▶ Prior head or neck irradiation or thyroid surgery
- ▶ T1DM or other autoimmune disorder
- ▶ Hx of pregnancy loss, preterm birth or infertility
- ▶ BMI  $\geq 40\text{kg/m}^2$
- ▶ Age 30y or older
- ▶ Use of amiodarone, lithium or recent exposure to iodinated contrast
- ▶ FHx of thyroid disease
- ▶  $\geq 2$  prior pregnancies

# Post partum thyroiditis

- ▶ Incidence quoted as high as 5-11%
- ▶ Most common in those with hypothyroidism and TPO antibodies (50-70% develop PN thyroiditis)
- ▶ Presentation often between 3-4 months PN
- ▶ Can be hypothyroid (40%), hyperthyroid (40%), or first hyperthyroid followed by hypothyroid (20%)
- ▶ 50% small painless goitre
- ▶ 25% have FHx of autoimmune thyroid disease
- ▶ More common if have T1DM
- ▶ Treatment symptom related rather than bloods:
  - ▶ Hyperthyroid – beta blockers and hypothyroid - thyroxine

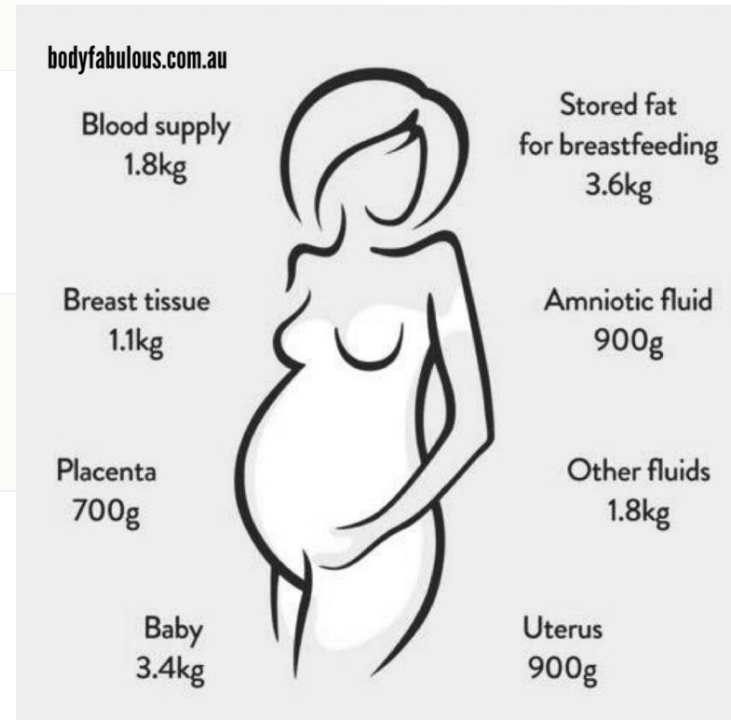
# Obesity in pregnancy

# Obesity in pregnancy

- ▶ SA PPG defines obesity as:
  - ▶ A body weight above 80 kg (!!!)
  - ▶ A weight 50 % or more above the ideal pre-pregnancy weight for height
- ▶ According to maternal body mass index (preferred method – WHO criteria)
  - ▶ 25kg/m<sup>2</sup> to 29.9kg/m<sup>2</sup> (overweight)
  - ▶ 30kg/m<sup>2</sup> to 34.9kg/m<sup>2</sup> (obese I)
  - ▶ 35kg/m<sup>2</sup> to 39.9kg/m<sup>2</sup> (obese II)
  - ▶ Greater or equal to 40kg/m<sup>2</sup> (obese III or morbidly obese)
- ▶ 50% OBESE OR OVERWEIGHT IN AUSTRALIAN PREGNANCIES

# Weight gain parameters

Pre-pregnancy BMI	Recommended weight gain over the whole pregnancy	Recommended weight gain per month in the 2nd and 3rd trimester
BMI less than 18.5 (underweight)	12.5kg to 18kg	2kg to 2.6kg
18.5 to 24.9 (healthy weight)	11.5kg to 16kg	1.5kg to 2.3kg
18.5 to 22.9 if Asian		
25 to 29.9 (overweight)	7kg to 11.5kg	1kg to 1.5kg
23 to 27.5 if Asian		
30 or more	5kg to 9kg	0.8kg to 1.2kg
or over 27.5 if Asian	(less than 5kg if Asian)	



# Obesity in pregnancy

- ▶ SA 2016 data: 27.8% are overweight on entering pregnancy
  - ▶ a further 24.2% classified as obese
- ▶ Strong association with increasing BMI and almost all pregnancy complications
  - ▶ hypertension, diabetes, VTE, wound infection, PPH
  - ▶ Anaesthetic issues
  - ▶ IOL and cesarean section – uterine contractions worse in higher BMI)
- ▶ Increased risk to newborns, not just LGA:
  - ▶ macrosomia, traumatic birth, shoulder dystocia

# Obesity complications - maternal

- ▶ Longer time conceive, increased miscarriage and still birth
- ▶ Diabetes (pre-gestational and gestational)
- ▶ Hypertension (chronic and preeclampsia)
- ▶ Respiratory disorders (asthma and sleep apnoea)
- ▶ Infections (urinary tract, wound, endometritis)
- ▶ Thromboembolic disorders (link to thromboembolism in pregnancy)
- ▶ Anaesthetic (difficult intubation, placement of epidural)
- ▶ Increased preterm labour
- ▶ Increased IOL and Caesarean section
- ▶ Increased PPH
- ▶ Depression and other MH
- ▶ Breastfeeding challenges



# Obesity complications - neonatal

- ▶ Preterm birth
- ▶ Higher perinatal mortality
- ▶ Congenital malformations – missed on US
- ▶ Macrosomia – even if no GDM
- ▶ Intensive care unit admission – often lung related
- ▶ Treatment of jaundice
- ▶ Hypoglycaemia
- ▶ Neonatal and infant death
- ▶ Later childhood obesity, neurodevelopmental differences, language delay

# Obesity Antenatal Care

- ▶ Cared for in facility that can manage potential complications – PPG can guide
  - ▶ Specialist management
- ▶ Accurate pregnancy dating - late in the first or early in the second trimester of the pregnancy
- ▶ Encourage First trimester screen and morphology scan - ? Early morph
- ▶ Lifestyle counselling; Dietary advice – dietician review
- ▶ Early oral glucose challenge test. Then usual time thereafter if negative.
- ▶ Always do OGTT if AC >90%ile at morph.
- ▶ Consider US for BMI > 40 to better estimate EFW – both FGR and macrosomia are hard to pick.
- ▶ Blood pressure using an appropriately sized blood pressure cuff
- ▶ Anaesthetic review
- ▶ Don't forget VTE thromboprophylaxis

# Bariatric surgery

- ▶ Types
  - ▶ Adjustable laparoscopic banding
  - ▶ Gastroplasty
  - ▶ Bypass surgery
- ▶ May need to have bands reduced
- ▶ Extra care with adequate nutrition and supplementation
  - ▶ - micronutrients, check B12, minerals
- ▶ High dose Folate
- ▶ GDM best diagnosed with diurnal BSL readings



# Resources

- ▶ <https://www.health.gov.au/resources/pregnancy-care-guidelines/part-g-targeted-maternal-health-tests/thyroid-dysfunction>
- ▶ <https://cesphn.org.au/wp-content/uploads/2022/10/Management-of-the-underactive-thyroid-in-pregnancy.pdf>
- ▶ [https://australianprescriber.tg.org.au/assets/526733efa94dd275-ef2bb036d9c7-Thyroid-disorders-pregnancy-postpartum\\_40-214.pdf](https://australianprescriber.tg.org.au/assets/526733efa94dd275-ef2bb036d9c7-Thyroid-disorders-pregnancy-postpartum_40-214.pdf)
- ▶ <https://www.racgp.org.au/afp/2012/august/thyroid-disease-in-the-perinatal-period>
- ▶ Handbook of Obstetric Medicine – Catherine Nelson-Piercy
- ▶ Examinations in O&G – Judith Goh
- ▶ <https://www.health.qld.gov.au/qcg/publications>
- ▶ [https://www.sahealth.sa.gov.au/wps/wcm/connect/69226e0047feea3cac28fe21d1663cdf/Women+with+high+BMI\\_PPG\\_v4\\_1.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-69226e0047feea3cac28fe21d1663cdf-oc.kQ00](https://www.sahealth.sa.gov.au/wps/wcm/connect/69226e0047feea3cac28fe21d1663cdf/Women+with+high+BMI_PPG_v4_1.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-69226e0047feea3cac28fe21d1663cdf-oc.kQ00)