

# MANAGEMENT OF THE UNDERACTIVE THYROID IN PREGNANCY

RPA/Canterbury ANSC: Educational Case Study Series - December 2021

Dr Madeleine Elder, Dr Hend Chatila & Dr Arianne Sweeting  
Department of Women and Babies, RPA Hospital

Thyroid hormone plays a vital role in pregnancy, particularly for fetal neurological development. The fetus relies on transplacental transfer of maternal thyroxine, particularly in the first trimester, resulting in an increased thyroid hormone demand and an increased iodine requirement [1,2]. To meet this increased demand, it is recommended that all women who are planning a pregnancy, pregnant or breast feeding ingest approximately 250µg of iodine daily. In most regions, this equates to 150µg of supplemental iodine daily, ideally started 3 months prior to planned pregnancy [1].

Hypothyroidism affects 2-3% of pregnant women and is associated with adverse pregnancy outcomes [3]. Inadequate dietary iodine is the most common cause, followed by autoimmune thyroid disease [4]. Studies suggest that nearly two thirds of Australian women of reproductive age have iodine levels below recommended levels, and 5-15% have thyroid autoantibodies [5].

## Case Study

*Melissa is a 35yo woman who presents to the GP after having a positive urine pregnancy test at 7+2 weeks gestation by LMP. She has had 1 previous early miscarriage and has no significant past medical history. She is taking no regular medications and no supplements. **Should thyroid function screening be included as part of her routine antenatal blood tests?***

Routine testing of thyroid function is not recommended in pregnancy (RANZCOG, 1). At the first antenatal visit, women with risk factors for thyroid dysfunction should have a TSH performed (as early as possible after 6w gestation), with measurement of free T4 and thyroid peroxidase antibody (TPOAb) only if TSH is abnormal [3]. Local trimester specific reference ranges should be used for diagnosis and to guide treatment.

Risk factors include:

- 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  $\geq$  40kg/m<sup>2</sup>
- Age 30y or older
- Use of amiodarone, lithium or recent exposure to iodinated contrast
- FHx of thyroid disease
- $\geq$  2 prior pregnancies

*Melissa is identified as increased risk for thyroid dysfunction (age >30yo, previous miscarriage). Her TSH level returns as 6.2mU/L (1<sup>st</sup> trimester reference range: 0.1-2.5mIU/L). Her rebound free T4 is elevated with negative thyroid autoantibodies. She is diagnosed with overt hyperthyroidism. You counsel her about the role of thyroid hormone in pregnancy and discuss treatment. She is commenced on Levothyroxine 100mcg daily and a pregnancy multivitamin.*

## Management of hypothyroidism in pregnancy:

All women with hypothyroidism in pregnancy should be treated with levothyroxine and referred for endocrinology review, regardless of thyroid peroxidase antibody status.

*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
- Risks: 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]

*Melissa's TSH is monitored 4 weeks later. It is now in the normal range. At her hospital booking visit, she is linked in with the hospital endocrinology team, who review her throughout the pregnancy. She remains euthyroid throughout the pregnancy and goes on to deliver a healthy term baby.*

#### Monitoring of hypothyroidism during pregnancy

TSH should be monitored every 4w in 1<sup>st</sup> trimester, once during 2<sup>nd</sup> and 3<sup>rd</sup> trimesters if dosage is stable, aiming for TSH <2.5mIU/L in the 1<sup>st</sup> trimester, and <3mIU/L in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters. If TSH remains elevated, thyroxine dose should be increased by 12-25µg daily [5].

#### Post-partum care

Following delivery, levothyroxine should be decreased to pre-pregnancy dosage [7, 8]. Women with subclinical hypothyroidism and negative thyroid autoantibodies should cease levothyroxine on delivery.

TSH should be rechecked 4-6 weeks post-partum, with dose adjustment of levothyroxine as necessary, and again at 6 months and 1 year to ascertain ongoing requirement for levothyroxine and screen for post-partum thyroiditis [7]. Approximately one third of women with post-partum thyroiditis will develop permanent hypothyroidism, with increased risk in women with thyroid autoantibodies.

#### References

1. Alexander, E. K., Pearce, E. N., Brent, G. A., Brown, R. S., Chen, H., Dosiou, C., Grobman, W. A., Laurberg, P., Lazarus, J. H., Mandel, S. J., Peeters, R. P. & Sullivan, S. (2017). 2017 Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease During Pregnancy and the Postpartum. *Thyroid*, 27(3), 315-389.
2. National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), 2017. *Thyroid Disease & Pregnancy*.
3. Forehan, S. (2012). Thyroid disease in the perinatal period. *Australian Family Physician*, 41(8).  
<https://www.racgp.org.au/afp/2012/august/thyroid-disease-in-the-perinatal-period>
4. Australian Government Department of Health. (2019). *Pregnancy Care Guidelines, Thyroid dysfunction*.  
<https://www.health.gov.au/resources/pregnancy-care-guidelines/part-g-targeted-maternal-health-tests/thyroid-dysfunction>
5. De Groot, L., Abalovich, M., Alexander, E. K., Amino, N., Barbour, L., Cobin, R. H., Eastman, C. J., Lazarus, J. H., Luton, D., Mandel, S. J., Mestman, J., Rovet, J. & Sullivan, S. (2012). Management of Thyroid Dysfunction during Pregnancy and Postpartum: An Endocrine Society Clinical Practice Guideline. *The Journal of Clinical Endocrinology & Metabolism*, 97(8), 2543-2565.
6. Ross, D.S. (2021). Hypothyroidism during pregnancy: Clinical manifestations, diagnosis, and treatment. UpToDate.  
<https://www.uptodate.com.acs.hcn.com.au/contents/hypothyroidism-during-pregnancy-clinical-manifestations-diagnosis-and-treatment>
7. Larazus, J., Brown, R. S., Daumerie, C., Hubalewska-Dydejczyk, A., Negro, R. & Vaidya, B. (2014). 2014 European Thyroid Association Guidelines for the Management of Subclinical Hypothyroidism in Pregnancy and in Children. *European Thyroid Journal*, 3(2), 76-94.
8. Carney, L. A., Quinlan, J. D. & West, J. M. (2014). Thyroid disease in pregnancy. *American Family Physician*, 89(4), 273-8.