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THYROID STORM: HYPEREMESIS AND SECOND TRIMESTER MISCARRIAGE

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BACKGROUND

Thyroid storm is a life-threatening endocrine emergency. Triggers include surgery, trauma/burns, acute illness, medications and hyperemesis gravidarum. Diagnosis is based on biochemical hyperthyroidism and clinical features including fever, tachycardia, hypotension, heart failure, altered mental state, and gastrointestinal symptoms. In pregnancy, there is significant associated fetal morbidity including preterm birth and fetal death[1,2].

AIM

To describe a case of thyroid storm precipitated by hyperemesis gravidarum.

CASE REPORT

A 34-year-old G4P3 at 19+2 weeks presented with maternal collapse and missed miscarriage diagnosed on routine morphology scan. She was unbooked with a history of hyperemesis gravidarum with a 40kg weight loss. On examination, she was severely dehydrated and haemodynamically unstable.

RESULTS

Pathology reported hyperlactataemia to 9.1 mmol/L, leucocytosis 26.7 x10^9/L, elevated creatinine 227 umol/L with multiple electrolyte abnormalities (hypokalaemia 2.5 mmol/L, hyponatraemia 131 mmol/L) and hyperbilirubinaemia. She was resuscitated with IV fluids, antibiotics and electrolyte replacement. The miscarriage was treated medically without complications or signs of septicaemia. Despite interventions, the patient's tachycardia persisted. ECG showed sinus tachycardia, and echocardiogram demonstrated decreased systolic function (LVEF 32%) and features suspicious of cardiomyopathy (Figure 1). Her thyroid function tests (Table 1) showed severe hyperthyroidism with normal thyroid antibodies. Burch-Wartofsky Point Scale (Figure 2) for risk of thyrotoxicosis was 45, which is consistent with a high likelihood of thyroid storm. She was managed in ICU with propylthiouracil 150mg QID and hydrocortisone 100mg TDS to good effect. Her heart rate, lactate, renal and liver functions all normalised, and TFTs improved. Ultrasound and uptake scan of the thyroid (Figure 3) showed mildly diffuse reduced uptake, consistent with thyroiditis.

Figure 1 – transthoracic echocardiogram demonstrating reduced systolic function with wall motion abnormalities

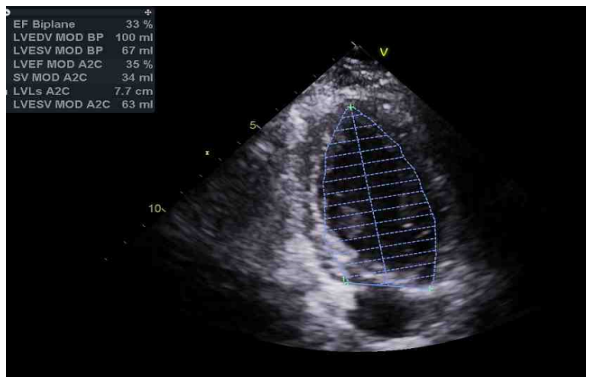


Figure 2 – Burch-Wartofsky Point Scale (BWPS) for Thyrotoxicosis[3]

Diagnostic criteria for thyroid storm*

Thermoregulatory dysfunction	
Temperature (°F | °C)	
99 to 99.9 | 37.2 to 37.7	5
100 to 100.9 | 37.8 to 38.2	10
101 to 101.9 | 38.3 to 38.8	15
102 to 102.9 | 38.9 to 39.4	20
103 to 103.9 | 39.4 to 39.9	25
≥104.0 | >40.0	30
Central nervous system effects	
Mild	10
Agitation	
Moderate	20
Delirium	
Psychosis	
Extreme lethargy	
Severe	30
Seizure	
Coma	
Gastrointestinal-hepatic dysfunction	
Moderate	10
Diarrhea	
Nausea/vomiting	
Abdominal pain	
Severe	20
Unexplained jaundice	

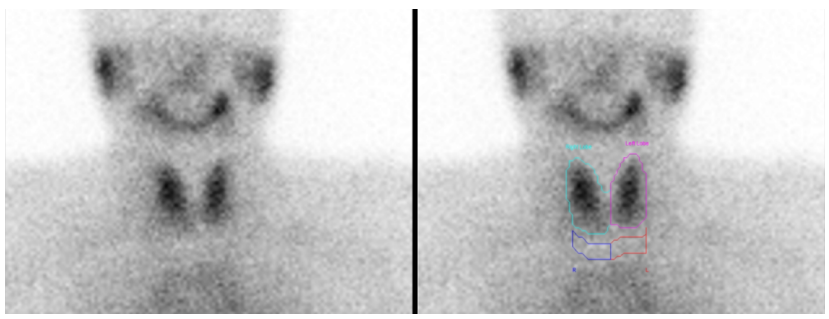
Cardiovascular dysfunction	
Tachycardia	
99 to 109	5
110 to 119	10
120 to 129	15
130 to 139	20
≥140	25
Atrial fibrillation	10
Heart failure	
Mild	5
Pedal edema	
Moderate	10
Bibasilar rales	
Severe	15
Pulmonary edema	
Precipitant history	
Negative	0
Positive	10

* A score of 45 or more is highly suggestive of thyroid storm, a score of 25 to 44 supports the diagnosis, and a score below 25 makes thyroid storm unlikely.

Table 1 – Thyroid function tests throughout admission including thyroid antibodies

	Before antithyroid treatment	Immediately after antithyroid treatment	2 days post treatment	4 days post treatment
TSH (0.40 – 3.50) mIU/L	<0.01	<0.01	<0.01	<0.01
Free T4 (9.0-19.0) pmol/L	53.5	32.0	20.9	17.1
Free T3 (2.6-6.0) pmol/L		4.0	2.9	
Thyroglobulin (0.0 – 28.0) ug/L		38.4		
TG antibodies (≤ 4.0) IU/L		1.2		
TPO antibodies (≤ 5.5) IU/L		<1.0		
TRAb (≤ 2.0) IU/L		1.1		

Figure 3 – Thyroid uptake scan showing a mildly diffuse reduced uptake consistent with thyroiditis



CONCLUSION/DISCUSSION

Thyroid storm in pregnancy is both an endocrine and obstetric emergency with maternal and fetal mortality in 10-30% of cases[2]. As such, prompt recognition of thyroid storm is vital and should be considered a differential in maternal collapse, especially in a woman with a history of hyperthyroidism. This case highlights an example of thyroiditis precipitated by hyperemesis gravidarum resulting in thyroid storm and second trimester miscarriage. Thyroid storm should be suspected based on clinical features and confirmed with biochemical investigations. Hyperemesis can be both a symptom of thyroid disorder[4] as well as a trigger of thyroid storm in pregnancy and should be managed appropriately.

Reference List

1. Hamidi OP, Barbour LA. Endocrine emergencies during pregnancy. Obstetrics and Gynecology Clinics of North America. 2022;49(3):473–89. doi:10.1016/j.ogc.2022.02.003
2. Goodier CG, Loftley AE. Endocrine emergencies in obstetrics. Endocrine Emergencies. 2022;277–84. doi:10.1016/b978-0-323-76097-3.00022-3
3. Burch HB, Wartofsky L. Life-Threatening Thyrotoxicosis: Thyroid Storm. Endocrinology and Metabolism Clinics of North America. 1993;22(2):263–77. doi:10.1016/s0889-8529(18)30165-8
4. Fumarola A, Di Fiore A, Dainelli M, Grani G, Carbotta G, Calvanese A. Therapy of Hyperthyroidism in Pregnancy and Breastfeeding. Obstetrical & Gynecological Survey. 2011;66(6):378–85. doi:10.1097/ogx.0b013e31822c6388