HYPERTRIGLYCERIDEMIA IN PREGNANCY: CLINICAL IMPLICATIONS AND MANAGEMENT STRATEGIES

NAVYA PRADEEPGOUD PATIL

OBSTETRICS AND GYNAECOLOGY

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Introduction

- Triglyceridemia is characterised by elevated levels of triglycerides of more than 150mg/dl in the blood. During pregnancy there is increased physiological levels of triglycerides by 2-3 folds but generally do not exceed 300mg/dl. Hormonal and metabolic changes that occur in the mother contribute to the changes in the lipid profile in healthy, gestating women.These changes can sometimes lead to gestational diabetes and gestational dyslipidemias.
- Gestational hypertriglyceridemia is a frequent mimicker of other conditions such as perforated peptic ulcer, ruptured ectopic pregnancy, pre-eclampsia, placental abruption and uterine rupture.
- It can lead to devastating and even life-threatening complications like acute pancreatitis, hyper-viscosity syndrome, pre-eclampsia etc.
- Fetal risks include macrosomnia, in-utero fetal death, preterm labour, and prematurity.

Therefore it is important to assess the of lipid profile in women with gestational diabetes. Effective management is needed to mitigate risks and improve both maternal and fetal health.

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Pathophysiology

Physiologic alterations occur during pregnancy to ensure sufficient nutrition for the fetus. Estrogen and human placental lactogen levels rise in the late-second and third trimesters.

Estrogen increase	Inhibits Hepatic Lipase
	Stimulates VLDL production
	Stimulates lipogenesis in the liver
Human Placental Lactogen increase	Induces insulin resistance
	Increases lipolysis
Insulin Resistance	Decreases LPL activity
	Increases lipolysis
	Increase CETP
	Stimulates lipogenesis in the liver

This leads to increased substrate (fatty acids) for hepatic TG synthesis. As a result TG levels increase 2 to 3 fold by the third trimester but generally never exceed 300 mg/dL

Case description

- Patient: A 28 year old prime with gestational age 36 weeks with singleton pregnancy, cephalic presentation and posterior placenta.
- Chief complaints: Epigastric pain along with 6-7 episodes of vomiting.

  High BP recording of 190/120 mmhg.
- Imaging: USG revealed mild ascitic fluid collection and placental abruption
- Management: Patient underwent emergency LSCS in view of low bishop score, imminent eclampsia and placental abruption.

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History of present pregnancy

- Diagnosed with hypothyroidism at 12 weeks of gestation and started on Tab. Thyronorm 25mcg OD
- Admitted at 28 weeks of gestation in view of acute gastroenteritis and epigastric pain and was managed conservatively
- Diagnosed with gestational diabetes at 28 weeks of gestation and was started on Tab. Metformin 500mg BD
- No history of raised BP recordings and dyslipidemias.

Family history: No history of familial dyslipedmias.

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Intra-operative findings

- Presence of 30 ml of pink milky peritoneal fluid
- 20 mg of retro-placental clots
- Thin meconium stained liquor
- Placental membranes stained with meconium
- Unhealthy placenta on histopathological investigation revealed fibrinoid necrosis
- Intra-OT blood analysis showed elevated triglyceride levels of 3500 mg/dl

Intra-operative findings

Fig 1. Pinkish milky ascitic fluid collected during LSCS

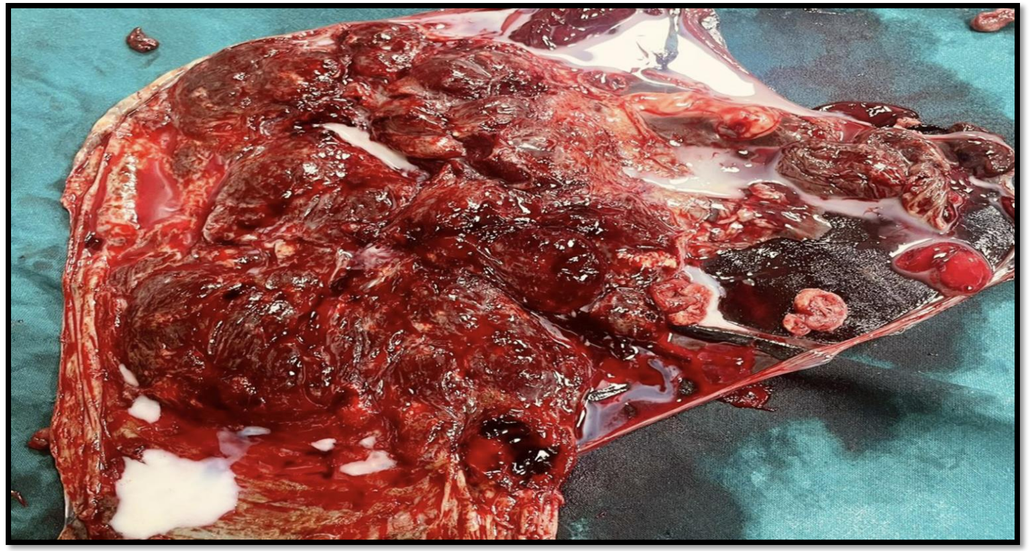

Fig 2. Specimen consists of placenta weighing 340 grams and measuring 18.5 × 15 × 4.5 cm with attached membrane measuring 13 × 6.5 cm. Attached umbilical end measures 12 cm in length. The membranous bit shows white specs. Fetal and maternal surface unremarkable.

Fig 3. Intra-operative blood sample showing white and opaque fluid (lipemic blood sample)

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Management

- Patient was asked to remain nil by mouth and daily fasting triglyceride levels were monitored
  (POD- post operative day)

	POD-01	POD-02	POD-03	POD-04
Triglyceride levels	**1510**	**1171**	**1288**	**2142**

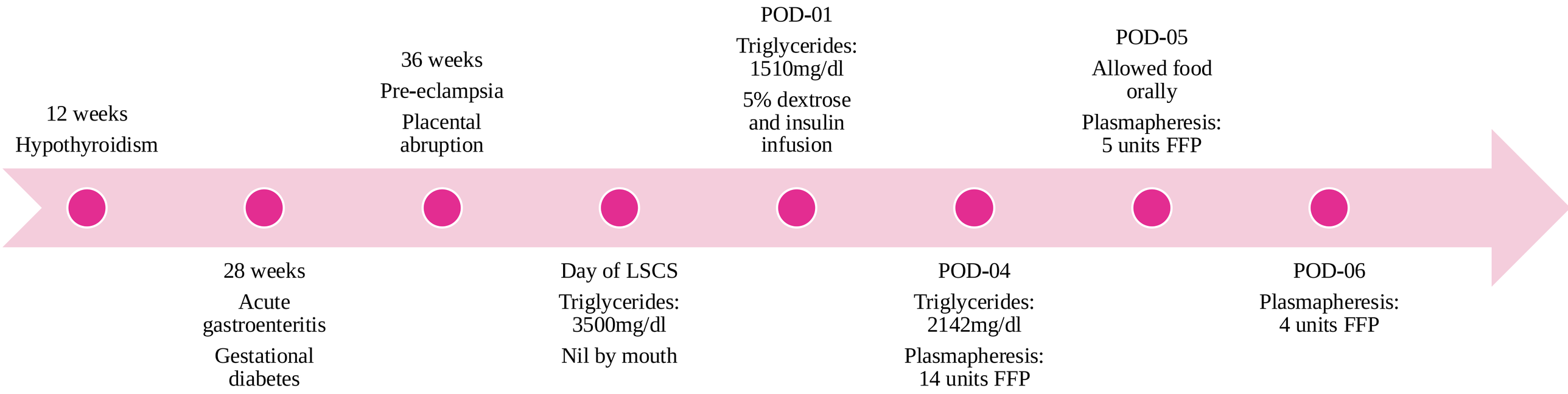
- POD-1 patient was started on 5% dextrose and insulin infusion 40IU at 1ml/hr.
- POD-4 Nephrology reference was taken and the patient was started on plasmapheresis.
- POD-5 patient was allowed to take orally.

Plasmapheresis

Patient underwent 3 sessions of plasmapheresis with 23 units of FFP transfusion along with 5 doses of 100ml albumin

- POD-4: 14 units of FFP
- POD-5: 4 units of FFP
- POD-6 : 5 units of FFP

Overview


12 weeks
Hypothyroidism
28 weeks
Acute gastroenteritis
Gestational diabetes
36 weeks
Pre-eclampsia
Placental abruption
Day of LSCS
Triglycerides: 3500mg/dl
Nil by mouth
POD-01
Triglycerides: 1510mg/dl
5% dextrose and insulin infusion
POD-04
Triglycerides: 2142mg/dl
Plasmapheresis: 14 units FFP
POD-05
Allowed food orally
Plasmapheresis: 5 units FFP
POD-06
Plasmapheresis: 4 units FFP

	Mechanism	Benefit	Risk
Low fat diet < 20% of calories from fat/day	• Reduce substrates for exogenous TG synthesis pathway	• Effective in plasma TG lowering	• Difficult patient adherence • Risk of maternal weight loss and fetal essential fatty acid (EFA) deficiency
Omega-3-acid ethyl esters 3 to 4 g/d orally	• Reduce hepatic TG synthesis • Increase fatty acid oxidation in the liver and skeletal muscle • Enhance LPL activity	• Reduce TG by 25–50% via several mechanisms • Helps avoid deficiency of key omega-3 fatty acids including DHA and EPA	• Fishy taste, mild gastrointestinal side effects (e.g. burping) • May not lower TG quickly enough in acute setting
Medium-chain triglycerides (MCT) 10 to 30 g/d orally Available as supplement but also in coconut oil, palm kernel oil, butter	• Provide nutritional support with rapid small intestine absorption and direct transport of TG via portal vein to liver for oxidation without CM formation • Mitigates the increase in dietary CHO in an isocaloric diet	• Densely caloric (8.3 kcal/g for MCT vs. 3–4 kcal/g for carbohydrate and protein) • Potential positive impact on fetal brain development	• Gastrointestinal side effects (e.g. abdominal discomfort, diarrhea, nausea, intestinal gas)

Fibrates e.g. Gemfibrozil 600 mg twice-daily	• Transcription regulation via (+)PPARα • Increase LPL-mediated catabolism of VLDL particles by up-regulation of LPL, apoA-I, and apoA-II • Decrease apoB and VLDL production by down-regulation of apoCIII expression	• Effective gradual reduction in TG in many genetic forms of HTG, although response genotype dependent	• Safety in pregnancy controversial • May not lower TG quickly enough in acute setting
Parenteral nutrition	• Less increase in TG from iv carbohydrate ingestion compared to enteral carbohydrate nutrition	• Provides source of calories • Helps prevent/reverse maternal weight loss	• Typically requires hospitalization
Insulin Intravenous most often	• Rapid and potent LPL activator	• Immediate dramatic TG-lowering effect	• No clear role for euglycemic patients (risk of hypoglycemia)
Plasmapheresis	• Rapid removal of TG-rich lipoproteins • Removal of inflammatory mediators/ cytokine levels in acute pancreatitis	• Immediate dramatic TG-lowering effect	• Limited availability • High cost • Risk of infection/thrombosis of plasmapheresis catheter line • Transient effect

Current status

- Patient’s blood glucose level are within normal range.
- Patient is on TAB AMLONG 5MG 1-0-0 to manage hypertension
- Patient is on TAB THYRONORM 25MCG 1-0-0 to manage hypothyroidism
- Patient is on TAB ULTEROMEGA 3 0-0-1 to manage hypertriglyceridemia

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Conclusion

- The simultaneous presence of multiple risk factors such as gestational diabetes, hypothyroidism, and triglyceridemia is rare and complicates both diagnosis and management.
- This case highlights the critical need for integrated care strategies and regular assessment of lipid levels, glycemic control, and thyroid function.
- Such cases must be managed by vigilant monitoring and tailored management strategies for the patient. A multidisciplinary approach by a team of obstetricians, endocrinologists and nephrologists is crucial for management of the patient’s condition.

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Thank you