

# The Cream Rises to the Top: A Very Severe Case of Diabetic Dyslipidaemia

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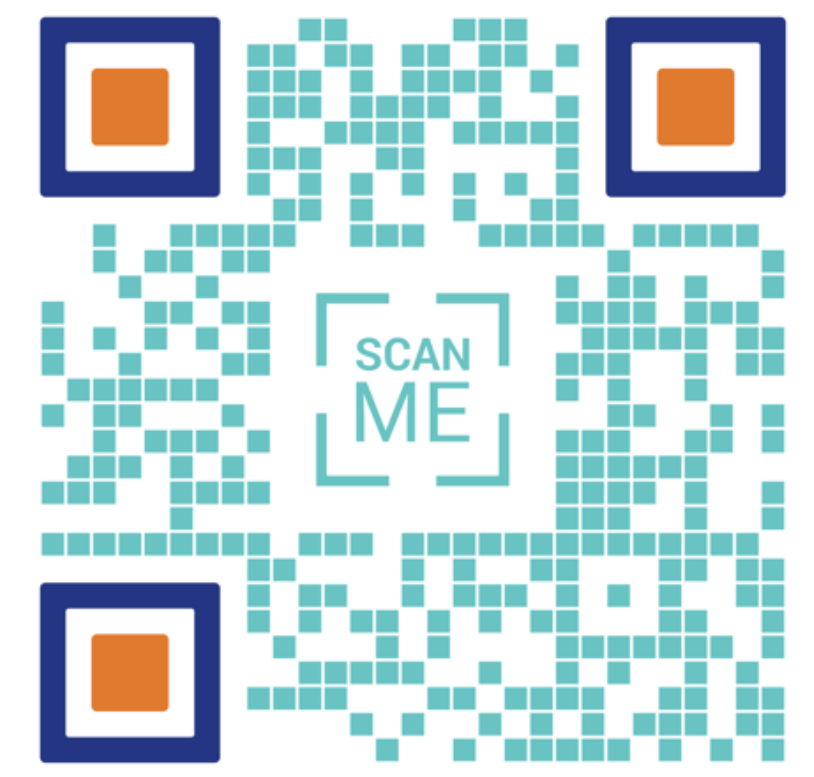
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## Background

- We present a very severe case of diabetic dyslipidaemia, highlighting our diagnostic approach and the utility of the standing plasma or “fridge test”
- Diabetic dyslipidaemia is characterised by hypertriglyceridaemia and high levels of very-low density lipoprotein cholesterol (VLDL-C)
- Its pathogenesis is insulin deficiency or resistance—hepatic lipogenesis and VLDL-C production is upregulated, while lipoprotein lipase is inhibited

## Case Report

- A 46-year-old male presented with severe dehydration and reduced consciousness (GCS 8/15)
- He had recently been diagnosed with diabetes mellitus type 2 [HbA1c 98 (RI 20-42 mmol/mol)] and was referred to Lipid Clinic days earlier [triglycerides 98.9 (RI 0.2-2.3 mmol/l)]
- Plasma glucose, 77.2 mmol/l, was determined by dilution
- He was transferred to Critical Care and received intravenous fluid resuscitation and insulin infusion
- Venous blood specimens appeared grossly lipaemic
- A beta-quantitative lipid profile (external investigation with a two-week turnaround) was requested
- A further aliquot was refrigerated and allowed to separate overnight (standing plasma test)
- By the following morning, only a thin chylomicron layer had developed on top of turbid plasma, supporting a clinical suspicion of diabetic dyslipidaemia (Fig. 1)
- Nasogastric bezafibrate was commenced and subsequent triglyceride assays showed progressive improvement; however, the patient died 12 days post-admission from multi-organ failure secondary to sepsis from aspiration pneumonia
- Beta-quantitative lipids (total cholesterol 13.5 mmol/l and VLDL-C 11.46 mmol/l) and molecular genetic hypertriglyceridaemia panels (no pathogenic variant detected) were available post-mortem, and supported our antemortem diagnosis

## The “Fridge Test”



**Fig. 1** Uniformly turbid plasma with a thin white “cream” layer, indicating that only a small amount of chylomicrons are present (patient’s blood specimen post-centrifugation and refrigerated overnight at 4 °C)

## Take Home Messages

1. Very severe hypertriglyceridaemia, triglycerides  $\geq 22.4$  mmol/l, can be caused by uncontrolled diabetes mellitus
2. An important differential diagnosis to exclude with any grossly lipaemic blood specimen is an inherited hypertriglyceridaemia (e.g. familial chylomicronaemia syndrome) because its treatment markedly differs from diabetic dyslipidaemia
3. Where immediate access to beta-quantitative lipids is unavailable, the standing plasma test can be used to differentiate between diabetic dyslipidemia and familial chylomicronaemia syndrome, by revealing a relative absence of chylomicrons