

Extreme insulin resistance in gestational diabetes mellitus following administration of antenatal corticosteroids; a case report.

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Background:

Gestational diabetes mellitus (GDM) is a common complication of pregnancy. Pregnancies affected by GDM have an increased risk of preterm birth. Antenatal corticosteroids are widely used in the prevention of neonatal complications from preterm birth, yet will contribute to hyperglycaemia in the women with GDM.

Case:

We report a 30 year old, G4P3, with GDM (BMI 32kg/m²) who developed extreme insulin resistance after intramuscular glucocorticoid therapy for threatened preterm labour (TPTL) at 27 weeks gestation.

The patient was diagnosed with GDM at 13 weeks gestation and started on basal-bolus insulin at 15 weeks gestation. Her previous pregnancy was also complicated by GDM, managed with diet. The patient had a history of dermatitis, treated with prednisolone 50 mg daily for the previous 2 years. At admission with TPTL, her total daily insulin dose was 38 units. Following intramuscular glucocorticoid therapy, her insulin requirement escalated to 650 units/day and did not fall despite treatment with Metformin XR 2 grams daily and reduction of prednisolone dose to 12.5 mg daily. Serum C-peptide was 4.5 nmol/l (reference range 0.3-2.4) with glucose 5.5 mmol/l and insulin antibodies were negative. Outpatient treatment with U-500 Humulin R and Toujeo (glargine 300 units/ml) at a total daily dose of ~1350 units failed to achieve adequate glucose control. From 30 weeks gestation, the patient was treated with intravenous insulin infusion as an inpatient. She required 20-40 units/hour during the daytime and 2.5-5 units/hour overnight. She underwent uncomplicated repeat caesarean section at 36 weeks gestation with delivery of a live female (birth weight 3359 grams). The post-partum oral glucose tolerance test was normal, consistent with resolution of severe insulin resistance.

Discussion:

Extreme insulin resistance is rare and is associated with genetic syndromes and autoimmune disorders in the non-pregnant patient. Extreme insulin resistance induced by pregnancy is also uncommon and the mechanism is poorly understood. Case reports have described successful use of U-500 insulin in affected pregnancies¹. However, in this case, U-500 insulin was unsuccessful. In our patient, the use of long-term high dose prednisolone may have been a predisposing factor to the development of extreme insulin resistance following treatment for TPTL.

References:

Zuckerwise LC, Werner EF, Pettker CM, McMahon-Brown EK, Thung SF, Han CS. Pregestational diabetes with extreme insulin resistance: use of U-500 insulin in pregnancy. *Obstet Gynecol.* 2012;120(2 Pt 2):439-42