

A Rare Case of Gitelmans Syndrome in Pregnancy

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ABSTRACT

Gitelman Syndrome (GS) is an autosomal recessive condition characterised by hypokalaemia, hypomagnesaemia and hypocalcuria. Very few cases (around 40 -50) of GS in pregnancy have been reported in the literature. We report a case of GS in pregnancy in a 37 year old primi gravida who had a successful maternal and foetal outcome.

INTRODUCTION

Gitelmans syndrome also known as familial hypokalaemia-hypomagnesaemia, is a rare genetic disorder in which there is a specific defect in the kidney function. This defect impairs ability of the kidneys to reabsorb salt and causes changes in the various electrolyte concentrations, primarily potassium, magnesium, sodium and chloride. It also causes contraction of the extracellular fluid volume, thus causing symptoms of dehydration. GS is the hypocalcuric, hypomagnesaemic variant of Bartter Syndrome. The impact of this condition on the maternal and foetal outcome is still unclear.

CASE PRESENTATION

Our case is a 37 year old primi gravida, a known case of GS, who has been clinically well and has not had any treatment for the past six years. She presented to A&E at 25+5 weeks gestation, feeling unwell with muscle ache and constipation. Investigations showed hypokalaemia and hypomagnesaemia, which was treated with intravenous potassium and oral magnesium. Patient was discharged and advised to attend routine antenatal follow up. At 28 weeks patient was reviewed in the antenatal clinic and also evaluated by the renal team. Although asymptomatic, her potassium and magnesium levels were still low. She was prescribed oral potassium and magnesium supplements and advised high sodium and potassium diet. She was readmitted at 29+ weeks with muscle cramps and lethargy. The diagnosis was hypochloraemic metabolic alkalosis and severe acute kidney injury, an exacerbation of Gitelmans syndrome. The electrolyte imbalance was

corrected and the patient recovered. A plan was made for monitoring her electrolytes on a weekly basis and to continue with oral electrolyte supplements.

Her obstetric growth scan showed a small for gestational age foetus and as pregnancy progressed, foetal Doppler's became abnormal and growth remained static. Hence labour was induced at 35+4 weeks and she had a category 3 caesarean section under spinal anaesthesia for failure to progress. A female baby weighing 2.25kgs was born at 36 weeks with good Apgar scores and cord blood pH. Perioperative and postoperative period were uneventful. Her electrolytes were monitored daily in the postoperative period. She continued to have hypokalaemia, but her other kidney functions improved. She was discharged home and advised follow up with the renal team.

On follow up mother and baby are doing well; mother has been prescribed potassium supplements for life and advised high potassium diet. Her potassium levels are still erratic especially when she is not very compliant with her supplements. She is clinically well and under care of the renal team.

DISCUSSION

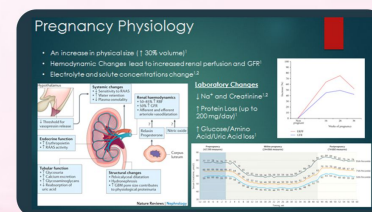
Gitelman syndrome was first described in 1966 by Gitelman et al. It is a rare autosomal recessive salt losing tubulopathy. It is a milder variant of Bartter syndrome with overlapping symptoms. A mutation in the SLC12A3 gene, inhibits the thiazide sensitive sodium/chloride transporter in the apical membrane of the distal convoluted tubule. The tubular defect is identical to chronic ingestion of thiazide diuretic resulting in volume depletion and activation of the renin angiotensin-aldosterone axis (RAAS). Physiological changes in pregnancy increase the activity of RAAS leading to hypokalaemia, especially in the third trimester.

The prevalence is 1/40,000 Caucasian individuals. GS usually becomes apparent anywhere from late childhood to early adulthood. Common symptoms include episodes of fatigue, muscle weakness and muscle cramps, sometimes accompanied by gastrointestinal problems such as abdominal pain, nausea and vomiting. Some adults develop

chondrocalcinosis, accumulation of calcium in the joints, related to hypomagnesaemia. Affected individuals who experience significant electrolyte imbalances develop cardiac arrhythmias, which result from a prolonged QT interval.

Diagnosis of GS is based on identification of characteristic symptoms, a detailed patient history, a thorough clinical evaluation and a variety of specialised tests. Laboratory tests include blood tests to determine serum electrolyte levels, specifically low concentrations of potassium and magnesium and/or elevated levels of renin and aldosterone. Urine electrolyte levels will show high potassium levels in the face of hypokalaemia. Molecular genetic testing can confirm the diagnosis of GS. This can detect the mutations in the specific genes known to cause the disorder, but generally it is not needed to make a diagnosis.

Treatment of GS is directed towards the specific symptoms that are apparent in each individual. It may require the coordinated efforts of a multidisciplinary team of specialists including general internists, nephrologists, cardiologists, social care workers and other health care professionals. The mainstay of treatment is a high salt diet with oral potassium and magnesium supplements. The goal of therapy should always be attenuation of symptoms rather than normalisation of electrolyte abnormalities.



Patient's Pregnancy	
Small for Gestational Age with raised Umbilical Artery Doppler	29+2 weeks: Fx 4.1, Mg 0.08, Ca 2.08, Creat 116, eGFR 10
	30 weeks: Fx 3.1, Mg 0.08, Ca 2.04, Creat 80, eGFR 13
	31+3 weeks: Fx 3.4, Mg 0.09, Ca 2.21, Creat 74, eGFR 12
	32+3 weeks: Fx 3.5, Mg 0.09, Ca 2.58, Creat 100, eGFR 10
Mildly elevated BP, not PET	33+4 weeks: Fx 3.5, Mg 0.09, Ca 2.81, Creat 100, eGFR 10
	34+3 weeks: Fx 3.5, Mg 0.09, Ca 2.81, Creat 116, eGFR 10
Static growth and induction of labour started	35+4 weeks: Fx 3.7, Mg 0.09, Ca 2.81, Creat 131, eGFR 10
	35+5 weeks: Fx 4.0, Mg 0.09, Ca 2.87, Creat 130, eGFR 10
Failure of induction and conversion to Caesarean	36 weeks: Fx 4.9, Mg 0.09, Ca 2.87, Creat 132, eGFR 10

CONCLUSION

The outcome of GS in pregnancy appears favourable provided regular supplementation is used to relieve worsening maternal symptoms. Close antenatal surveillance enables detection of growth restriction and oligohydramnios. Experience of clinician treating pregnant women with GS is limited. No consensus recommendation exists for the management of pregnant patient.

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