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# Therapeutic Plasma Exchange in the Management of Raised Bile Acids in Pregnancy – Case Report

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## Background

Elevated bile acids in pregnancy has been demonstrated to be associated with poorer neonatal outcomes, including stillbirth, meconium passage and respiratory distress[1].Typically this is associated with cholestasis in pregnancy, a condition affecting 0.7% of pregnancies and having an onset around 28 weeks of pregnancy. Therapeutic plasma exchange (TPE) is a process which exchanges a patient's plasma with another fluid, typically 5% albumin. This has been shown to reduce bile acid concentrations and therefore potentially reduce the risk of adverse neonatal outcomes. However, the literature is limited regarding its use for cholestasis in pregnancy, and as such it is not typically a part of apheresis guidelines.

## Case

This case report investigates an asymptomatic pregnant patient with severely elevated bile salts, who was successfully managed via TPE. She was a 30 year old primigravid woman with a background of previous gastric bypass surgery, who was incidentally found to have a markedly raised bile acid level of 340umol/L at 13 weeks of pregnancy. She was initially commenced on cholestyramine and ursodeoxycholic acid after review from hepatology. However her bile acid levels persistently fluctuated beyond 100 µmol/L. As such, she was referred to haematology and admitted for TPE treatment. She underwent 6 cycles of TPE from 29 weeks until 31 weeks of pregnancy.

During this period, she developed episodes of supraventricular tachycardia (SVT) suspected to be potentially secondary to TPE treatment, and was commenced on verapamil following cardiology review. As such, TPE was only commenced if 2 consecutive bile acid levels were >100 umol/L, as values beyond this are associated with poorer neonatal outcomes.

## Results

Bile acid levels overall improved following TPE, from 128 to 4 µmol/L post treatment, however there was significant variation in measured levels during and after treatment, as seen below. The patient underwent an elective caesarean section at 35 weeks due to rising bile acid levels after cessation of TPE. There were overall good maternal and fetal outcomes. The patient recovered well after delivery, and her child had an uncomplicated NICU admission for prematurity and transient tachypnoea of the newborn. In conjunction with the early detection of raised bile acids in pregnancy and levels 2 weeks postpartum remaining elevated at 71 µmol/L, the patient was referred for genetic testing.

## Discussion

TPE was able to temporarily lower bile acid levels in this case. However, it was correlated with episodes of SVT, and it was difficult to determine whether this was secondary to TPE, electrolyte disturbances, vascular catheter tip positioning, or a synchronous, unrelated phenomenon. As it is a relatively novel treatment for use in raised bile acids in pregnancy, potential maternal and fetal complications are not well understood. Overall, this case demonstrates that TPE can be used to successfully lower bile acid levels, especially in cases refractory to medical management alone. However, its complications are not well understood, and it should remain reserved for severe or refractory cases.

### References

[1]Ovadia, Caroline, et al. "Association of adverse perinatal outcomes of intrahepatic cholestasis of pregnancy with biochemical markers: results of aggregate and individual patient data meta-analyses." The Lancet 393.10174 (2019): 899-909.
[2]Chappell, Lucy C., et al. "Ursodeoxycholic acid versus placebo in women with intrahepatic cholestasis of pregnancy (PITCHES): a randomised controlled trial." The Lancet 394.10201 (2019): 849-860.