

HA130 Hemoperfusion Cartridge in the Treatment of Thyroid Storm: A Case Report

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Objective

The objective of this study is to discuss the use of hemoperfusion as alternative option for acute reduction of circulating thyroid hormones for severe thyrotoxicosis where medical treatment is refractory or anti-thyroid drugs are contraindicated.

Method

A 72-year-old male diagnosed case of Graves' disease with thyroid nodules admitted 2 weeks after initiation of Methimazole due to mild agitation, poor oral intake, generalized body weakness, icteresia and jaundice for 3 days associated with oliguria and hypotension of 80/40. On physical examination patient was hypotensive, clinically dry and jaundice. Initial work-up revealed pneumonia and funguria, azotemia and liver function test consistent for cholestatic jaundice and elevated thyroid function test as follow: FT4 3.09 ng/dL and FT3 9.08 ng/dL. Liver scan revealed multiple hepatic hypo-enhancing lesions entire parenchyma, intrahepatic ducts, common bile ducts and pancreatic ducts are not dilated, and normal sized gallbladder with no calculus with possible metastases at spleen, tail of pancreas and left adrenal gland. He was managed as Thyroid storm sec to Graves' disease precipitated by Septic Shock secondary to pneumonia and funguria with a Burch and Wartofsky score of 50, Cholestatic Jaundice secondary to Methimazole Induced Liver Injury, Thyrotoxicosis and Liver Nodules and Acute Renal Failure. Methimazole was discontinued and was started on steroids. Despite medical intervention and decreased FT4 1.98 ng/dL from 3.09 ng/dL, he continued to have hemodynamic instability with new onset atrial fibrillation in rapid ventricular response, altered sensorium and increasing azotemia with oliguria. Patient underwent hemoperfusion due to limited treatment options for persistent thyrotoxicosis in the background of acute liver failure. Hemoperfusion using HA130 for 3 hours was completed for 3 consecutive days. This was combined during hemodialysis which was initiated for azotemia & oliguria, using a high flux dialyzer with blood flow of 150ml/min.

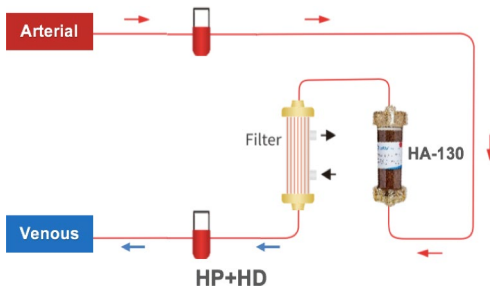


Figure 1. Schematic diagram of HA130 cartridge for hemoperfusion combined with hemodialysis

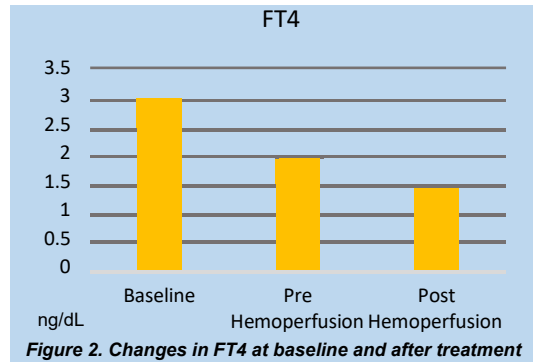


Figure 2. Changes in FT4 at baseline and after treatment

Results

Patient noted to have rapid improvement of hemodynamic status, complete resolution of altered sensorium and atrial fibrillation after completion of hemoperfusion for 3 consecutive days combined with hemodialysis on day 1 and day 3. Repeat FT4 was normalized to 1.31 ng/dL from 1.98 ng/dL with reduction in liver enzymes. Hemodialysis thrice a day was continued as patient remained anuric. However, due to progression of pneumonia on succeeding days patient succumb to infection on the 16th day of hospitalization.

Conclusion

Hemoperfusion using HA130 can be performed as an alternative option for treatment of thyroid storm when oral anti-thyroid therapy are contraindicated such as hepatotoxicity. In a rapid phase, it can be utilized as a cheaper alternative to plasmapheresis to severe thyrotoxicosis or as bridge before definitive surgery. Limited data on the use of resin hemoperfusion is available, experimental study with a larger population is recommended.