Adrenocortical Insufficiency in a Patient with Stable Liver Cirrhosis

Kirresh, A; Htay, T; Muralidhara, K
Department of Diabetes and Endocrinology,
Northwick Park Hospital, London Northwest Healthcare NHS Trust

Case History: A seventy-six-year old Caucasian man was admitted with confusion, irritability and lethargy for one week duration. He has stable Child-Pugh Class A chronic liver disease. On Examination, he was mildly confused (AMTS 8/10), and euvoluameic with a blood pressure 130/78 mmHg and no postural hypotension. Respiratory cardiovascular and abdominal examinations were unremarkable. He was taking spironolactone 150 mg and furosemide 40 mg daily for recurrent ascites.

Investigations:
Haemoglobin 122g/L
White cell 9.8x10⁹/L
Platelet 118 x10⁹/L
Urea 8.7 mmol/L
Creatinine 85 umol/L
Sodium 111 mmol/L
Potassium 5.66 mmol/L
Albumin 33 g/L
ALT 108 IU/L
Alkaline phosphatase 116 IU/L

Random Cortisol 68 nmmol/L
Plasma Osmolarity 242 mOsm/kg
Urine Osmolarity 361 mOsm/kg
Spot urine sodium 39 mosm/L
TSH 2.94 mIU/L, fT4 17.1 pmol/L
FSH 6.0 IU/L
LH 4.5 IU/L
Prolactin 480 mIU/L
IGF1 3.0 mmol/L

CXR: Normal appearances
CT Abdomen: Normal adrenal glands

Although Spironolactone was discontinued the sodium level remained unchanged therefore Standard Short Synacthen test with 250 microgram was performed

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<tr>
<th>ACTH ng/L</th>
<th>Cortisol nmol/L</th>
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<tbody>
<tr>
<td>Basal</td>
<td>9</td>
</tr>
<tr>
<td>30 minutes</td>
<td>204</td>
</tr>
<tr>
<td>60 minutes</td>
<td>252</td>
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Table 1. Short Synacthen test values

Management: As he had a decreased response to Synacthen (Table 1), hydrocortisone 10mg, 5mg, 5mg was commenced which improved his confusion and sodium to 132 mmol/L (Fig 1). Spironolactone was restarted and he was discharged home on hydrocortisone. At two week follow-up, he was well and his sodium was 136 mmol/l.

Discussion and Learning Points
1. Up to 72% of patients with chronic liver disease have adrenal insufficiency.⁴,³⁴²
2. Free cortisol is a better biomarker but is not available for standard clinical use.¹
3. In CLD, there is reduced synthesis of cortisol bind globulin, which overestimates the incidence of AI.⁵
4. There is no consensus treatment guideline, however in critically-ill patients with AI (also known as hepatoadrenal syndrome), glucocorticoid replacement reduces mortality and vasopressor dependence.¹,³
5. 1-year survival rates in non-critically ill patients with cirrhosis with and without AI were 69% and 95% respectively. Therefore, although there is controversy, treatment in this group should be considered.¹,³

References: