Clinical Scenarios in Endocrinology: A handy checklist

Professor Atul Kalhan
FRCP MD (Cardiff Uni) MD (Delhi Uni) MRCPE
Consultant Diabetes & Endocrinology, Royal Glamorgan Hospital
Course Director, Endocrinology Post graduate Diploma/MSc
University of South Wales
The eyes see what the mind knows.

The mind is everything. What you think you become.
~ Buddha
Key objectives

• Clinical scenarios with learning points

• Handy Checklist relevant to Endocrinological practice
Clinical scenario 1

MR GJ, 67-year old

March 2019; SOB on holiday

Investigated for PE

Examination: normal
Investigations

- **FT4**: 5.8 pmol/L (9.2-21.0)
- **TSH**: 1.65 mU/L (0.3-4.4)
- **Prolactin**: >24262 mU/L (85-350)
MRI Pituitary: sagittal and transverse section
## Prolactin levels (mU/L)

<table>
<thead>
<tr>
<th></th>
<th>March 7th</th>
<th>March 18th</th>
<th>June 2019</th>
<th>Sep 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>24,262</strong></td>
<td><strong>7476</strong></td>
<td><strong>1627</strong></td>
<td><strong>904</strong></td>
<td></td>
</tr>
</tbody>
</table>
Thyroid Function Tests

- **TSH**
  - Low
    - FT4/FT3 High
      - Hyperthyroid
  - Normal
    - FT3/FT4 normal
    - Euthyroid
  - High
    - FT3/FT4 Low
    - Hypothyroid
## Thyroid function tests

<table>
<thead>
<tr>
<th></th>
<th>FT4</th>
<th>TSH</th>
<th>Etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low/Low normal</td>
<td>High</td>
<td>Low</td>
<td>normal</td>
</tr>
<tr>
<td>Pituitary/hypothalamic dysfunction</td>
<td>TSH R or TSHoma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iatrogenic</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Clinical Scenario 2
(April 2019)

28-year old woman

9 weeks post-partum

On going fatigue since 2\textsuperscript{nd} trimester of pregnancy

Previously well; Rx: nil
Investigations

- **FT4**: 4.8 pmol/L (8-19)
- **TSH**: 0.55 mU/L (0.3-4.5)
- **Prolactin**: 365 mU/L
MRI Pituitary
Management

• Hydrocortisone and Thyroxine

• Loads of reassurance

• Masterful inactivity
Follow up: July 2019

• Less anxious

• **TSH < 0.01**; FT4 normal

• **Prolactin**: mild rise
MRI Pituitary

April 2019

July 2019
Post-partum hypophysitis

- Post partum; 1 in 7-9 million population

- Signs and symptoms: fatigue, malaise (ACTH/TSH deficiency)

- Is it under-diagnosed?
Clinical scenario 3

30-year old man

SOB on exertion

Finding it hard to play football

Examination: normal
Investigations

- Urea: 10.6 mmol/L
- Creatinine: 120 mmol/L
- Na: 124 mmol/L
- K: 5.5 mmol/L
Addison's disease: rare though worth remembering

• **RP, 10-yr old died** at Morriston Hospital, Swansea, of Addison's disease **in 1990.** Carwyn Jones apology; 2012.

• **RM, a 12-year-old boy 'could have been prevented'** after doctors **failed to diagnose** him with Addison's Disease, a coroner has ruled. He died in his home, **December 2012** after being plagued by a four-month illness.

• **FJ, 12, who died** from rare disease **waited an hour for an ambulance,** **December 2016**
Adrenal insufficiency

- Giddiness, nausea, fatigue
- Autoimmune vs Infection/Malignancy
- **Acute crisis:** vascular collapse, acute abdomen and PUO
- History of steroid use
- Hyponatraemia and Hyperkalaemia
- Unexplained hypoglycaemia
Clinical Scenario 4

Miss JW, 31-year old

Unwell for 2-weeks

Found collapsed at home

Cardiac arrest with VF; DC cardioversion
Examination

On admission

Temp: 34.5 C

BP: 95/40 mm of Hg

Bradycardic

GCS 3/15
<table>
<thead>
<tr>
<th>Investigations:</th>
<th>Actual value</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>129 mmol/L</td>
<td>133 - 146</td>
</tr>
<tr>
<td>Urea</td>
<td>23 mmol/L</td>
<td>2.5 – 7.8</td>
</tr>
<tr>
<td>Creatinine</td>
<td>396 umol/L</td>
<td>46 - 92</td>
</tr>
<tr>
<td>Lactate</td>
<td>5.5 mmol/L</td>
<td>0.5 – 2.2</td>
</tr>
<tr>
<td>Glucose</td>
<td>14.7 mmol/L</td>
<td>3.0 – 7.7</td>
</tr>
<tr>
<td>TSH</td>
<td>230.90 mU/L</td>
<td>0.27 – 4.20</td>
</tr>
<tr>
<td>Free T4</td>
<td>4.7 pmol/L</td>
<td>11.0 – 25.0</td>
</tr>
<tr>
<td>CRP</td>
<td>36 mg/L</td>
<td>&lt;5</td>
</tr>
<tr>
<td>WBC</td>
<td>21.6 * 10^9/L</td>
<td>4.0 – 11.0</td>
</tr>
<tr>
<td>PH</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>11.2</td>
<td>22 – 29 mmol/l</td>
</tr>
</tbody>
</table>
Investigations

- **Troponin:** 321ng/L

- **Echocardiogram:** severe LV impairment with apical ballooning and significant regional wall motion akinesia (RWMA)

- **Coronary angiogram:** normal
<table>
<thead>
<tr>
<th>Date</th>
<th>Symptoms</th>
<th>Investigations</th>
<th>Diagnosis</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2006</td>
<td>Fatigue, Weight gain</td>
<td>TSH: High</td>
<td><strong>Primary autoimmune hypothyroidism</strong></td>
<td>Thyroxine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FT4: Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anti TPO antibodies: Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 2007</td>
<td>Nausea, postural giddiness</td>
<td>Short synacthen test</td>
<td><strong>Primary autoimmune adrenal insufficiency</strong></td>
<td>Hydrocortisone and Fludrocortisone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 hydroxylase antibody: Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 2010</td>
<td>Polydipsia Polyuria</td>
<td>High blood glucose</td>
<td><strong>Type 1 DM</strong></td>
<td>Dietary changes Insulin therapy from 2016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anti-GAD antibody: positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2016</td>
<td>Admission with adrenal crisis</td>
<td>Anti TTG antibody: positive</td>
<td><strong>Coeliac disease</strong></td>
<td>Gluten free diet</td>
</tr>
</tbody>
</table>
Diagnosis

• Myxoedema coma along with adrenal crisis

• Stress response cardiomyopathy (Takotsubo cardiomyopathy)
Management

- Intubation and supportive therapy
- Haemofiltration
- Hydrocortisone and IV Liothyronine (T3)
Thou shall only measure TSH after 4-6 weeks of any therapeutic intervention!

<table>
<thead>
<tr>
<th>Date:</th>
<th>Treatment</th>
<th>TSH (mU/L) NR 0.27 – 4.20</th>
<th>T4 (pmol/L) NR 11.0 – 25.0</th>
<th>T3 (pmol/L) NR 3.1 - 6.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/01/2018</td>
<td>Admission</td>
<td>230.90</td>
<td>4.7</td>
<td>3.9</td>
</tr>
<tr>
<td>11/01/2018</td>
<td>IV T3 (10 mcg TDS)</td>
<td>72.65</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>12/01/2018</td>
<td>IV T3 (10mcg TDS)</td>
<td>49.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14/01/2018</td>
<td>IV T3 (10mcg TDS)</td>
<td>6.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16/01/2018</td>
<td>IV T3 (10mcg BD)</td>
<td>2.65</td>
<td>3.8</td>
<td>3.3</td>
</tr>
<tr>
<td>18/01/2018</td>
<td>IV T4 150 mcg OD</td>
<td>6.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22/01/2018</td>
<td>IV T4 200mcg OD</td>
<td>51.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25/01/2018</td>
<td>Oral T4 175mcg</td>
<td>6.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28/01/2018</td>
<td>Oral T4 175mcg</td>
<td>1.09</td>
<td>21.7</td>
<td></td>
</tr>
</tbody>
</table>
Can Lightening strike the same spot twice!

- APS Type 2 syndrome prevalence: 20/million population

- All 3 major components of APS-2: in <10%

- Coeliac disease in only 1-2%

Statistical probability of such combination < 2/100 million population
Polyglandular endocrine emergency: lessons from a patient, which a book cannot teach

Ahmad S, Giannopoulou A, Owen PJD, Kalhan A

BMJ Case Reports Nov 2018, 2018 bcr-2018-226503; DOI: 10.1136/bcr-2018-226503
Take home message

• **Thyroid dysfunction:** be aware of secondary hypothyroidism

• **Prolactin measurement:** in suspected secondary gland (thyroid/gonadal) failure

• **Adrenal insufficiency:** under-diagnosed

• **Clustering of auto-immune** conditions
Any questions: you must be kidding me!