Endocrinopathies associated with lithium therapy in an Irish tertiary referral centre

Dineen R.¹, Bogdanet D.¹, Thompson D.¹, Thompson CJ³, McKay P.², Boran G.¹, Gibney J.¹, O’Keane V², Sherlock M.¹

¹Department of Endocrinology, The Adelaide and Meath incorporating the National Children’s Hospital, Tallaght, Dublin, Ireland. ²Department of Psychiatry, The Adelaide and Meath incorporating the National Children’s Hospital, Tallaght, Dublin, Ireland. ³Department of Endocrinology, Beaumont Hospital, Dublin, Ireland.

Introduction

- Lithium is used in psychiatric practice as maintenance therapy in bipolar disorder.
- It has a narrow therapeutic index with serious toxic potential.
- Lithium is associated with multiple endocrine and metabolic disturbances but data regarding the rates of these in individual patients is lacking.

Aim

- The aim of this study was to assess the impact of lithium therapy on the development of endocrinopathies.

Method

- In a tertiary referral centre, all patients on lithium therapy from 2000 to 2014 were identified.
- Electrolyte and metabolic profiles were obtained through the biochemistry laboratory electronic records system.

Results

Population Demographics

- 580 patients were identified across the 14 year period.
- The mean age of the population was 54.8 years (± SD 15.69)
- 42% were female and 58% were male.

Table 1. Analysis of lithium use in the population group

<table>
<thead>
<tr>
<th>Lithium Parameter</th>
<th>Median (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Lithium level (mmol/l)</td>
<td>0.82 (0.45)</td>
</tr>
<tr>
<td>Duration of therapy (years)</td>
<td>4.24 (6.66)</td>
</tr>
<tr>
<td>No of lithium level checks/ person</td>
<td>5 (11.9)</td>
</tr>
<tr>
<td>No of patients with toxic lithium levels (% of total)</td>
<td>161 (27.8%)</td>
</tr>
</tbody>
</table>

Table 2. Analysis of patients with Toxic lithium levels

<table>
<thead>
<tr>
<th>Lithium Parameter</th>
<th>Frequency (n) (% of group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypernatraemia (serum Na&gt;145mmol/l)</td>
<td>42 (26.1%)</td>
</tr>
<tr>
<td>Hyponatraemia (serum Na&lt;135mmol/l)</td>
<td>53 (32.9%)</td>
</tr>
<tr>
<td>Impaired renal function</td>
<td>85 (52.8%)</td>
</tr>
<tr>
<td>Hypercalcaemia</td>
<td>18 (11.2%)</td>
</tr>
</tbody>
</table>

*P value <0.001

Hyponatraemia among patients receiving Lithium Therapy

- In total 20.3% of patients had one episode of Hyponatraemia
- 51 (43%) of the patients with Na <135 were inpatients
- 67 (57%) of the patients with Na <135 were outpatients
- 24 patients (4.1% of total study group) developed both hypo- and hyponatraemia during follow-up.

Abnormal Calcium Homeostasis in patients receiving Lithium Therapy

- 503 patients (86.7%) had serum calcium measurements
- 6.4% of these patients had hypercalcaemia
- 16 patients had a PTH level.
- 4/16 with elevated PTH also had impaired renal function.
- 3.8% of these patients had hypocalcaemia
- 3 patients had a PTH level which were appropriately elevated.

Conclusion

- Chronic lithium maintenance therapy and impaired renal function were risk factors for toxicity.
- This study highlights the multiple electrolyte and hormone disturbances observed in patients on lithium.
- Clinicians should be aware of this in order to monitor, detect and institute early and appropriate management of endocrinopathies.