



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, ² Department of Psychiatry, The Adelaide and Meath incorporating the National Children's Hospital, Tallaght, Dublin, Ireland. ³ Department 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 (\pm SD15.69)
- ❖ 42% were female and 58% were male.

Table 1. Analysis of lithium use in the population group

	Median (+/- SD)
Peak Lithium level (mmol/l)	0.82 (0.45)
Duration of therapy (years)	4.24 (6.66)
No of lithium level checks/ person	5 (11.9)
No of patients with toxic lithium levels (% of total)	161 (27.8%)

Table 2. Analysis of patients with Toxic lithium levels

Patients with Toxic Lithium levels	Frequency (n) (% of group)
Hypernatraemia (serum Na>145mmol/l)	42 (26.1%)
Hyponatraemia (serum Na<135mmol/l)	53 (32.9%)
Impaired renal function	85 (52.8%)*
Hypercalcaemia	18 (11.2%)

*P value <0.001

Hypernatraemia among patients receiving Lithium Therapy

- ❖ In total **16.4%** of patients had one episode of Hypernatraemia
- ❖ **34 (36%)** of the patients with Na >145 were **in**patients
- ❖ **61 (64%)** of the patients with Na >145 were **out**patients
- ❖ 29 patients had comparable serum & urine osmolality samples available.
- ❖ **12 /29** had biochemical evidence of nephrogenic diabetes insipidus.

Hyponatraemia among patients receiving Lithium Therapy

- ❖ In total **20.3%** of patients had one episode of Hypernatraemia
- ❖ **51 (43%)** of the patients with Na <135 were **in**patients
- ❖ **67 (57%)** of the patients with Na <135 were **out**patients
- ❖ **24** patients (4.1% of total study group) developed both hypo- and hypernatraemia during follow-up.

Table 3. Thyroid Dysfunction in Patients receiving Lithium Therapy

	Patient Count	% of study population	TPO antibodies checked (n)	TPO antibody positive (n)
TSH >4.2 mU/L	178	30.7%	59	30
TSH <0.3 mU/L	54	9.3%	12	5

Abnormal Calcium Homeostasis in patients receiving Lithium Therapy

- ❖ **503** patients (86.7%) had serum calcium measurements
- ❖ **6.4%** of these patients had **hyper**calcaemia.
- ❖ **16** patients had a PTH level.
- ❖ **4/16 with elevated PTH** also had **impaired renal function**.
- ❖ **3.8%** of these patients had **hypo**calcaemia
- ❖ **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

