More frequent lithium testing in UK Primary Care associates with a lower hospital admission rate for bipolar disorder – what this can tell us about GP practice engagement with this group

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More frequent lithium testing in UK Primary Care associates with a lower hospital admission rate for bipolar disorder – what this can tell us about GP practice engagement with this group

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| Complete List of Authors: | Holland, David; Keele University  
                           | Duff, Christopher; University Hospitals of North Midlands, Department of Clinical Biochemistry  
                           | Farman, Sanam; Mersey Deanery Psychiatric Rotation, Forensic  
                           | Fryer, Anthony; Keele University  
                           | Yung, Alison; University of Manchester  
                           | Bailey, Susan; Academy of the Royal Medical Colleges  
                           | Heald, Adrian; Leighton Hospital, Medicine |

Specialty area:
More frequent lithium testing in UK Primary Care associates with a lower hospital admission rate for bipolar disorder – what this can tell us about GP practice engagement with this group

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Summary

Bipolar affective disorder is one of the leading causes of disability worldwide and carries a substantial risk of suicide.

Here we determined for GP practices in one area of England, the relation of the interval between lithium level checks at GP practice level and psychiatric admission rate for inpatient treatment, for people with bipolar affective disorder monitored at each GP surgery.

We found that the more frequently the tests are requested at the GP practice, the lower the number of admissions per individual. This is relevant to everyday clinical practice and supports the implementation of measures to ensure GP practice engagement with people with bipolar disorder, in order to reduce hospital admissions in this condition.

Letter to the Editor
What is known

Bipolar affective disorder is one of the leading causes of disability worldwide and carries a substantial risk of suicide. Individual episodes of depression and mania can usually be successfully treated, but relapse is common. Prevention of relapse is therefore important to reduce the disability caused by recurrent illness. Lithium became the standard treatment for relapse prevention over a number of decades after the publication of early trials of lithium treatment in the 1960s and 1970s (1,2).
The efficacy of lithium treatment was confirmed in more recent studies which demonstrated that lithium treatment on average reduced the overall risk of relapse during follow-up from 61% to 40%, with the benefit most clear for manic / hypomanic episodes (3,4).

There is the perception that lithium use poses particular problems, such as adverse effects and poor patient adherence (5,6), dose uncertainty, and the occurrence of withdrawal mood destabilisation upon sudden discontinuation (7). In recent years, anticonvulsants have been strongly promoted as alternatives to lithium and are commonly prescribed as mood stabilizers, although this is not supported by the evidence (8).

It is recognised that regular testing of lithium levels is pivotal to successful relapse prevention in individuals treated with lithium, in order to ensure that the correct dose of lithium is being prescribed (9). While much testing of lithium levels is done by specialist teams, lithium level checks at GP practices are often performed. The question that we posed was whether testing frequency at the GP practice bears any relation to patient outcome specifically in relation to hospital admissions.

We determined from 103 GP practices in one area of England (Stoke-on-Trent and North Staffordshire), the relation between the interval between lithium level blood tests at GP practice level and psychiatric admission rate for inpatient treatment, for patients treated at each GP surgery.

**What we did**

This analysis was carried out on data made available to The Benchmarking Partnership. We took data from the laboratory information management system (LIMS) at the University Hospitals of North Midlands NHS Trust (UHNIM) (TelePath, Clinisys Lab Centre; CliniSys Group, Chertsey, Surrey, UK). Data from each site covered the period 1st January 2014 to 31st December 2014. We related this to the Hospital Outcome Statistics (HES) data for inpatient admissions for 103 of the 106 GP practices who send samples for lithium level determination to that laboratory. The data was
provided for each of the 103 practices in the area of Stoke-on-Trent and North Staffordshire.

We used practice level data, so no individual level patient data was included in the analysis. Data was aggregated at a GP practice level as part of a service evaluation.

GP practices were split into groups based on the number of lithium tests adjusted for the number of individuals on the GP practice SMI register.

**What we found**
The data fell into six groups as shown in Table 1, the highest being a test rate of more than 59 tests per 1000 people on the SMI register (all patients), the lowest being a test rate of less than 20 tests per 1000 people on the SMI register. SMI register size at the GP practice varied from 11 to 129 people.

There were three GP practices excluded from the 103 practices analysed here as the laboratory in this study was used routinely as their main referral laboratory.

The data (Table 1) show that overall the more frequently the tests are requested, the lower the number of admissions per 1000 patients on the SMI register. Annual admission rate varied from 0.75 / 1000 patients on the SMI register for the highest test rate practices to 7.8 / 1000 SMI register patients for the lowest test rate practices.

For the percentage of practices with zero admissions, more frequent testing related to a higher percentage of practices with zero admissions. The trends across categories of testing for the number of admissions per 1000 patients and the percentage of practices with zero admissions are shown within the columns in Table 1. In the highest lithium test-rate GP practice group, only one of the twelve practices within that group had an admission where the primary admission code was for bipolar affective disorder. In the lowest test-
rate GP practice group, every single one of the twenty-seven practices had at least one admission. There was an inverse relation between the percentage of GP practices with zero admissions in the period scrutinized and the test rate for lithium levels ($\chi^2 3.2, p= 0.006$).

**What does this may mean**

We have demonstrated that higher frequency of lithium testing relates to a lower hospital admission rate for relapse of bipolar affective disorder. This is an important finding in relation both to patient care / experience / confidence and health care costs. While many lithium levels were requested from specialist psychiatrist services it has been estimated that around 25% of patients with bipolar disorder are looked after in primary care in Stoke-on-Trent and North Staffordshire, UK, where this survey was conducted.

It is possible that frequency of lithium testing is a marker for the overall care process organisation at a GP practice level for people with bipolar affective disorder, as discussed in relation to type 2 diabetes management in a recent paper (10). We have not taken account here of the lithium dosing schedule or the actual lithium level which have been the subject of extensive review elsewhere (11). Not all lithium tests were included in the study because of additional testing by the specialist psychiatry teams. Nevertheless 24% of lithium tests originated from primary care in the year that we looked at here.

The matter of complex long-term condition management in Primary Care has recently received media attention thanks to a report from the Academy of Medical Sciences (12). This highlighted that doctors are seeing a clustering of different physical and mental health conditions in a single patient never previously seen together before. Blood testing whether for lithium levels or other metabolic parameters is an essential part of management of this complex condition and measures to minimise the number and severity of physical comorbidities that arise.

While we accept that although this analysis only looks at one area of the UK it nevertheless merits consideration. We have adjusted the number of lithium
tests at a GP practice for the total number of patients on the SMI register rather than the number of bipolar patients at the practice, as the latter figure was not available to us.

Although we have used admission rate with a relapse of the bipolar affective disorder rather than relapse rate itself, the geographical area is covered by a single Mental Health Trust. Therefore hospital admission policy was consistent for all the GP practices covered by this survey.

In conclusion we have shown that, broadly speaking, the more frequently the lithium blood tests are requested, the lower the number of admissions for bipolar patients on the SMI register. This is relevant to everyday clinical practice and supports the implementation of measures to ensure GP practice engagement with people with bipolar disorder, in order to reduce hospital admissions in this condition. The next step will be to engage with service users in order better to understand how the individual’s relationship with their GP surgery influences their mental health and confidence in the care that the NHS provides.

No author has any conflict of interest in relation to this article

References


2. Kane JM, Quitkin FM, Rifkin A, Ramos-Lorenzi JR, Nayak DD, Howard


<table>
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<tr>
<th>Lithium Test Rate per 1,000 Patients on SMI Register</th>
<th>Admissions for Relapse of Bipolar Disorder per 1,000 Patients on SMI Register</th>
<th>% Practices With Zero Admissions for Relapse of Bipolar Disorder</th>
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Table 1: Lithium testing frequency at the GP practice vs hospital admission rate for bipolar disorder at that practice