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Quality Improvement Within a Mental Health Setting: Alcohol Detoxification

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Abstract

Aims

We describe a clinical audit on alcohol detoxification, using NICE guidelines as a comparable standard. NICE guidelines recommend completing a thorough alcohol history, documentation of a physical examination including screening for Wernicke's encephalopathy, monitoring of vital signs and liver investigations. Breath alcohol level and standardised assessment of withdrawal should be completed in addition to documentation of chlordiazepoxide and thiamine prescriptions. The reported mental health service completed the first cycle of the audit as part of a large-scale, international audit on alcohol detoxification by the Prescribing Observatory for Mental Health, UK (POMH-UK). Two additional audit cycles were completed within the service to ensure continuous quality improvement and clinical effectiveness.

Methods

Retrospective chart reviews were performed for admissions within pre-defined 6-month periods. Inclusion criteria: ICD-10 F10 diagnosis; prescription of alcohol detoxification schedule.

Results

This mental health service demonstrated greater compliance with the NICE standards in comparison to other services in the POMH-UK audit. The second-cycle audit showed increased compliance in most areas compared to the initial results. The third-cycle audit focused on two specific areas that required improvement to optimise quality improvement – Breath Alcohol Level and Clinical Institute of Withdrawal Assessment, documentation of which improved from 79% to 85% and 39% to 91% respectively in the final audit cycle.

Conclusion

The results of this audit indicate that adherence to defined clinical standards within this mental health service exceeds that of the benchmark POMH-UK data. The effectiveness of electronic patient records in improving adherence to set clinical standards, specifically in relation to documentation of clinical parameters is evident. The report also confirms continued improved results with each audit cycle within the service.

Introduction

Quality improvement is an essential component of healthcare systems and necessary to improve patient safety and clinical effectiveness. Following on from recommendations in the Report of the Commission on Patient Safety and Quality Assurance [1], a Patient Safety First initiative was launched by the Health Service Executive. This initiative includes a National Framework for Clinical Effectiveness. Clinical audit is one of the primary processes of clinical effectiveness within this framework, and is empirical in facilitating quality improvement within a healthcare service. We describe a clinical audit within our service, the first cycle of which was undertaken as part of a large-scale international audit.

Alcohol dependence syndrome (ADS) is characterised by a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes priority for a given individual above all other behaviours. Globally, alcohol was responsible for 7.2% of all premature deaths in 2016 [2]. Every year, harmful use of alcohol is responsible for approximately 33 deaths per 100,000 people and 85 million disability-adjusted life-years worldwide [3]. Although most patients at risk of alcohol withdrawal will develop only minor or uncomplicated withdrawal symptoms [4,5], up to 50% of patients with ADS develop clinically relevant symptoms of withdrawal [6,7]. As many as 20% of patients may develop symptoms associated with complicated alcohol withdrawal, including delirium tremens and withdrawal seizures [8,9]. Complicated alcohol withdrawal not only increases the risk of inpatient morbidity and mortality but also extends length of stay in hospital resulting in an accumulation of costs to the healthcare system and the economy. Thus, appropriate treatment of acute alcohol withdrawal is paramount in providing optimal patient care, and on a wider scale in reducing the socio-economic burden of this illness.

National Institute of Clinical Excellence (NICE) guidelines set out a number of recommendations in relation to the diagnosis, assessment and management of alcohol use disorders [10]. Subsequent to the publication of these guidelines, NICE Quality Standards put forward a series of benchmarks against which current practice can be compared [10]. The Prescribing Observatory for Mental Health UK (POMH-UK) are an organisation that run audit-based quality-improvement programmes in specialist mental health services across the UK and Ireland. The mental health service described in this report is the only service in the Republic of Ireland that participated in their programme. In 2014, POMH-UK designed a large-scale baseline audit to assess the inpatient management of alcohol withdrawal, with the standards specified in this comprehensive audit tool derived from the aforementioned NICE guidelines [10]. POMH-UK published these results in their 2014 audit in their report, “Topic 14a: Prescribing in substance misuse: Alcohol detoxification” [11]. Following on from this, a re-audit was completed in 2016 and detailed in a second report: “Topic 14b: Prescribing in substance misuse: Alcohol detoxification” [12]. The mental health service described in this report participated in the 2016 POMH-UK re-audit, along with 42 other trusts across the UK and Ireland. Subsequently, the mental health service also undertook a further two audit cycles in the years 2017 and 2019 to monitor clinical effectiveness and facilitate quality improvement within the service. In this report, the results of the three audit cycles of this mental health service are described in comparison to the POMH-UK audits for benchmarking purposes, and all three audit cycles are compared with one another within the service to monitor quality improvement within the service.

The mental health service described in this report is an independent, not-for-profit organisation that consists of two hospitals with 293 beds catering for those with moderate to severe mental health disorders. Specialised units within the service include the addiction services, eating disorders services and psychiatry of later life. In addition, the service provides general adult psychiatric services for disorders of mood, anxiety, psychosis and personality, and includes an intensive care ward for those with acute needs. There is a 14-bed adolescent unit within the service that treats patients between the ages of 12 and 17 years which was excluded the audit.

Methods

A retrospective chart review was performed for admissions for a pre-defined six-month period for all cycles of the audit. Paper charts were reviewed for the first and second cycles of the audit. Following the introduction of an electronic patient record system, Rio, in October 2017 an electronic chart reviewed was performed for the third and most recent cycle in 2019. A comprehensive audit tool provided by POMH-UK was used to record all metrics. Criteria for inclusion in this audit were 1) International Classification of Diseases, version 10 (ICD-10) F10 diagnosis (mental and behavioural disorders due to use of alcohol), and 2) prescription of a chlordiazepoxide-based detoxification regimen.

Outcomes that were audited were based on the gold standard guidelines. NICE guidelines recommend completing a thorough alcohol history, including an estimation of daily units of alcohol consumed, history of prior alcohol detoxification, duration of alcohol misuse and documenting when misuse was initially identified. These guidelines also recommend the documentation of a physical examination including screening for Wernicke's encephalopathy, monitoring of vital signs, specifically altered heart rate and blood pressure, and investigation of liver function tests. Breath alcohol level and the Clinical Institute Withdrawal Assessment should be completed in addition to documentation of chlordiazepoxide and thiamine prescriptions.

Data collected as part of the large-scale POMH-UK 2016 re-audit, pertains to the addictions service only within the mental health service. The objective of the second cycle was to expand on the original specialist addiction service to evaluate current practice across both hospitals within the service in screening patients adequately on admission for potential for alcohol withdrawal, as well as whether the NICE quality standards for safe detoxification are being achieved. Therefore, results of the second and third cycles of the audit describe both the specialist and general services. These two audit cycles were completed independent of the POMH-UK.

After the first audit an intervention was organised in which the team registrar and team liaison nurse provided a teaching session on important aspects of taking an alcohol history, physical assessment, relevant investigations; blood and CIWA withdrawal scale use. This teaching session took place at a regular Non-Consultant Hospital Doctor teaching session. A review of the alcohol history section of the admission psychiatric proforma also took place and was updated to align with parameters expected in NICE guidelines.

This included adding relevant features of Wernicke's encephalopathy (ataxia, nystagmus and confusion) to the neurological exam section of the proforma. Finally, access to breathalysers was ensured in the admission department. After the second audit cycle an electronic health record system, Rio, was introduced across the hospital. All staff were provided with training on the use of the new system. This system incorporated a specific section on alcohol including the management of alcohol disorders with prompts regarding breath alcohol level and withdrawal assessment and management. This intervention which was introduced after the second audit cycle, and prior to undertaking the third audit cycle, was expected to improve compliance with audit measures.

While the first and second cycles of the audit examine all metrics in the POMH-UK tool, the third audit cycle examines a limited number of metrics, specifically compliance with breath alcohol level and Clinical Institute Withdrawal Assessment. This follows from the recommendation in the previous cycle in which the service demonstrated the ability to exceed the percentage adherence to the majority of key metrics specified by POMH-UK. Undertaking a full audit cycle was not justifiable given the small margins to be gained.

Results

One thousand one hundred and ninety-seven patients were included in the 2014 POMH-UK baseline audit and 1,143 in the 2016 POMH-UK re-audit. Results of the POMH-UK 2014 baseline audit and POMH-UK 2016 re-audit across all 43 trusts are described for benchmarking purposes only. Sixty-three patients from the reported mental health service were included in the POMH-UK 2016 re-audit. Eighty-eight patients were included in the second cycle audit. One hundred and seventeen patients were included in the third and most recent cycle.

The "Alcohol history" in this audit includes documentation of estimated daily units of alcohol ingested on admission, presence of prior alcohol detoxification, documentation of duration of misuse of alcohol and documentation of when alcohol misuse was first identified. The service is exceeding the POMH-UK data in terms of appropriate history taking. This is most likely because there is a specific section on the admission assessment document that addresses addiction history. These results are presented in table 1.

Table 1: Alcohol History.

	POMH-UK Baseline Audit 2014* (n=1197)	POMH-UK Re-audit 2016* (n=1143)	1st Cycle 2016 (Specialist Service) (n=63)	2nd Cycle 2017 (Specialist Service) (n=60)	2nd Cycle 2017 (General Service) (n=28)
Estimated daily units	77%	89%	92%	97%	96%
Prior alcohol Detoxification	73%	71%	92%	100%	96%
Duration of misuse	48%	56%	79%	87%	86%
Misuse first identified	53%	66%	60%	85%	71%

**Data reported for benchmarking purposes only, data not collected by authors.*

Medical review on admission for alcohol detoxification includes a general physical examination in addition to focused examination for signs and symptoms of alcohol withdrawal and Wernicke's encephalopathy. Thus, evidence of documentation of vital signs including heart rate and blood pressure readings and Wernicke's triad of ataxia, confusion and ophthmoplegia were included in the physical examination. Screening for liver damage through blood investigations (liver function tests) were also included as described in table 2.

Table 2: Physical examination and investigations.

	POMH-UK Baseline Audit 2014* (n=1197)	POMH-UK Re-audit 2016* (n=1143)	1st Cycle 2016 (Specialist Service) (n=63)	2nd Cycle 2017 (Specialist Service) (n=60)	2nd Cycle 2017 (General Service) (n=28)
Physical Examination	88%	87%	100%	100%	96%
Ataxia	48%	49%	78%	85%	75%
Confusion	59%	58%	89%	92%	93%
Ophthalmopl-egia	43%	43%	81%	80%	82%
LFTs**	85%	83%	100%	99%	99%
Heart Rate	90%	93%	98%	97%	96%
Blood Pressure	89%	93%	97%	97%	96%

**Data reported for benchmarking purposes only, data not collected by authors.*
***Liver Function Tests.*

In relation to alcohol detoxification-specific prescribing, chlordiazepoxide, a benzodiazepine, is routinely prescribed to all patients requiring a chemical detoxification from alcohol. Alcohol detoxification with Chloridazepoxide was documented by way of either fixed dose of symptom-triggered management. Although front-loading technique is also reported by POMH-UK, this is not reported here as it not used by this particular mental health service. Parenteral thiamine includes thiamine administered both intra-muscularly, intravenously and in instances where thiamine was administered parenterally prior to transition to oral formulation. Parenteral and oral doses of both chlordiazepoxide and thiamine are reported as a combined dose as the aim is to achieve 100% compliance, irrespective of the route used. These results are described in table 3.

Table 3: Alcohol detoxification-specific prescriptions of Chlordiazepoxide and Thiamine.

	POMH-UK Baseline Audit 2014* (n=1197)	POMH-UK Re-audit 2016* (n=1143)	1st Cycle 2016 (Specialist Service) (n=63)	2nd Cycle 2017 (Specialist Service) (n=60)	2nd Cycle 2017 (General Service) (n=28)
Chlordiazepoxide:	92%	91%	100%	100%**	100%
Thiamine:	92%	88%	100%	100%	97%

**Data reported for benchmarking purposes only, data not collected by authors.*

Breath Alcohol Level and Clinical Institute Withdrawal Assessment were checked for correction documentation. As these results were considered more poorly documented in the first two audits, a third cycle of the audit was completed to ensure that these results had improved. Monitoring for alcohol withdrawals during the initial 24 hours is important and the data shows that the service is monitoring blood pressure, heart rate, BAL and CIWA. Use of the CIWA was however lower for the general adult service compared to the Specialist Service yet still exceeded the POMH-UK data of 29%. It is most likely that the severity of the alcohol misuse, and thus the severity of withdrawals, is less for those patients being admitted under the general adult service and the need for CIWA monitoring was judged clinically as not being required. Nonetheless, it was deemed important that the BAL and CIWA documentation were re-audited and these metrics demonstrated an improvement in the third cycle of this audit. Results are described in table 4.

Table 4: BAL and CIWA completion.

	POMH-UK Baseline Audit 2014* (n=1197)	POMH-UK Re-audit 2016* (n=1143)	1st Cycle 2016 (Specialist Service) (n=63)	2nd Cycle 2017 (Specialist Service) (n=60)	2nd Cycle 2017 (General Service) (n=28)	3rd Cycle 2019 (Hospital-wide) (n=117)
*BAL** <24 hours of admission*	22%	26%	84%	87%	79%	85%
*CIWA*** completion*	14%	29%	81%	75%	39%	91%

**Data reported for benchmarking purposes only, data not collected by authors.*

***Breath Alcohol Level.*

****Clinical Institute Withdrawal Assessment.*

Discussion

The findings from this audit suggest that in most key metrics within the service are exceeding the comparable benchmark data provided by the POMH-UK baseline audit. Other services that have developed specific guidelines regarding alcohol detoxification show similar results. An audit by the Royal Cornwall Hospital, UK, identified 83 patients over a 13-week period who were prescribed an alcohol detoxification regimen during their inpatient stay [13]. An audit was undertaken assessing compliance with their local guideline, which was based on the Maudsley Guidelines for alcohol detoxification. This guideline was developed by the gastroenterology team, the psychiatric liaison team and the pharmacy department within the service. The results of their audit also exceeded the benchmark data provided by POMH-UK showing the effectiveness of a service where inter-disciplinary teamwork successfully contributes towards quality improvement. It is empirical to consider that alcohol detoxification regimens may also be implemented on an outpatient basis.

An Irish study described 40 patients who underwent alcohol detoxification in one year and complete records were available for 32 patients. The authors reported that only 17 patients completed the outpatient alcohol detoxification during the year, of whom 7 patients received their second detoxification within two months of the first one [14]. Thus, results of audits on compliance with alcohol detoxification regimens are highly reliant on the type of service and resources within that service.

This report confirms that adherence to defined clinical standards within this mental health service exceeds that of the benchmark POMH-UK data. The effectiveness of electronic patient records in improving adherence to set clinical standards, specifically in relation to documentation of clinical parameters is evident. The ease of access to data for undertaking an audit is an important asset to the service. The intervention that was implemented is one that has been examined in the literature with researchers reporting benefits such as better clinical outcomes e.g. improved quality and reduced medical errors and improved societal outcomes e.g. improved ability to conduct audit and research [15].

The report also confirms continued improved results with each audit cycle within the service. The results of the completed audit cycles demonstrate how regular audit activity enables quality improvement in the healthcare setting. Clinical audit offers a systematic way of assessing and improving patient outcomes and of maintaining professional standards within a healthcare service. Not only does clinical audit improve aspects of patient care but it also confirms that current practice meets the expected level of performance by monitoring outcomes. This report demonstrates the benefits of creating a culture of quality improvement within a service.

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Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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