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Inpatient Prescribing and Monitoring of High Dose Anti-Psychotic Therapy Before and After Introduction of an Electronic Health Record

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Abstract

Aims

To assess adherence to the hospital policy on high dose anti-psychotic (HDAT) prescribing and monitoring.

Methods

Service users who were prescribed HDAT were identified. Clinical records were reviewed to determine adherence to standards set out in hospital policy for prescribing and monitoring of HDAT. The first cycle of this audit was performed in 2016. Following the introduction of an electronic health record (EHR) system, cycle two was conducted in 2020.

Results

HDAT was prescribed for 6 service users in audit cycle one and 16 service users in audit cycle two. Data was available for all 6 service users in the first audit cycle and for 15 service users in the second audit cycle. All service users were consented prior to starting HDAT for both audit cycles. All Individual Care Plans included mention of HDAT in cycle one, dropping to 7 (47%) in cycle two. All service users had a repeat ECG performed where required after HDAT initiation in cycle one, however, for cycle two only 6 (60%) of service users had a repeat ECG. While all service users of childbearing potential had a pregnancy test in cycle one, 5 (83%) had a pregnancy test in cycle two. After one month of HDAT prescription, 4 (40%) of service users had a repeat ECG and 7 (70%) had repeat bloods in cycle two compared to 100% compliance in cycle one. HDAT use was poorly documented in post-discharge correspondence for both audit cycles.

Discussion

Increasing ease-of-use of the EHR system may increase compliance in the future for clinical staff.

Introduction

High dose antipsychotic therapy (HDAT) is defined as (1) A dose of a single antipsychotic which exceeds the upper licensed limit stated in the British National Formulary (BNF, http://www.bnf.org), or (2) a combination of antipsychotics which exceeds the BNF maximum using the percentage method. Using the percentage method, each dose of an antipsychotic is expressed as a percentage of their respective maximum recommended doses, and added together. A value higher than 100% is considered HDAT. Best clinical practice advises that clinicians prescribe according to licenced drug doses while utilising clinical judgement for the management of patient symptoms [1,2]. Occasionally, prescribing outside the BNF maximum dose may be necessary to achieve a therapeutic response. In these situations, monitoring of HDAT is imperative. The hospital policy on prescribing and monitoring of HDAT provides guidance on the management of HDAT.

The use of HDAT is not uncommon. The Prescribing Observatory for Mental Health (POMH-UK) conducted a clinical audit across 48 NHS (National Health Service) mental health trusts involving 9537 patients who were prescribed antipsychotics [3]. This audit found that 28% of inpatients treated in a psychiatric intensive care unit were prescribed HDAT. Studies based in acute psychiatric units in Ireland have reported similar findings. A longitudinal follow-up study within an Irish psychiatric intensive care unit found that 59% of admissions were treated with a cumulative antipsychotic dose >100% BNF maximum recommended daily dose[4]. The authors report a mean daily antipsychotic dosage 139.4% of BNF maximum daily dose. HDAT is not restricted to acute inpatient settings. A review of several 24 hour nurse-staffed community residences in Ireland by the Mental Health Commission found that of a total of 428 residents, 110 (26%) were on HDAT [5]. High doses of antipsychotics often incur significant side effects on patients. A study which examined patients' willingness to report side effects of antipsychotics discovered that of 208 individuals 71.5% had not reported their side effects to their clinician [6]. HDAT increases a patient's risk of metabolic disturbances such as weight gain and diabetes [7] , extra-pyramidal side effects such as akathisia dyskinesia and dystonia, hormonal side effects including hyperprolactinaemia [8], and cardiovascular disease including prolonged QT interval, dyslipidaemia and hypertension[7].

However, despite the side effects of HDAT, high doses of antipsychotics may be necessary in certain situations where the risk of the aforementioned side effects are outweighed by the risk of harm to the patient, or to others, due to an inadequately treated acute mental illness. In such instances, clinicians may require the use of HDAT to enhance or accelerate therapeutic effect, to manage acute behavioural disturbance or to target a particular symptom, or symptom domain such as affective instability. Factors which predict the use of HDAT include younger age, being male, involuntary admission, longer duration of illness, a diagnosis of schizophrenia and a history of violence and aggression [10,11]. Where HDAT is prescribed, adequate monitoring must be performed to ensure patient safety. Guidance on the prescribing and monitoring of antipsychotic medication is provided by the National Institute of Clinical Excellence (NICE), CG 187, *Psychosis and schizophrenia in adults: prevention and management* [9]. The hospital policy on HDAT is based on recommendations found in the aforementioned NICE guideline.

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. This unit was excluded from the audit described in paper.

The hospital policy on HDAT provides guidance on the prescribing and monitoring of HDAT to this effect. A full audit cycle was completed to assess adherence to the hospital policy on HDAT. This included reviewing measures pertaining to physical monitoring, consent to treatment, documentation of HDAT use on the Individual Care Plan and relevant communication with the GP on discharge form hospital.

Methods

The Pharmacy Department identified all patients prescribed HDAT during the period 1st – 31st July 2016. Clinical files in which HDAT was identified were further reviewed by an NCHD to assess adherence to the hospital policy on the prescribing and monitoring of HDAT. An electronic health record system was introduced across the mental health service in 2017. This included electronic prescribing and monitoring of all prescribed medications. A re-audit was completed during the period 1st February 2020 to 1st April 2020. Percentage of BNF maximum adult dosage was calculated using the POMH-UK Antipsychotic Dosage Ready Reckoner, Version 9.

Results

The first cycle of this audit was performed in 2016. HDAT was prescribed for six service users between 1st and 31st July 2016 inclusive. HDAT was newly commenced for two service users, four were prescribed HDAT prior to admission. Of the two who were initiated on HDAT during the admission, HDAT was discontinued before discharge for one and the other remained in hospital at the time of the clinical audit review.

A second cycle of the audit was completed in 2020. HDAT was prescribed for 16 service users during the period 1st Feb to 1st April inclusive. Clinical data was not available for one service user. Of the remaining 15, HDAT was newly commenced for 10 service users during admission; five were already prescribed HDAT prior to admission. Of the 10 service users who were initiated on HDAT during the admission, HDAT was discontinued before discharge for seven of those service users. Of the five service users who were prescribed HDAT prior to admission, all remained on HDAT at time of discharge. 100% compliance was expected for all clinical audit measures as listed in table 1.

Table 1. *Audit Measures Summary.*

Measure 1	Informed consent was obtained to prescribe HDAT
Measure 2	HDAT was documented on the Individual Care Plan (ICP)
Measure 3	Appropriate baseline tests were performed prior to HDAT initiation*
Measure 4	Pulse rate, blood pressure, temperature were monitored daily for the first week after HDAT initiation and following each dose escalation for the duration of HDAT
Measure 5	ECG was performed and repeated if required after HDAT initiation
Measure 6	A pregnancy test was done for all women of child bearing potential prior to prescription of HDAT
Measure 7	The appropriate tests were performed at 1 month**
Measure 8	HDAT monitoring post discharge was agreed with the GP

* *Weight/BMI, Bloods (full blood count (FBC), renal function tests (RFTs), liver function tests (LFTs), fasting glucose, fasting lipids, prolactin levels, creatinine phosphokinase), ECG, Vital Signs*

** *Weight/BMI, routine bloods (FBC, RFTs, LFTs, fasting glucose, fasting lipids), ECG*

Exceptions 1, 3, 4, 5, & 7 *HDAT already prescribed on admission*

Exception 7 & 8 *HDAT discontinued*

Table 2. *Audit Measures 1-5.*

	Audit Cycle 1	*Audit Cycle 2*
Measure 1 Informed consent was obtained to prescribe HDAT	*100%*	*100%*
Measure 2 HDAT was documented on the Individual Care Plan (ICP)	*100%*	*47%*
Measure 3 Appropriate baseline tests were performed prior to HDAT initiation	*100%*	*95%*
Measure 4 Pulse rate, blood pressure, temperature were monitored daily for the first week after HDAT initiation and following each dose escalation for the duration of HDAT	*100%*	*90%*
Measure 5 ECG was performed and repeated if required after HDAT initiation	*100%*	*60%*

All service users were consented prior to starting HDAT for both audit cycles. All Individual Care Plans included mention of HDAT in cycle one, dropping to 47% in cycle two. The appropriate baseline tests were performed for all service users in the first cycle and for 95% of service users in the second audit cycle. Vital signs were monitored appropriately for all service users after each dose escalation in audit cycle one, and in 90% of service users in cycle two. All service users had a repeat ECG performed where required after HDAT initiation in cycle one, however, for cycle two only 60% of service users had a repeat ECG.

Table 3. *Audit Measure 6.*

	Audit Cycle 1	*Audit Cycle 2*
Total number of females	*3*	*8*
Females of child bearing potential	*2*	*6*
Pregnancy tests completed prior to HDAT prescription	*2*	*5*

While all service users of childbearing potential had a pregnancy test in cycle one, 5 (83%) had a pregnancy test in cycle two.

Audit Measure 7: The appropriate tests were performed at 1 month

Audit Cycle 1: Two service users were commenced HDAT following admission. One service user remaining on HDAT at one month had the appropriate tests done except weight/BMI. HDAT was discontinued before one month for the other service user.

Audit Cycle 2: Ten service users were commenced on HDAT following admission. Eight had a repeated weight, four had a repeat ECG, and seven had a repeat set of routine bloods.

Audit Measure 8: Monitoring post discharge was agreed with the GP.

Audit Cycle 1: Of the two who were initiated on HDAT, one HDAT prescription was discontinued during the admission and the other remained in hospital at the time of the clinical audit review. There was no specific mention of HDAT on the discharge summaries for three of the four service users already prescribed HDAT.

Audit Cycle 2: Eight service users were discharged from hospital on HDAT, five of these service users were previously on HDAT prior to admission and 3 newly commenced on HDAT during admission. In total, four of these service users had HDAT specially mentioned on the GP discharge summary and the remaining four did not specifically mention HDAT.

Discussion

Overall, the results of this clinical audit reflect good practice in the prescribing of high doses of antipsychotics. For those who were newly commenced on high doses of antipsychotics following admission, the majority of this cohort of service users were no longer prescribed high doses of antipsychotics prior to discharge from hospital. Furthermore, the overall low incidence of HDAT within this relatively large mental health service consisting of almost 300 beds demonstrates good prescribing practice.

Interestingly, those who were admitted to hospital on high doses of antipsychotics were discharged from hospital on high doses of antipsychotics in all cases. This may reflect the severity of their mental illness requiring continued increased doses of antipsychotics to manage symptoms. In practice, high dose regimens are continued if the drug trial shows evidence of benefit that is not outweighed by tolerability or safety problems. Indeed, it is worth noting that due to varying pharmacokinetics differences between individuals, insufficient drug might reach the effect site, meaning that high doses of antipsychotics are required to manage symptoms. Low drug plasma levels and insufficient antipsychotic blockade of D_2 receptors at standard doses for some patients may result in an undertreated illness and thus a trial of high doses of antipsychotics may be required.

While some results from this clinical audit are positive, such as documentation of consent for treatment with HDAT, other measures are poorly documented, most notably documentation of HDAT on the ICP. The introduction of an electronic health record system has been hugely valuable and successful across the service in terms of service efficiency. However, this clinical audit reflects a deterioration in HDAT monitoring following the introduction of an electronic health record system. A study by Baumann et al. reported an increase in documentation time among physicians and nurses after the introduction of an electronic health system[12], which may increase frustration levels and lead to poorer clinical documentation. Changes to the electronic system may help to increase usability of the system for clinical staff and improve documentation of HDAT monitoring. A well-designed and efficient electronic system has the potential to capture all data required to manage a service user's condition and increase the chances of a good clinical outcome. Simple changes such as updating the layout of the ICP section of EHR to increase usability for clinical staff may be an effective solution to improve documentation on HDAT in line with the hospital policy.

In summary, high doses of antipsychotics are often necessary. Routine monitoring of HDAT is essential and it is important to maintain an awareness of changes within a service that may have an impact on the usual practice for monitoring of HDAT.

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

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