

Use of high dose antipsychotic medication

Graeme Yorston and Alison Pinney

An audit of antipsychotic prescribing was carried out on community and in-patient samples. A novel method of expressing total daily antipsychotic dose as a percentage of the *British National Formulary* maximum recommended dose was used. Of 226 patients who had been prescribed antipsychotics, 16 (7%) were found to be on high doses. Their medical notes were examined to ascertain whether the Royal College of Psychiatrists guidelines were being followed. Recommendations on ways in which practice could be improved were made and a re-audit was carried out. The number of patients receiving high doses fell to 6 (3%) out of 206.

Antipsychotic drugs have been used with a wide margin of safety since the early 1950s. Case reports of sudden cardiac deaths in otherwise fit and healthy individuals taking antipsychotic medication began to appear in the 1960s (Mehtonen *et al.* 1991). Nevertheless prescribed doses continued to increase over the next two decades despite a lack of supporting scientific evidence.

There have been concerns about the use of high doses of antipsychotic medication in particular and in December 1992 the College convened a panel of expert clinicians and pharmacists to review this area of practice, leading to the publication of a Consensus Statement on the use of high dose antipsychotics (Thompson, 1994) which questioned the rationale for their use. There was, however, an acceptance that in some circumstances the use of high doses may be justified and a list of safeguards was suggested to ensure that, if necessary, high doses are used as safely as possible. The Consensus Statement also encouraged local auditing of antipsychotic prescribing practice and a number of surveys have recently been published to this end (Warner *et al.* 1995; Krasucki & McFarlane, 1996; Morgan *et al.* 1996). However, few of the published studies have completed the audit cycle by attempting to introduce methods to improve practice and then re-auditing to check the effectiveness of these methods. The majority of published studies have examined only hospital in-patients and at a time of increased emphasis on community care the authors felt it important to examine in some

detail the prescribing of antipsychotics to patients in the community as well as those in hospital.

As this audit was designed to find usable and acceptable ways of improving prescribing practice we chose to calculate the total dose of antipsychotic in a novel way. Traditional methods of expressing total daily doses by using 'chlorpromazine equivalents' are fraught with difficulties (Dewan & Koss, 1995). The range of values of equivalent doses quoted in the literature sometimes differs by a factor of ten, conversion tables are necessary to make the required calculations and these may not be available in all clinical settings. It was therefore decided to calculate antipsychotic doses as a percentage of the maximum recommended (*British National Formulary* (BNF), 1995) dose.

For patients prescribed more than one preparation, these percentages were summed to give a total dose also expressed as a percentage of the BNF (1995) maximum. This method is similar to the 'ratio of maximum equivalent' proposed by Milton *et al.* (1995). Trifluoperazine has no recommended upper limit in the BNF (1995) so a dose of 45 mg was chosen for the purposes of this audit.

The study

Phase 1

The study was carried out at Amersham Hospital which has the main in-patient psychiatric facilities for South Buckinghamshire. There are currently two general acute wards and two old age psychiatry wards. Over a 14-week period the prescription charts for all patients on these wards were monitored on a daily basis by the ward pharmacist. For those patients prescribed antipsychotic medication, the name, age and gender were recorded as well as details of their psychotropic and other medication.

The community sample contained two groups of patients: those attending either of two depot clinics run by community psychiatric nurses (CPNs) and those at two small rehabilitation units (with 24 hour nursing cover but out of hours general practitioner (GP) medical cover).

For this group a cross-sectional survey was carried out with the same information being recorded for a single day.

The medical in-patient and out-patient notes and the nursing notes of those patients identified as receiving in excess of the BNF maximum recommended dose were examined for evidence of adherence to the College Consensus Statement guidelines. A 12-item checklist of the key recommendations from this document, with some additional ones from local guidelines, was drawn up to act as standard (listed in Table 1).

Phase 2

After the presentation of the results of Phase 1 to an audit meeting that was well attended by senior and junior medical staff and to several smaller CPN team meetings, a number of measures to improve adherence to College guidelines were introduced. These included:

- (1) Eighty per cent warning stickers – these were stuck onto the prescription charts by the pharmacist during routine monitoring to warn prescribers that the patient was nearing the upper limit of their antipsychotic dose range. Inadvertent high dose prescribing by use of additional p.r.n. medication was thus discouraged and baseline investigations could be carried out if there was a likelihood that the dose would have to be further increased.
- (2) Consultant endorsement stickers – the consultant body agreed that prescriptions for high doses should be counter-signed by a consultant within three days or cease to be valid. These stickers helped make it clear whether this had taken place.
- (3) A guideline checklist was produced which included sections on: indications for high dose therapy; relevant past medical his-

tory; antipsychotic (including p.r.n.) and other medication; electrocardiograms; full blood count; urea and electrolytes; liver function tests; consent form. (A copy of the checklist can be obtained from the author upon request.) Once attached to the prescription charts of patients identified as receiving high doses, it was designed to act as an *aide-mémoire* for nursing and medical staff to check that College and local guidelines were being applied.

- (4) On the back of this card was a pulse and blood pressure chart to encourage regular monitoring.
- (5) Prescribing guidelines were circulated to junior staff who were encouraged to phone the on-call consultant to discuss cases if high doses were proposed.

Following the introduction of these measures a re-audit was carried out to determine their effectiveness over a 16-week period.

Findings

Phase 1

The total number of patients prescribed antipsychotic medication was 226 (113 in-patients and 113 community and rehabilitation patients). Of the in-patient group 43% were men, 57% were women. Eleven (10%) were prescribed for regular administration doses that exceeded 100% of the BNF recommended maximum. A further 17 (15%) patients were prescribed p.r.n. medication which if given would have exceeded the BNF maximum. The majority of patients were prescribed low or moderate doses (Fig. 1).

Of the community and rehabilitation patients 69% were male and 28% female (gender not recorded in 3%). The age range of these patients is shown in Fig. 2. Five (4%) were identified as receiving high doses of antipsychotic medication.

Table 1. Adherence to prescribing guidelines (Phase 1)

Item from guidelines	Compliance with guidelines		
	No	Yes	NA
Prescription chart endorsed by consultant	14	2	
Dosage written in words and figures	16	0	
Written consent from the patient	16	0	
Reason for high dose stated explicitly in notes	14	2	
Discussion of medication at multi-disciplinary meeting	10	6	
Need for high doses reviewed every three months	10	3	3
Regular recording of pulse rate and blood pressure	16	0	
Baseline ECG	13	3	
Regular ECGs every three months	11	0	5
Baseline blood count and chemistry	6	10	
Regular blood chemistry every three months	10	3	3
Concurrent medication that may increase toxicity	7	9	

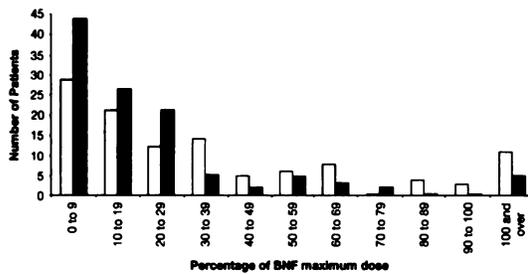


Figure 1. Range of antipsychotic doses prescribed (Phase 1). □, acute patients; ■, community and rehabilitation patients.

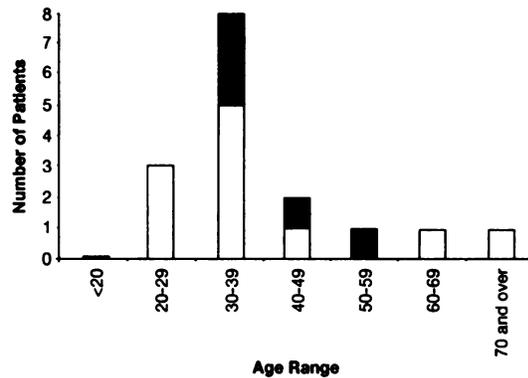


Figure 3. Age range of patients receiving high doses of antipsychotic medication (Phase 1). □, acute patients; ■, community and rehabilitation patients.

Overall the number of patients prescribed high doses was 16 (7%) of whom nine were male and seven female. The age distribution of these patients is shown in Fig. 3. The range of high doses used varied from 101% to 600% of the BNF recommended maximum (mean 191, s.d.=124).

Table 1 summarises the extent to which the guidelines were followed and Table 2 shows the combination of oral and depot medications used in these patients.

The combined set of results showed that out of a total of 203 patients six (3%) were prescribed high doses. Five of these remained on high doses from Phase 1, and only one patient was newly prescribed a high dose.

Phase 2

Re-audit showed that among the acute in-patients, 106 were prescribed antipsychotic medication, only one (0.9%) of these received a dose above the BNF recommended maximum. This was a statistically significant difference from Phase 1 (chi-squared test, $P < 0.01$). A further 12 (11%) patients were prescribed p.r.n. doses which if given would have exceeded the BNF maximum. In the community and rehabilitation group, 97 patients were prescribed antipsychotics, five (5%) of these received doses exceeding the BNF maximum. Adherence to guidelines had improved slightly but this did not reach statistical significance.

Comment

For the majority of patients relatively low doses of antipsychotic medication are prescribed. Similar regimes are used in acute in-patients and patients in the community. The range of doses used appears to be bimodal. Patients receiving antipsychotic medication (including high doses) come from a wide age range suggesting that it is important to include the elderly when addressing this issue in future audits. Of the small number of patients prescribed high doses of antipsychotics only one received this as a single preparation, for most of this group add-in oral therapy or combinations of oral preparations contributed to the high dose. There was poor adherence to the College recommendations and local guidelines, suggesting that the introduction of local guidelines had not been effective in improving practice and other measures were necessary to address the problem. This failure was not due to a lack of awareness by senior medical staff, for example

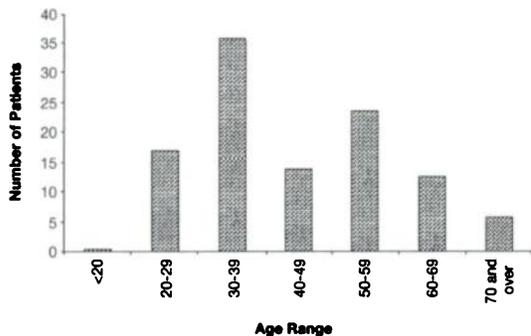


Figure 2. Age range of community and rehabilitation patients (Phase 1).

Table 2. Combinations of antipsychotic medication that contributed to high doses (Phase 1)

Form of medication	Number of patients
Depot only	1
Depot and one oral	9
Depot and two oral	3
Two oral	2
Four oral	1

one set of notes contained the statement: 'patient above BNF maximum doses therefore we need to implement high dose antipsychotic guidelines', yet there were still five items from the guidelines that were not carried out. It is important that junior staff receive sufficient training and that senior staff monitor their work.

As a result of this audit, and discussion of its findings locally, there was an improved awareness of the potential risks of using high dose antipsychotic medication among the medical staff (both junior and senior) and among the ward and community nursing staff. It led to a significant change in practice, most apparent on the acute wards. Three of the patients who had been taking high doses at Phase 1 of the audit were changed to clozapine monotherapy. Although this has had significant cost implications it is important to include the costs of electrocardiograms, blood testing and pulse and blood pressure monitoring in the traditional antipsychotic group when trying to evaluate the economic arguments about this increased use of clozapine. The biggest reduction in high dose prescribing was among those patients in the early stages of their admission to hospital and was due largely to increased use of benzodiazepines to bring severe agitation under control.

There was little change in the prescribing of p.r.n. medication. This was mainly due to the use of 'oral/IM' notation on prescription charts with a single maximum daily limit. Frequently the limit dose would be excessive if given intramuscularly. Although this issue had been highlighted after Phase 1 of the audit, the junior staff changed before Phase 2 was started. There is a continuing need for senior staff to emphasise these issues to juniors and to monitor prescribing practices.

It was noted that the recording of changes in medication was generally poor in the medical notes; even when the fact of a change was recorded, it was rare for the reasons for the change to be noted. This made it extremely difficult and potentially misleading to use the clinical notes alone when reviewing medication retrospectively. Prescription sheets were generally more accurately filled in, especially for regular medication, however discontinuation dates were often absent making it difficult to judge which prescriptions were concurrent. Although this audit was not designed to address these issues, it was the authors' impression that there was considerable room for improvement and we were pleased that over the course of the audit there were improvements in note keeping by junior medical staff.

Raised awareness of potential problems with antipsychotics among community nursing staff led to improved monitoring of home depots given by CPNs. Prior to the audit there was no central register of these patients or records of their

medication, making it very difficult to audit this important group. After the audit, one community mental health team had implemented such a register and there were plans to do so by the other community mental health team. There was also raised awareness of the importance of additional oral medication prescribed by GPs and it was our impression that the recording of this information improved over the course of the audit.

The use of 'percentage BNF maximum' as an expression of total antipsychotic dose proved easy to understand and to calculate. Copies of the BNF were widely available and as this publication is updated twice yearly, it was felt that there was less chance of relevant information becoming out of date. The correlation between percentage BNF maximum dose and chlorpromazine equivalents was generally close, though with some important exceptions (a detailed analysis of this is in preparation).

This audit led to significant improvements in the practice of antipsychotic prescribing and goes some way to disprove the belief (Sellu, 1996) that clinical audit does not lead to change.

Acknowledgements

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*Graeme Yorston, Senior Registrar in Old Age Psychiatry, DMHE Community Team, South Buckinghamshire NHS Trust, Shrubbery Road, High Wycombe, Buckinghamshire HP13 6PS and Alison Pinney, Dispensary Manager, Amersham Hospital, Whielden Street, Amersham, Bucks HP7 0JD

*Correspondence