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Rapid Tranquillisation
A Survey of Emergency Prescribing in a General Psychiatric Hospital

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Rapid tranquillisation – giving a psychotropic to control behavioural disturbances – is common in medical practice, yet few surveys describe its use in psychiatric populations. Over five months, 102 incidents, involving 60 patients, were retrospectively surveyed. Patients most often involved were young white men. The commonest diagnosis was affective disorder (manic phase) (39%) followed by schizophrenia (33%). Fifteen patients were involved in 57% of the incidents. The majority of incidents involved injury to people or damage to property. The most frequently used drugs were diazepam and haloperidol, alone or in combination. Droperidol, chlorpromazine, sodium amytal and paraldehyde were rarely used. Diazepam alone or in combination with haloperidol delivered intravenously was most rapidly effective and was associated with greatest staff satisfaction. Serious side-effects were rare.

Violence by psychiatric patients, once thought to be uncommon, has increased (Tardiff & Sweillam, 1980; Haller & Deluty, 1988; Noble & Rodger, 1989). Violent patients present a risk to themselves and others, and thus require swift, safe and effective treatment which allows subsequent evaluation and appropriate management. Some patients, not amenable to psychological or behavioural strategies, need emergency pharmacological treatment.

Rapid tranquillisation (RT) – giving psychotropic medication to control behavioural disturbance (Ellison *et al*, 1989) – is one of the commonest types of emergency medication in medical practice, yet has not been investigated systematically. There have been several reviews on this topic (Dubin, 1988; Sheard, 1988; Ellison *et al*, 1989; Goldberg *et al*, 1989), and many trials, open and controlled, of antipsychotic and sedative drugs (Neff *et al*, 1972; Lerner *et al*, 1979; Resnick & Burton, 1984; Modell *et al*, 1985; Tuason, 1986; Clinton *et al*, 1987) but few studies have evaluated actual practice. Rapp (1987) surveyed emergency medication on an acute admission ward and found marked differences in drug choice between wards, without clear therapeutic rationales. He suggested a need for a prospective study to relate actual measures, drugs and dosages used, to outcome.

Little is known of the frequency of RT in the general psychiatric setting, the context in which it is used, or the extent to which other measures are deployed before resorting to injectable medication for violent or uncooperative patients.

To our knowledge this is the first audit of RT in a postgraduate psychiatric teaching hospital; it describes the patients and the incidents, and attempts to assess the effectiveness of the various drug regimes employed.

Method

The hospital (see Noble & Rodger, 1989), located in south London, is on two sites. It is a postgraduate teaching hospital with many special units which also provides a comprehensive in-patient service for a local catchment population of 140 000. In 1987 there were 190 general psychiatric beds and 190 special-unit beds, as well as a 24-hour walk-in psychiatric emergency clinic. Incidents examined were drawn from the entire hospital, excluding the interim secure unit.

Patients were included in the survey if they had received an injection of psychotropic drug from medical or nursing staff as an acute treatment.

Over the 160-day study period, daily contacts were made with the duty doctor and charge nurses on all wards by one of the researchers (LSP). A computer record of all emergency calls and their location in the hospital was perused daily and all calls followed up by LSP. Doctors and nurses who had given injections were asked to complete a questionnaire about the incident within 48 hours. Two-thirds of respondents were doctors, one-third were nurses.

The questionnaire (rapid tranquillisation questionnaire, RTQ) is based on clinical observation and a pilot study. It has 89 items divided into sections describing the patient, the incident, an aggression/agitation scale, and the treatments used. The aggression scale is scored from 1 to 10, where 1 is deeply asleep and difficult to rouse and 10 is wildly assaultive, using a weapon, and needing restraint. (Copies of the RTQ are available from LSP on request.)

Results

Over the 160 days, 102 incidents were reported. There were no incidents on 96 days. Five incidents occurred at night or on weekends and went unreported. The response rate was 95%. To ensure independence of events in the statistical analysis, only the first incident per patient was included

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($n = 60$). For descriptive purposes, frequencies from all 102 incidents are included.

Patient details

Fifteen patients were involved in 57% of incidents. The largest number of incidents involving any one patient was ten (two patients). Two-thirds of the patients were men, three-quarters were white, and a quarter Afro-Caribbean. Most (88%) were in-patients on a section of the Mental Health Act. Incidents occurred mainly on the locked unit or in the emergency clinic. The majority of patients (86%) had a history of violence; 65% had been violent in the 24 hours preceding the incident.

Involuntarily and informally treated patients did not differ in terms of degree of struggle while being injected, or need for a second injection.

No significant differences were found between white and Afro-Caribbean patients in terms of sex, age, build, history of violence, injury to people or damage to property, and need for a second injection. A higher proportion of Afro-Caribbean than white patients were diagnosed schizophrenic (Fisher's exact test, $P < 0.004$).

Patients with a large build (73 incidents) were more likely to have a second injection than those judged smaller in size (Fisher's exact test, $P < 0.08$). There were no differences between men and women in terms of diagnosis, injury to others, restraints needed, requirement for further medication, or need for further treatment after injection.

The diagnosis was made by the treating nurse or doctor in accordance with ICD-9 (World Health Organisation, 1978) and was the working diagnosis at the time of the injection. The commonest diagnoses were affective disorder (mania) (39%) followed by schizophrenia (33%).

Nearly half the patients were not regularly receiving medication. The most common oral antipsychotic prescribed was chlorpromazine followed by haloperidol. Few were on depot medication. In 29 (28%) of the recorded incidents the patient involved had received parenteral medication for behavioural disturbance in the preceding 24 hours. Twenty-six patients had not received such an injection during the current admission.

In 51 incidents (50%) the patient's speech was assessed as normal in rate, form and content, but verbal threats were directed at staff. In 14 incidents (14%) speech was mute or incoherent. In 37 (37%), speech was either delusional in content or disordered in rate and form. Mood was described as hostile in 68 events (67%). The other most common mood reported in the patient was anxiety or fear (12%).

The incident

In a majority of incidents (62%) injury to people or damage to property was minor. However, in a third of incidents more serious damage was incurred. This included breaking furniture, smashing windows or attacking the fabric of the building. In 10% of incidents people received moderate (large bruises/lacerations) to severe (needing medical attention) injuries.

The alternative ways in which aggressive patients were managed included psychological (e.g. talking down, distraction) (87%), behavioural (e.g. seclusion, segregation) (33%), and therapeutic physical restraint (64%).

Doctors and nurses were equally likely to employ any of the treatment measures, and there was no difference between them in terms of the patient accepting oral medication. Use of psychological or behavioural methods did not increase the likelihood of the patient accepting oral medication. There was no difference between diagnoses and willingness or refusal to accept oral medication, neither did acceptance of oral medication affect the need for further, physical methods of behavioural control.

The average number of staff required at the scene to restrain the patient was six. In 28 incidents (28%) there was no struggle while the medication was given. In 37 (37%) there was minor or initial struggle, and in a further 37 (37%) there was continuous struggle throughout.

Agitation scores between 5 and 10 related to increasing uncooperativeness. Most patients were in this range before the incident. In 5% of incidents, the patients were considered cooperative immediately before injection.

The psychotropic drugs

In 53 of the incidents, the first drug was given intravenously, while in 49 it was given intramuscularly. In 42 incidents a second drug was given, intravenously in 30 instances, intramuscularly in 10, and orally in 2. In 5 incidents a third drug was given immediately after the incident. Within an hour of these first injections, 19% of the incidents were followed by a second injection of one drug, and 6% by injections of two drugs.

Patients receiving only one drug at first were significantly more likely to require second injections (Fisher's exact test, $P < 0.03$).

For the first injections, drugs were given in the following order of frequency: diazepam, haloperidol, chlorpromazine, droperidol, paraldehyde, amytal, lorazepam, and nitrazepam. The only difference at the second injection was that droperidol was used more often than chlorpromazine. The most common route was intravenous. Mean drug dosages at the first injection for the most commonly used drugs were: diazepam (DZ) 27 (range 10–80) mg, haloperidol (HDL) 22 (range 10–60) mg, droperidol (DRO) 14 (range 10–20) mg, chlorpromazine (CPZ) 162 (range 50–400) mg. At the second injection dosages were: DZ 21 (range 10–40) mg, HDL 26 (range 20–40) mg, DRO 17 (range 10–20) mg, CPZ 200 (range 0) mg.

Figure 1 plots the median aggression score (with interquartile ranges) over time by drug given. The median aggression score declined more rapidly where drugs were given intravenously. Analysis of variance indicated that the type of drug given (antipsychotic and sedative, and sedative more than antipsychotics alone) and route used (intravenous medication response more rapid than intramuscular) accounted for the rapidity of response. Time taken to give all drugs on the first occasion was less than 5 minutes in 72% of cases, and less than 15 minutes in 24%. Physical restraints were removed within 5 minutes in 62%

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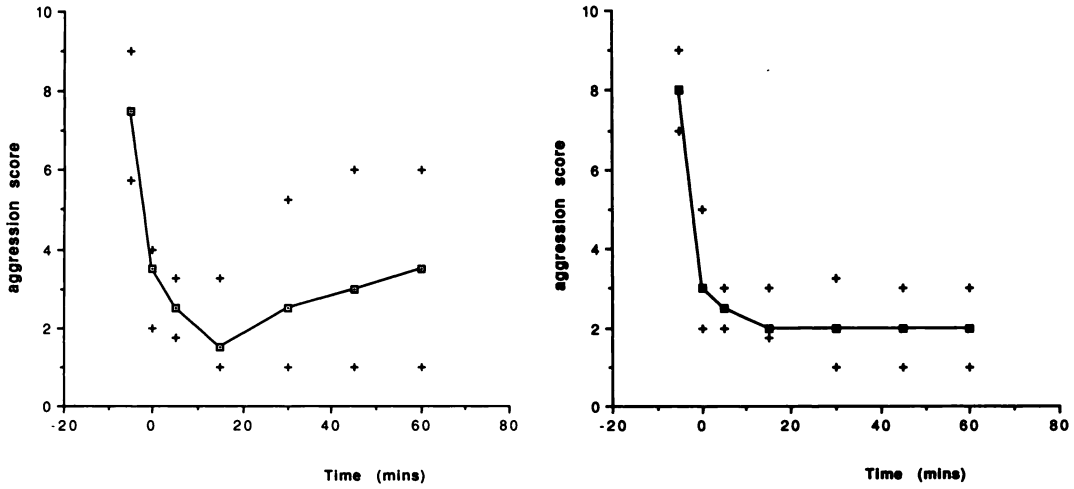


Fig. 1 For medication ((a) diazepam, (b) diazepam and haloperidol in combination) given *intravenously*, median aggression scores and 25% and 75% interquartile ranges (+) for all first incidents are shown (first injections) 5 minutes before injection, at the time of injection, and 5, 15, 30, 45 and 60 minutes after injection.

of cases, within 15 minutes in 23%, and in 18% up to an hour after injection.

In 26% of incidents a second injection was required. Similar numbers of staff were required to restrain the patient for this episode as for the first. Following all medication, further physical methods to control behaviour were still required for 10% of patients. Nurses were more likely than doctors to use other physical measures (Fisher's exact test, $P<0.003$).

There were no or minor local complications in 70% of patients receiving an intravenous injection. In 30% of cases minor bruising, pain or extravasation was reported.

Respiratory complications were reported in two incidents (2%). An extremely disturbed unmedicated young man, naive to medication, had a cardiorespiratory arrest after being given an intravenous bolus of 60 mg haloperidol and 80 mg diazepam over 10 minutes. Another young man collapsed with shallow respirations after 10 ml intramuscular paraldehyde. Cardiovascular complications were reported in three cases (3%) and these, apart from that associated with the case of cardiorespiratory arrest described above, were transient tachycardia after intramuscular chlorpromazine in a young woman and mild hypotension after 5 mg intravenous diazepam and 100 mg chlorpromazine syrup orally in a young woman. A 55-year-old man addicted to lorazepam became acutely confused after being given 40 mg haloperidol, 2.5 mg lorazepam, and diazepam 10 mg intravenously.

Physical observations were specifically requested after medication in 57% of cases. Doctors were more likely to arrange physical observations (Fisher's exact test, $P<0.0002$).

Dissatisfaction with the method used was expressed by 18% of staff, while 35% were moderately satisfied, and 48% completely satisfied. Most (75%) felt the drug given was the therapeutic agent. Dissatisfaction was greater if further physical methods had to be used (Fisher's exact test, $P<0.0008$). Greatest satisfaction was expressed where a combination of an antipsychotic and a sedative had been used (Fisher's exact test, $P<0.03$).

Discussion

This survey arose out of a perceived mismatch between our experience of RT and the paucity of information about its use in the general psychiatric setting.

Two potential criticisms of the study must first be addressed. The survey relies on clinician raters to make repeated retrospective assessments of aggression, using a scale contained within the RTQ. Similar scales evaluated by other researchers have shown reliability between untrained raters (Yudofsky *et al*, 1986; Palmstierna & Wistedt, 1987; Brizer *et al*, 1987) for rating overt aggression. In this case, ratings were supported by a variety of incident severity measures, including degree of struggle, number of staff required to restrain, degree of injury inflicted, time until restraints were removed, and need for further medication. Randomly selected patient questionnaires and ward notes of continuous observations were in close agreement. Staff found the scale easy to use, with good face validity.

Incidents were not sampled as they occurred. Errors in recall were minimised by asking staff to complete the questionnaire within 48 hours. Furthermore, each ward and duty doctor was contacted personally, so bias due to under-reporting was limited (Haller & Deluty, 1988). Staff hardest to contact (night staff) were least cooperative in completing questionnaires,

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and this emphasises the need for personal follow-up in investigation of psychiatric emergencies/violent incidents.

This study documented 102 episodes of RT over 160 days. Over the same period, the Maudsley Violent Incident Register (Noble & Rodger, 1989) recorded 1217 incidents on both hospital sites (excluding the interim secure unit), most involving actual assaults on staff. RT was used in 8% of all incidents. Clearly, it is not overused.

Two distinct groups of patients were identified: those who received one or two injections in the acute phase of their illness and those patients who received RT more than once, presenting different management issues in terms of their tolerance to routine doses of medication and long-term management of aggression. In another survey of violent behaviour (Cooper *et al*, 1983) and the use of medication 'as required' in a locked unit (McLaren *et al*, 1990), small subgroups of repeatedly violent patients were similarly identified.

Patients had been violent or self-destructive in over half of incidents in the 24 hours before RT. Forced injection appeared to be used after a sustained escalation in aggressive behaviour rather than as a response to a single incident.

Many patients were not receiving regular antipsychotic medication. Undertreatment may lead to poor control of psychotic symptoms, high arousal, and aggressive behaviour. Yesavage (1982) found significant correlations between low serum levels of thiothixene and violent behaviour in 58 schizophrenic patients.

Before the use of RT, other treatment measures included psychological techniques, seclusion (Angold, 1989), and therapeutic physical restraint. None of these measures increased the likelihood of the patient accepting oral medication, nor did they appear to diminish the need for RT. In McLaren *et al*'s (1990) survey of the use of medication 'as required' on a locked ward, 20% of patients still needed enforced medication after psychological or behavioural strategies were used and oral medication was given.

Most patients in our survey received a single drug at the first injection. Doctors mainly chose haloperidol or diazepam alone or intravenously in combination. The combination was used only by doctors, as the intravenous route is unavailable to nurses.

Dubin (1988) and Goldberg *et al* (1989) recommend combinations of haloperidol and diazepam. They suggest these drugs act synergistically, reducing the amount of each drug required. Staff satisfaction was highest where this combination was used, and patients who received it were less likely to require a second injection. This survey cannot make firm comparisons between effectiveness of the different drugs used. There are small numbers in some patient groups, treating staff were not blind to the drug given, and confounding factors such as regular medication and diagnosis were not controlled. Nevertheless, intravenous sedation with diazepam alone or in combination with haloperidol appeared to be more predictably and rapidly effective than other drugs given intramuscularly.

A wide range of drug dosages were given. Average doses of all drugs used exceeded recommendations in the *British National Formulary* (1989) for treatment of acute disturbance. The average dose of haloperidol (22 mg) was nearly three times that reported by Clinton *et al* (1987) in 136 accident and emergency patients.

Intravenous delivery of medication was popular with medical staff. Difficulties in obtaining venous access were not reported. The need for further physical measures (seclusion/restraint) is evidence of pharmacological failure. This occurred in only a small proportion of incidents, all associated with the intramuscular route.

Complications were rare. Some were potentially serious and related to idiosyncratic drug reactions, predictable side-effects/interactions, and overmedication. The majority could be prevented with adequate training in the use of RT. Oversedation and undertreatment can both be avoided if small bolus doses are used, titrating amount given with effect on target symptoms (based on overt aggression rather than psychotic symptoms). Once the patient is quiet and the immediate emergency contained, a full assessment can take place of the patient's state, events leading to the incident, injuries to people or damage to property. Regular medication may need to be increased and special observations instituted. Sheard (1988) has reviewed the long-term pharmacological management of aggression.

In this survey, RT was not overused, but was a last resort in those patients failing to respond to less invasive psychological and behavioural measures. Further research into RT could be aimed at delineating the safest and most effective medication, dosage and mode of delivery in a double-blind, controlled study. Further work could also examine why some patients refuse oral medication and assess the efficacy of non-pharmacological methods of behavioural control. It is possible that patients receiving RT constitute a subgroup in terms of diagnosis and severity of illness, and merit early identification and vigorous treatment before they harm themselves or others.

References

ANGOLD, A. (1989) Seclusion. *British Journal of Psychiatry*, **154**, 437–444.

https://doi.org/10.1192/bjp.160.6.831 Published online by Cambridge University Press

BRITISH NATIONAL FORMULARY (1989) *British National Formulary, Number 16*. London: The British Medical Association and The Pharmaceutical Press.

BRIZER, D., CONVIT, A., KRAKOWSKI, M., *et al* (1987) A rating scale for reporting violence on psychiatric wards. *Hospital and Community Psychiatry*, **38**, 769–770.

CLINTON, J. E., STERNER, S., STELMACHERS, Z., *et al* (1987) Haloperidol for sedation of disruptive emergency patients. *Annals of Emergency Medicine*, **16**, 319–322.

COOPER, S. J., BROWNE, F. W. A., MCCLEAN, K. J., *et al* (1983) Aggressive behaviour in a psychiatric observation ward. *Acta Psychiatrica Scandinavica*, **68**, 386–393.

DUBIN, W. R. (1988) Rapid tranquillisation: antipsychotics or benzodiazepines. *Journal of Clinical Psychiatry*, **49** (suppl. 12), 5–12.

ELLISON, J., HUGHES, D. & KIMBERLY, A. W. (1989) An emergency psychiatry update. *Hospital and Community Psychiatry*, **40**, 250–260.

GOLDBERG, R. J., DUBIN, W. R. & FOGEL, B. S. (1989) Review. Behavioural emergencies, assessment of psychopharmacologic management. *Clinical Neuropharmacology*, **12**, 233–248.

HALLER, R. M. & DELUTY, R. H. (1988) Assaults on staff by psychiatric inpatients, a critical review. *British Journal of Psychiatry*, **152**, 174–179.

LERNER, Y., LWOW, E., LEVITIN, A., *et al* (1979) Acute high dose parenteral haloperidol treatment of psychosis. *American Journal of Psychiatry*, **136**, 1061–1065.

MCLAREN, S., BROWNE, F. W. A. & TAYLOR, P. J. (1990) A study of psychotropic medication given 'as required' in a regional secure unit. *British Journal of Psychiatry*, **156**, 732–735.

MODELL, J. G., LENOX, R. H. & WEINER, S. (1985) Inpatient clinical trial of lorazepam for the treatment of manic agitation. *Journal of Clinical Psychopharmacology*, **5**, 109–113.

NEFF, K., DENNY, D. & BLACHLY, P. (1972) Control of severe agitation with droperidol. *Diseases of the Nervous System*, **33**, 594–597.

NOBLE, P. & RODGERS, S. (1989) Violence by psychiatric in-patients. *British Journal of Psychiatry*, **155**, 384–390.

PALMSTIERNA, T. & WISTEDT, B. (1987) Staff observation aggression scale, SOAS. Presentation and evaluation. *Acta Psychiatrica Scandinavica*, **76**, 657–663.

RAPP, M. S. (1987) Chemical restraint. *Canadian Journal of Psychiatry*, **32**, 20–21.

RESNICK, M. & BURTON, B. J. (1984) Droperidol vs. haloperidol in the initial management of acutely agitated patients. *Journal of Clinical Psychiatry*, **45**, 298–299.

SHEARD, M. H. (1988) Review: clinical pharmacology of aggressive behaviour. *Clinical Pharmacology*, **11**, 483–492.

TARDIFF, K. & SWEILLAM, A. (1980) Assault, suicide and mental illness. *Archives of General Psychiatry*, **37**, 164–169.

TUASON, V. B. (1986) A comparison of parenteral loxapine and haloperidol in hostile and aggressive acutely schizophrenic patients. *Journal of Clinical Psychiatry*, **47**, 126–129.

WORLD HEALTH ORGANIZATION (1978) *Mental Disorders: Glossary and Guide to their Classification in Accordance with the Ninth Revision of the International Classification of Diseases* (ICD-9). Geneva: WHO.

YESAVAGE, J. A. (1982) Inpatient violence and the schizophrenic patient: an inverse correlation between danger related events and neuroleptic levels. *Biological Psychiatry*, **17**, 1331–1337.

YUDOFSKY, S. C., SILVER, J. M., JACKSON, W., *et al* (1986) The overt aggression scale for the objective rating of verbal and physical aggression. *American Journal of Psychiatry*, **143**, 35–39.

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