The use of sedative-hypnotic drugs in a university teaching hospital

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We reviewed the charts of 476 patients admitted to a university teaching hospital to determine whether sedative-hypnotic drugs (SHDs) were being used excessively and to examine the use of SHDs as hypnotics. The frequency of medical and surgical indications for barbiturates and benzodiazepines or other minor tranquillizers as well as the use of such drugs were compared among different groups of patients and specialty wards. Of the patients 29% had a regular order and 40% had a PRN order; only 77% of the PRN orders were administered. A total of 215 patients (45%) received an SHD during their hospital stay, and 160 (34%) received the drug as a hypnotic. Medical indications accounted for 49% of the regular orders but only 2% of the PRN orders; moreover, 89% of all the PRN orders were for insomnia. On average, patients receiving SHDs as hypnotics were older ($p < 0.05$) and stayed longer in hospital ($p < 0.01$) than those who did not; however, no patient on the geriatric or pediatric ward received an SHD as a hypnotic during the hospital stay. The differences in use between patient groups may have been influenced by orientation of ward staff. Physicians should review their rationale for prescribing hypnotics and avoid routine orders on admission.

Revue des dossiers de 476 sujets entrés à un hôpital universitaire, afin de savoir si on y prescrit trop de sédatifs et de somnifères (S-S) et d'examiner leur emploi comme somnifères. Mise en regard de la fréquence des indications (médicales et chirurgicales) et de l'emploi des barbituriques, benzodiazépines et autres tranquillisants légers chez divers groupes de malades et dans divers services spécialisés. Pour 29% des malades on a rédigé une ordonnance à suivre telle quelle et pour 40% "au besoin". Dans ce dernier cas le médicament prescrit n'a été donnée que 77% des fois. De tous les sujets 215 (45%) prennent un S-S durant leur séjour à l'hôpital, et 160 (34%) comme somnifère. Les indications médicales rendrent compte 49% des ordonnances à suivre telles quelles mais seulement 2% de celles qu'on doit suivre "au besoin". De celles-ci, 89% sont faites en prévision d'une insomnie éventuelle. En moyenne, les malades à qui on a fait prendre des S-S comme somnifères sont plus âgés ($p < 0,05$) et sont hospitalisés plus longtemps ($p < 0,01$) que les autres; cependant on n'a pas donné de somnifères dans les services de gériatrie et de pédiatrie. Ces différences d'emploi selon les groupes de malades reflètent peut-être la philosophie du personnel soignant. On conseille au médecin de repenser les indications des somnifères et de ne pas les prescrire systématiquement à l'arrivée du malade.

In recent years it has been suggested that sedative-hypnotic drugs are being prescribed excessively. North American[1-3] and European[4,5] studies have demonstrated high rates of use in general population surveys. Studies in the 1960s and early 1970s described an increasing volume of prescriptions,[6] but more recent surveys have shown a reversal of this trend.[7,8]

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The frequent prescription of SHDs for patients in hospital has long been recognized[9-16] and the appropriateness questioned.[17] Some authors have criticized the methods used in these studies, particularly those that emphasize the frequency of use without information on the indications.[18] This criticism is important since these agents are prescribed for various medical and psychiatric problems.

In this study we determined the frequency of both medical and surgical indications for SHDs in a general hospital. Most criticisms of the excessive use of SHDs pertain to their use as anxiolytics and hypnotics as opposed to their medical uses.[17] Since it has been suggested that hypnotic dependence often starts when SHDs are prescribed during a hospital stay,[19] we examined the use of these agents as hypnotics. In addition, we compared the prescribing patterns of different specialists and determined the patient and admission variables associated with a high probability of taking hypnotics in hospital.

Methods

The survey was carried out at University Hospital, Saskatoon, which is a tertiary care facility. Starting on Jan. 1, 1986, we selected the first 120 consecutive patients admitted to the medical, surgical and psychiatric wards and the first 40 consecutive patients admitted to the obstetrics and gynecology, pediatric and geriatric wards.

For the purposes of the study an SHD was defined as any benzodiazepine, barbiturate or other minor tranquillizer in the hospital formulary. The hospital records were reviewed for patient demographic information, clinical information and prescription-related details, including the indication for prescribing an SHD. Prescription-related details were obtained from the computerized pharmacy records inserted in each chart and from the physicians' orders. This method allowed us to verify both the prescription and the administration of each agent. The indication was obtained from the physicians' and nurses' notes. In some cases no clear statement concerning the indication could be found in the notes. However, in many of these instances the indication was obvious from the context (e.g., a large dose of diazepam prescribed just before a minor surgical procedure). For all other cases the indication was recorded as unknown.

We used Yates's corrected chi-squared test for analysis involving discrete variables and Student's *t*-test for computations involving interval variables.

Results

We reviewed 476 patient charts. The demographic information by ward is shown in Table 1.

Table 1: Age and sex of study population by department

Department	No. of patients (n = 476)	Mean age, yr	Sex, %	
			Men	Women
Medicine	123	55.3	50	50
Surgery	116	45.3	65	35
Psychiatry	114	33.3	56	44
Obstetrics and gynecology	43	35.2	0	100
Geriatrics	41	81.1	41	59
Pediatrics	39	1.9	54	46

Table 2: Prescription-related data for sedative–hypnotic drugs (SHDs) by department

Department	No. (and %) of patients*				
	Regular order	PRN order	PRN dose administered	SHD given in hospital	SHD given as hypnotic
Medicine	41 (33)	45 (37)	34 (76)	58 (47)	43 (35)
Surgery	36 (31)	60 (52)	38 (63)	56 (48)	38 (33)
Psychiatry	44 (39)	76 (66)	73 (94)	81 (71)	73 (64)
Obstetrics and gynecology	10 (23)	8 (19)	3 (38)	11 (26)	6 (14)
Geriatrics	2 (5)	0 (0)	NA	2 (5)	0 (0)
Pediatrics	7 (18)	1 (3)	1 (100)	7 (18)	0 (0)
Total	140 (29)	192 (40)	149 (78)	215 (45)	160 (34)

*NA = not available.

SHDs were administered to 45% of the patients (Table 2). The frequency with which these agents were prescribed differed among the wards; 71% of the psychiatric patients received one or more SHDs during their stay. These patients were administered significantly more SHDs than nonpsychiatric patients ($\chi^2 = 26.7$, $p < 0.0001$). The geriatric patients were given significantly fewer SHDs than the other patients ($\chi^2 = 36.6$, $p < 0.0001$).

Patients often received both a regular dose and a PRN dose of an SHD. The frequency with which an SHD was prescribed as needed and administered differed among the wards (Table 2). The psychiatric ward administered significantly more orders than the nonpsychiatric wards ($\chi^2 = 19.6$, $p < 0.0001$), and the obstetrics and gynecology ward administered significantly fewer orders than the other wards ($\chi^2 = 5.7$, $p < 0.05$).

The indications are shown in Table 3. With the exclusion of the psychiatric ward 71% of the regular orders were for medical problems. In contrast, on the psychiatric ward 94% of the regular orders were for psychiatric indications. Of the PRN orders 97% were for psychiatric problems, of which insomnia accounted for 91%.

None of the patients from the pediatric or geriatric wards received an SHD as a hypnotic. Patients who did receive a hypnotic were significantly older than those who did not ($p < 0.05$) (Table 4). The hospital stay was significantly longer for patients who received a hypnotic than for those who did not ($p < 0.01$) (Table 5). No differences in sex were found between those who did or did not receive

Table 3: Indications for SHD use

Indication	Type of order; no. (and %) of patients	
	Regular	PRN*
Medical		
Premedication	59 (42)	0 (0)
Epilepsy	4 (3)	0 (0)
Muscle spasm	3 (2)	1 (1)
Adjunct to analgesia	3 (2)	2 (1)
Subtotal	69 (49)	3 (2)
Psychiatric		
Insomnia	35 (25)	174 (89)
Generalized anxiety	17 (12)	8 (4)
Panic attack	4 (3)	1 (1)
Agitation	5 (4)	8 (4)
Subtotal	61 (44)	191 (98)
Unknown	10 (7)	2 (1)

*Four patients received SHDs for two different indications.

Table 4: Age of patients and hypnotic use by department

Department	Mean age (and standard deviation [SD]), yr		p value*
	Received hypnotic	Did not receive hypnotic	
Medicine	56.3 (13.3)	54.8 (18.6)	NS
Surgery	53.1 (17.2)	41.5 (23.6)	< 0.01
Psychiatry	37.9 (15.8)	25.1 (15.7)	< 0.01
Obstetrics and gynecology	61.8 (15.3)	30.8 (14.9)	< 0.01
Geriatrics	NA	81.1 (7.2)	NA
Pediatrics	NA	1.9 (3.5)	NA
Total	47.4 (17.7)	41.7 (27.9)	< 0.05

*NS = not significant.

Table 5: Duration of hospital stay and hypnotic use by department

Department	Mean duration (and SD), d		p value
	Received hypnotic	Did not receive hypnotic	
Medicine	14.2 (16.1)	9.7 (8.9)	< 0.05
Surgery	14.0 (11.2)	8.5 (9.5)	< 0.01
Psychiatry	27.7 (25.8)	19.8 (19.2)	NS
Obstetrics and gynecology	13.2 (6.5)	6.6 (8.4)	NS
Geriatrics	NA	17.9 (7.8)	NA
Pediatrics	NA	11.5 (25.1)	NA
Total	20.3 (21.2)	11.6 (14.2)	< 0.01

a hypnotic. Of the PRN orders for hypnotics 40% were written at admission and 72% within 24 hours after admission. In only two instances did the prescribing physician indicate the circumstances under which a PRN hypnotic should be administered.

Discussion

The results show the importance of examining the indications for prescribing drugs in surveys of use. Although PRN orders for SHDs were almost exclusively prescribed for psychiatric indications, almost half of the regular orders were for medical indications. Thus, we should not assume that all SHD use reported in hospital-based surveys is for psychiatric indications.

The most common psychiatric indication was insomnia. Although the rates of SHD use in other countries have varied considerably, they are generally comparable to the rate reported here (34%). Perry and Wu[16] found that a hypnotic was prescribed for 46% of medical inpatients and that 31% actually received one at least once; the equivalent figures for surgical patients were 96% and 88% respectively. In Boston 58% of patients admitted to one of three general hospitals received a hypnotic,[20] and in Glasgow 32% of general medical patients received one at least once during their hospital stay.[12]

The use of SHDs as hypnotics in our study appears to be similar to that reported from many other hospitals in North America and Britain. Psychiatric patients accounted for the highest rate of hypnotic use; this is in agreement with the findings of Johnson and Clift,[19] who reported that the frequency of hypnotic use was 86% among psychiatric patients, compared with 58% among medical patients and 32% among surgical patients. Other studies have reported rates among psychiatric patients of 54% to 82%.[21-23]

It is not possible to determine the appropriateness of the indications from a retrospective study. Our study does, however, raise questions about the high rate of PRN orders and the increase in use of hypnotics with increasing age and duration of stay. Perry and Wu[16] suggested that PRN orders are sometimes written routinely. In their study they found that PRN orders were given for 96% of the surgical patients; only those with undiagnosed abdominal pain were excluded. The frequency of PRN orders in our study was much less, but the timing suggested that such orders are sometimes a routine part of admission.

Physicians might be expected to continue prescribing hypnotics for patients who were taking them before admission, but it would seem logical to prescribe these drugs on a regular rather than a PRN basis. A PRN order suggests that the physician is unsure either that the patient will ever require a hypnotic or that the drug will be required every night. It would seem prudent, at least in the former situation, to delay the decision until insomnia actually occurs. A further 32% of PRN orders were made within 24 hours after admission, presumably because many of the patients could not sleep on the first night. The anxiety created by admission to hospital and the unfamiliar surroundings can often result in insomnia. For many patients reassurance by the medical and nursing staff may be more appropriate than pharmacotherapy.

Our chart review revealed that many PRN orders were written by the junior house staff, who may have a vested interest in having their patients sleep. Such an order reduces the likelihood of their having to assess the need for hypnotics in the middle of the night. This was the most frequently reported reason in a recent survey of house staff.[24] In general, the final decision to administer a hypnotic is left to the nursing staff. Morrison and Mayfield[15] reported that nurses from the same unit differed markedly in their understanding of what a PRN order meant; thus, some nurses gave the hypnotic to all patients at bedtime, whereas others administered it only to those who requested it and had insomnia on the night in question. The physicians' orders in our survey rarely gave specific instructions indicating when to administer the drug; this may have contributed to the differing rates of administration between wards.

The second area of concern is the strong association between hypnotic use and the length of hospital stay. The patients who stayed longer may have had more serious illnesses that were associated with insomnia. Although this explanation is plausible for psychiatric patients, whose insomnia may be a symptom of the illness, there is no *a priori* reason why patients with serious medical problems should be more likely to require hypnotics. We propose that the duration of the hospital stay is a risk factor for receiving a hypnotic. Arbitrary use of such drugs has been shown by Perry and Wu,[16] who found no correlation between administration and patient requests, previous use by the patient or recorded indications of sleep disturbance.

Many population studies have shown increased use of hypnotics among the elderly.[7,25] Comparable data from Saskatchewan, where our study was performed, have shown a similar pattern (James Blackburn: personal communication, 1989). The elderly sleep less at night than the general population,[26] and it has been suggested that prescribing hypnotics to the elderly is frequently an attempt to "treat" a natural symptom of aging.

It is probably not surprising that we found an

increased use of hypnotics with increased age. However, none of the 41 patients in the geriatric ward were given a hypnotic during their hospital stay. The geriatric unit has a departmental policy of strictly regulating the use of such drugs. Considerable time is spent educating nurses and house staff about the indications for SHDs, the side effects and the alternative nonpharmacologic interventions for insomnia. Consultants are involved in a weekly review of all SHDs prescribed on the ward. Asthana and Sood[27] reported that although 25% of patients had been taking SHDs when admitted to this unit, only 5% were given these drugs at discharge.

It may be argued that patients on the geriatric ward are being denied a helpful treatment. However, Bayer and Pathy[28] reported that a combination of education and adjustment of nonhypnotic medication (e.g., prescription of a sedative-antidepressant at night) satisfied 10% of geriatric patients who had requested hypnotics, and a placebo satisfied a further 55%. Mulligan and O'Grady[23] reported that it was possible to reduce the use of hypnotic tablets from 854 to 4 per week for 102 psychogeriatric patients through education of staff and patients; they noted a subsequent improvement in the patients' physical and psychologic well-being.

Conclusion

We recommend that physicians involved in the care of patients in hospital review their rationale for prescribing hypnotics. The practice of routinely writing orders for such drugs on admission should be discouraged. Most PRN orders will likely be administered. Every effort should be made to discontinue hypnotic therapy before discharge. Particular effort should be made to avoid the inappropriate use of SHDs in teaching centres so that interns and residents do not adopt such practices for the rest of their careers.

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