An investigation into the prescribing of analgesics

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Objective. To investigate the prescribing of analgesic agents in a defined South African patient population.

Design. Retrospective drug utilisation study.

Setting. Prescribing behaviour of a sample of 50 dispensing doctors in Port Elizabeth. Data were obtained from a medical aid which used a formulary system.

Main outcome measures. Percentage of central nervous system drugs that analgesics comprised; proportion of patients using combination analgesics; cost of analgesics.

Results. On average, 83.3% of all central nervous system drugs dispensed were analgesic agents. These agents represented 70.9% of the total cost of central nervous system drugs. A high percentage (82.2%) of the analgesic agents dispensed were combination or polycomponent analgesics. The combination analgesic tablet, consisting of paracetamol, meprobamate, caffeine and codeine phosphate, was the most frequently prescribed central nervous system drug. This product accounted on average for 40.4% of all analgesics dispensed. Nearly half (46.0%) of all the analgesics dispensed by the sample of doctors were available without a prescription.

Conclusion. The high prescribing rate of combination analgesic prescription was a cause for concern, given the dependence-producing potential of some of the ingredients, e.g. meprobamate. The prescribing and use of analgesics should be carefully monitored by further drug utilisation studies in light of the serious adverse effects, such as analgesic nephropathy, associated with the long-term use of these agents.

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Pain is the most common of all medical complaints.[1] Pain relief is therefore one of the most vital services rendered by physicians.[2] Various ways to obtain pain relief have been used over the years. Analgesic agents, however, form the cornerstone of treatment for pain. Under the usual clinical circumstances, the general practitioner attempts to provide analgesia by orally administered medication, choosing from the multitude of prescription and over-the-counter preparations that line pharmacists' shelves. When administered in the proper setting and used rationally, these agents are very safe. Analgesic agents, however, have covert dangers when used chronically and in higher dosages than those indicated. In South Africa in 1983, 21% of patients on renal dialysis in Johannesburg Hospital had a history of analgesic abuse.[3]

There is a wide variety of analgesic agents available in South Africa. Many of these are combination or polycomponent preparations, i.e. products that contain in their formulation various adjuvants such as codeine, caffeine, propoxyphene, meprobamate and chlormezanone. In 1993, there were more than 100 combination analgesics in tablet and capsule form available from retail pharmacies in South Africa.[4] Numerous arguments have been advanced both in favour of and in opposition to the prescription of fixed-ratio drug combinations.[5] With regard to analgesic combinations in particular, various rationales for their use have been identified.[6] Most combinations are formulated with two main rationales in mind, viz. enhancement of analgesia and reduction of adverse effects. This is achieved by the combination of two analgesics with different mechanisms of action. These drugs may also improve patient compliance and generally provide ingredients at a lower cost than if the ingredients were prescribed separately.

However, a number of arguments exist against the use of fixed-ratio analgesic combinations. The most important of these are that combinations limit flexibility and individualisation of dosage, and that combination analgesics may expose patients to ingredients not necessary for pain relief in their particular condition.[6]

Analgesics are one of the most frequently prescribed drug groups.[7] Yet, according to Gustafsson and Boëthius,[8] epidemiological studies of the utilisation of analgesics are few, in spite of their wide use as single and fixed combinations.

The primary aim of this study was therefore to investigate the prescribing patterns of a group of doctors in Port Elizabeth in respect of analgesic agents. Since no previous drug utilisation studies on analgesic prescribing had been performed on this doctor sample, it was necessary first to determine the overall drug prescribing pattern. This was done by means of a broad retrospective drug utilisation study. Thereafter, the prescribing of analgesic agents was investigated in more detail.

Subjects and methods

Prescription data from 50 dispensing doctors, out of a total population of 138 dispensing doctors, serving a homogeneous non-affluent patient population in a well-demarcated geographical area in Port Elizabeth, were analysed retrospectively. The study was carried out over 4 months in a period of 1 year (July 1992, October 1992, January 1993 and April 1993) to detect and account for any possible seasonal effects. The 50 doctors served on average 50 246 registered patients of a medical aid during the period of the study.

The study can be classified as a broad retrospective drug utilisation study with the emphasis on the prescribing of analgesic agents. The study was mainly quantitative. No diagnoses were available; therefore very few comments could be made on the quality of care.

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The doctors in the study used a formulary containing 450 drugs. Since, on average, 93.6% of all the drugs issued by this group of dispensing doctors were formulary drugs, it was decided to focus on formulary drugs in the drug utilisation study. Analgesics were classified under central nervous system drugs.

Results and discussion

A general drug utilisation study was performed to determine the frequency and cost of analgesic prescribing in relation to total prescribing. Central nervous system drugs were the most frequently dispensed therapeutic type, accounting on average for 24.9% of all formulary drugs dispensed. Central nervous system drugs accounted for only 13.6% of the average cost of formulary drugs dispensed and were therefore relatively inexpensive as a group.

Dispensing of central nervous system drugs

Eighty-eight of the 450 drugs in the formulary (19.6%) were classified as central nervous system drugs. These accounted on average for 24.9% of all formulary drugs dispensed.

The central nervous system drugs in the formulary were classified into seven therapeutic subgroups, viz. hypnotics and anxiolytics, drugs used for psychoses and related disorders, antidepressant drugs, drugs used for nausea and vertigo, analgesics, anti-epileptics and drugs used for Parkinsonism-related disorders.

The average percentage of drugs dispensed in each of these subgroups is given in Table I. Analgesics accounted on average for 83.3% of the total number of formulary central nervous system drugs dispensed. It is interesting to note that the most prescribed central nervous system subgroup (analgesics) is classified under 'symptomatic prescribing' in the teleological classification developed by McGavock *et al.*[9] These drugs relieve symptoms with little or no effect on the disease process. No definite seasonal variations were detected in the prescribing of the different central nervous system therapeutic subgroups.

Table I. Average percentage of formulary drugs dispensed in each central nervous system subgroup

Hypnotics and anxiolytics	9.03
Drugs used in psychoses and related disorders	0.10
Antidepressant drugs	1.29
Drugs used in nausea and vertigo	5.94
Analgesics	83.25
Anti-epileptics	0.39
Drugs used in Parkinsonism-related disorders	0.00
Total	100.00

An analysis was also made of the 10 central nervous system drugs on the formulary that were on average the most frequently dispensed (Table II). The first 7 products listed were all analgesic preparations.

Table II. The 10 formulary central nervous system drugs that were on average the most frequently dispensed

1	Paracetamol/meprobamate/caffeine/codeine phosphate tablets
2	Paracetamol/meprobamate/codeine phosphate capsules
3	Paracetamol syrup
4	Paracetamol/codeine phosphate tablets
5	Paracetamol/promethazine/codeine phosphate syrup
6	Aspirin/codeine phosphate tablets
7	Paracetamol tablets
8	Diazepam 5 mg tablets
9	Metoclopramide 10 mg tablets
10	Paracetamol/chlormezanone tablets

The analgesic subgroup also accounted for the highest average cost per month. If the seven central nervous system subgroups are considered, analgesics accounted on average for 70.9% of the total cost of all central nervous system drugs dispensed.

The percentage of all formulary central nervous system drugs that analgesic products represent per doctor for July 1992 is illustrated in a histogram in Fig. 1. A similar pattern was observed for the other 3 months of the study. During all 4 months, the modal frequency occurred between 80.0% and 89.9%.

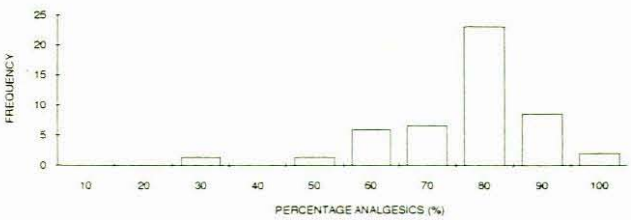

Fig. 1. Distribution of analgesics as a percentage of total central nervous system formulary items per doctor for July 1992.

The paired two-sample *t*-tests for means for sequential months were used to determine whether differences existed between months. No differences were found. It can be expected that if all calendar months were included in the study such differences could have been observed.

Dispensing of analgesic products

Thirteen products on the formulary were classified as analgesic preparations. These products are listed in Table III. Note that codeine phosphate (30 mg) was classified as an analgesic for the purposes of this study (codeine phosphate 30 mg is classified as an opioid analgesic in the *British National Formulary*[10]). It must, however, be noted that it can also be used as an antidiarrhoeal drug.

The 13 analgesics in the formulary accounted on average for 83.3% of the total number of formulary central nervous system drugs dispensed. An analysis was made to determine the prescribing rate of each analgesic. The average percentage of each formulary analgesic dispensed is given in Table III. The combination (or polycomponent) analgesic tablet, consisting of paracetamol, meprobamate, caffeine and codeine phosphate, was the most frequently prescribed central nervous system drug. This product

accounted on average for 40.4% of the total number of analgesics dispensed.

Table III. Average percentage of each formulary analgesic dispensed

Codeine phosphate 30 mg tablets	0.25
Aspirin 300 mg tablets	0.10
Aspirin soluble 300 mg tablets	0.05
Paracetamol 500 mg tablets	4.82
Paracetamol syrup	12.61
Aspirin/codeine phosphate tablets	7.99
Paracetamol/meprobamate/caffeine/codeine phosphate tablets	40.42
Paracetamol/meprobamate/codeine phosphate capsules	13.26
Paracetamol/codeine phosphate tablets	10.58
Paracetamol/chlormezanone tablets	1.73
Paracetamol/promethazine/codeine phosphate syrup	8.00
Paracetamol/codeine phosphate syrup	0.12
Propoxyphene/paracetamol capsules	0.07
Total	100.00

This drug was followed by a similar combination analgesic (consisting also of paracetamol, meprobamate and codeine phosphate, but without caffeine, and in a slightly different combination). This product was in capsule form.

These two combination analgesics containing meprobamate are classified as schedule 5 substances in South Africa. Products containing meprobamate are, however, classified as controlled drugs by the *British National Formulary*.[10] In other words, the total quantity of the preparation, or the number of dose units, must be written in both words and figures in the prescriber's own handwriting. This is equivalent to a schedule 7 drug in South Africa, and is therefore subject to greater control than a schedule 5 drug.

It is interesting to note that the two analgesics that consisted only of aspirin (aspirin 300 mg and aspirin 300 mg soluble tablets) were infrequently dispensed. The analgesics containing paracetamol were more popular than those containing aspirin. No significant seasonal variations in analgesic prescribing were detected.

Nine of the 13 analgesics listed in the formulary were available without a prescription from a doctor. These 9 products accounted on average for 46% of all analgesics dispensed. Patients could therefore have bought nearly half of the total number of analgesics dispensed from a retail pharmacy without a prescription.

An important finding of the study was that there was a clear tendency for doctors to show a preference for certain brand names. For these particular brand names, the 50 doctors displayed clustering that was confirmed by means of a chi-square test.

Dispensing of combination analgesic preparations

Eight of the 13 analgesics in the formulary were combination analgesics. These 8 represented on average 82.2% of all analgesics dispensed. The high prescribing rate of combination analgesics was a cause for concern given the dependence-producing potential of some of the ingredients as well as the possibility of nephropathy.

One combination analgesic, viz. the combination of paracetamol, meprobamate, caffeine and codeine phosphate tablets, represented on average nearly half (49.2%) of all the combination analgesics dispensed.

Cost of analgesic products dispensed

The 10 analgesics that accounted for the highest average cost per month are given in Table IV. The central nervous system drug most frequently dispensed (the combination analgesic tablet consisting of paracetamol, meprobamate, caffeine and codeine phosphate) also accounted for the highest average cost per month of all the central nervous system drugs dispensed. This represented 20.7% of the total cost of all central nervous system drugs dispensed. The 4 analgesics that accounted for the highest average cost per month were together responsible for more than 50% of the total cost of all central nervous system drugs (Table IV).

Table IV. The 10 analgesics that accounted for the highest average cost per month

	Average cost (rands)	Cost contribution to CNS drugs (%)
Paracetamol/meprobamate/caffeine/codeine phosphate tablets	16 080.67	20.73
Paracetamol/meprobamate/codeine phosphate capsules	8 352.19	10.76
Paracetamol syrup	8 324.84	10.73
Paracetamol/codeine phosphate tablets	6 983.05	9.00
Aspirin/codeine phosphate tablets	6 416.38	8.27
Paracetamol/promethazine/codeine phosphate syrup	6 411.30	8.26
Paracetamol/chlormezanone tablets	891.34	1.15
Codeine phosphate 30 mg tablets	655.22	0.84
Paracetamol 500 mg tablets	636.94	0.82
Paracetamol/codeine phosphate syrup	128.20	0.17

Conclusion

Analgesic agents form the cornerstone of treatment of pain. Yet, their usefulness for minor aches and pains is debatable. The perception of pain varies greatly between individuals, and within one person in differing circumstances. It must also be kept in mind that analgesics provide only symptomatic relief and do not influence the actual disease process.

The results of this drug utilisation study clearly showed that there was an overuse of analgesic agents, specifically combination analgesic agents. We concluded that approximately 83% of all central nervous system items dispensed by this group of doctors were analgesic agents. Since no diagnosis was available, it is difficult to explain the exact reasons for this high analgesic prescribing rate. However, if the low prescription rate of other central nervous system drugs is taken into account, the question can be asked whether this group of doctors treated anxiety and

depression with analgesics rather than with the recognised drugs for these disease states. The fact that the most frequently prescribed analgesic was a combination product containing meprobamate, a substance well known for its dependence-producing potential, is a serious cause for concern.

Furthermore, since nearly half (46%) of all analgesics dispensed by the sample of doctors were available without a prescription, it can be asked whether these patients did not abuse their medical aid. All products in the formulary were provided to patients free of charge. If they had bought these products at a retail pharmacy, the normal retail price would have been charged.

The responsibility for educating the public on the correct use of medicine rests with the custodians of medicines, viz. doctors and pharmacists. If they do not prescribe and dispense these medicines rationally, there is little chance that the public will use these products rationally. Although the results of this study were in agreement with general expectations (following discussion of the results with various local practitioners), it must be emphasised that the results can be interpreted only in terms of the patient population and methodology employed. Specifically, they cannot be extrapolated to the local retail pharmacy situation. A logical next step will be to undertake a further drug utilisation study to determine the sales of non-prescription single-component analgesics and combination analgesics by retail pharmacies, and also to investigate the demographic characteristics of analgesic users.

REFERENCES

1. Payne R. Medication-induced performance deficits: analgesics and narcotics. *J Occup Med* 1990; **32** (4): 362-369.
2. Moertel CG, Ahmann DL, Taylor WF, Schwartau N. A comparative evaluation of marketed analgesic drugs. *N Engl J Med* 1972; **286:** 813-815.
3. TPS Drug Information Centre. Non-narcotic analgesics — not so innocuous. *Medifile* 1989; Sep: 33-35.
4. Brandt D, ed. *MIMS Medical Specialities*. Pretoria: Times Media Limited, March 1993.
5. Dengler HJ, Lasagna L. Report of a workshop on fixed-ratio drug combinations. *Eur J Clin Pharmacol* 1975; **8:** 148-154.
6. Beaver WT. Combination analgesics. *Am J Med* 1984; **77**(3A): 38-53.
7. Ahonen R, Enlund H, Pakarinen V, Riihimäki S. A 1-year follow-up of prescribing patterns of analgesics in primary health care. *J Clin Pharm Ther* 1992; **17:** 43-47.
8. Gustafsson LL, Boëthius G. Utilization of analgesics from 1970 to 1978. *Acta Med Scand* 1982; **211:** 419-425.
9. McGavock H, Wilson-Davis K, Niblock RWF. Unsuspected patterns of drug utilization revealed by interrogation of a regional general practitioner prescribing database. *Pharmacoepidemiol Drug Saf* 1992; **1:** 73-80.
10. *British National Formulary*. A joint publication of the British Medical Association and the Royal Pharmaceutical Society of Great Britain, March 1994; 27.

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