Comparison of prescribing unit with index including both age and sex in assessing general practice prescribing costs

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Abstract

Objective—To examine and compare the prescribing unit and a new prescribing index adjusting for age and sex in assessing general practice prescribing.

Design—Analysis of all prescriptions issued by two practices in one year. Use of data to derive a prescribing index adjusting for age and sex. Comparison of effect of prescribing unit and new index on relation between 80 practices' prescribing data and family health services authority average.

Setting—Newcastle and Gateshead Family Health Services Authorities. Two urban practices with eight doctors and combined list size of 16300 patients.

Main outcome measures—Cost and number of prescriptions issued to each age and sex group. Effect of index on relation between practice data and family health services authority average.

Results—The number of items prescribed and total costs rose with age. Although total costs were greater for women than for men, individual items cost more for men aged 25-84. Comparison of data adjusted by the prescribing unit and the new index with authority averages produced no significant differences except in a few practices with skewed age-sex demography. Results with the two indexes differed by over 5% in 34% (27/80) of practices for costs and in 14% (11/80) for items prescribed.

Conclusions—The age and sex profile of a practice does not explain interpractice variation in prescribing patterns. Other unidentified factors need to be considered.

Introduction

Escalating prescribing costs and improved databases such as prescribing analysis and cost (PACT) data have resulted in attempts to rationalise general practice prescribing and contain expenditure. Since elderly patients account for a large proportion of the increased prescribing seen in the past decade,¹ any comparisons between data should take account of the age profile of practice populations. Currently, practice data are standardised for age by converting list sizes to prescribing units and prescribing costs are expressed per prescribing unit rather than per patient. The prescribing unit is a weighting factor created by the Department of Health, based on the observation that elderly patients receive overall three times more prescription items than others.^{2,3} Patients below 65 years of age count as one prescribing unit and those aged 65 and above count as three.

Several reports have challenged the validity of the prescribing unit.⁴⁻⁶ For example, patients in some other age groups such as the under 5s and the middle aged receive a disproportionate number of prescriptions and women are generally prescribed more items than men.

Variation in prescribing costs is apparent not only between practices but also between family health services authorities and health regions, even after adjustment with the prescribing unit.⁷ Thus another indicator is needed that will correct for the major, rational influences on the number and cost of items prescribed and facilitate direct comparison of prescribing data. We have analysed the influence of a combined index (the Newcastle prescribing index), which is based on patient age and sex, on the prescribing of general practitioners in two family health services authorities and evaluated its usefulness as a notional indicator of costs and items.

Population and methods

The study was performed in two urban practices in Tyne and Wear. Chainbridge House is a five doctor practice in Gateshead Family Health Services Authority with 10200 patients and Denton Turret is a three doctor practice in Newcastle Family Health Services Authority with 6100 patients. The age and sex profiles were similar to their family health services authority averages, although Denton Turret had 30% more patients aged over 65 years than the authority average (Denton Turret 1300, authority average 910). The number of people in each sex and Körner age band ranged from 78 to 1295 (mean 824). PACT data showed that the two practices were close to the average practice in respect of overall prescribing costs and patterns.

During 1 April 1991 to 1 April 1992, 96% (136341) of all prescriptions were issued through the practice computer system (EMIS). All hand written domiciliary prescriptions were transferred to the computer and recorded in the study. In May 1992 we searched the computer databases of both practices to establish age (Körner bands) and sex related data for all *British National Formulary* therapeutic groups and their related subgroups. The information was collated in the form of four age and sex tables for each therapeutic group and covered the number of patients who had received a prescription, the number of items issued as acute prescriptions, the number of items issued as repeat prescriptions, and total prescription costs.

The data were combined on a spreadsheet to produce the average number of items prescribed, the average cost per patient, and the average cost per item for each age and sex group. The Newcastle prescribing index was calculated from item and cost information. The adjustment factors for the 20 age and sex groups were calculated as follows: item age and sex group adjustment factor=average number of items given to each patient in the age and sex group/average number of items given to the total population; cost age and sex group adjustment factor=average cost per patient in the age and sex group/average cost per patient in the total population.

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The list size was converted to the Newcastle prescribing index by multiplying the number of patients in each age and sex band by the adjustment factor. The current prescribing unit breaks practices into two age bands (under 65 and over 65 years) and takes no account of sex. The adjustment factor was one for the under 65 group and three for the over 65 group.

The Newcastle prescribing index and the current prescribing unit were used to adjust the data for all 46 practices in Newcastle and the 34 in Gateshead to the respective family health services authority average. Differences in costs and items between the practices and the authority averages were then examined with both the Newcastle prescribing index and the prescribing unit.

Results

Comparison with PACT data showed that in the two study practices, the 4% (5701) of prescriptions not recorded on the computer were in the category labelled in PACT level III as "special groups—non-BNF." These items are incomplete on the computer drug dictionary because of inconsistencies with the drug database at the prescription pricing authority. Women received, on average, 46% more items than men a year (women 9.7, men 6.6 items). The average for the total practice population was 8.2 items a year.

The number of items prescribed differed across the age bands (table I) with a small peak in patients under 5 years old and rising rapidly from the 5-16 to 75-84 age groups. Female patients received more items than males, the difference being most marked in patients aged 17 to 64 years.

Women were prescribed drugs with average annual costs (£52.37) greater than the costs for men (£47.00). The average annual drug cost for the total practice population was £49.78. Prescribing costs varied across the age bands in a different manner to items (table II). No initial peak was seen in costs in the under 5s and the increase up to the 75-84 age group was more gradual.

TABLE I—Average number of items prescribed per person each year by sex and Körner age bands

	0-4	5-16	17-24	25-34	35-44	45-54	55-64	65-74	75-84	≥85
Male	5.91	2.84	1.92	2.48	3.30	5.69	10.60	18.41	23.95	23.99
Female	4.81	2.87	4.77	5.62	6.08	8.34	14.18	19.29	24.68	26.30
Total	5.34	2.85	3.41	4.01	4.65	7.03	12.42	18.90	24.42	25.69

TABLE II—Average annual prescribing costs (£) per person each year by sex and Körner age bands

	0-4	5-16	17-24	25-34	35-44	45-54	55-64	65-74	75-84	≥85
Male	13.77	14.30	10.23	20.66	32.07	49.21	89.36	127.02	154.57	94.21
Female	9.85	12.44	24.36	31.53	40.26	61.57	83.65	105.23	110.28	99.74
Total	11.74	13.39	17.62	25.97	36.05	55.44	86.46	114.85	125.93	98.27

TABLE III—Average cost (£) per prescription item by sex and Körner age bands

	0-4	5-16	17-24	25-34	35-44	45-54	55-64	65-74	75-84	≥85
Male	2.33	5.03	5.33	8.33	9.72	8.65	8.43	6.90	6.45	3.93
Female	2.05	4.34	5.11	5.61	6.62	7.38	5.90	5.45	4.47	3.79
Total	2.20	4.69	5.17	6.47	7.75	7.89	6.96	6.08	5.16	3.83

TABLE IV—Age and sex adjustment factors for Newcastle prescribing indices

	0-4	5-16	17-24	25-34	35-44	45-54	55-64	65-74	75-84	≥85
Male:										
Item	0.716	0.344	0.233	0.301	0.400	0.689	1.285	2.231	2.903	2.907
Cost	0.277	0.287	0.206	0.415	0.644	0.989	1.795	2.552	3.105	1.893
Female:										
Item	0.582	0.348	0.578	0.681	0.737	1.011	1.719	2.339	2.992	3.188
Cost	0.198	0.250	0.489	0.633	0.809	1.237	1.680	2.114	2.215	2.004

FIG 1—Relation between total number of items prescribed by individual practices and family health services authority average calculated after adjustment with prescribing unit and Newcastle prescribing index

FIG 2—Relation between total prescribing costs of individual practices and family health services authority average calculated after adjustment with prescribing unit and Newcastle prescribing index

Costs fell in the over 84 year olds. The difference in costs between the sexes was less than for items except in the 65-84 groups, in which prescriptions for men were more expensive.

The cost per item was highest in the 35-54 age group (table III). Prescriptions for men cost more than for women aged between 25 and 84 years. The cost per item profile explains the differing age and sex profiles for number of items received and total expenditure. The average cost per item was 31% more for men than women (£7.07 compared with £5.38). The average cost per item for the total population was £6.03.

Table IV shows the adjustment factors for age and sex used to derive the Newcastle prescribing index. The prescribing unit for the two study practices was calculated to be 3.3 based on cost for patients over 65 years (men 4.1, women 2.8) and 3.9 for items (men 4.7 and women 3.3).

Overall there was no significant difference (by paired *t* test) in the variation between individual practices and the family health services authority average based on costs and items calculated by either the Newcastle prescribing index or the prescribing unit (figs 1 and 2). However, for practices with skewed age-sex demography the deviation from family health services authority averages was different when the Newcastle prescribing index was used instead of the prescribing unit. In one extreme case the Newcastle prescribing index increased the practice relation to the

family health services authority average by 50% for cost and yet decreased the relation for items by 1% (fig 3). The variations from family health services authority averages calculated by the two methods differed by over 5% in 11 (14%) practices for items and in 27 (34%) practices for costs. The overall variation mean was -0.29 (SD 4.08)% for items and 0.01 (9.92)% for costs. Variation from authority averages by the two methods differed not only in size but in direction. For example, one practice had its relation to the authority average increased by 30% for cost and decreased by 10% for items (fig 3).

FIG 3—Change in relation of practices' cost and item data with family health services authority average when data were adjusted with Newcastle prescribing index rather than prescribing unit

Discussion

The trends in the number of prescribed items and drug costs with age and sex reflect previous findings.^{5,6,9} By using an accurate new index (the Newcastle prescribing index) to adjust for the effect of patient sex and age on prescribing in the North East we have shown that a practice age and sex demography does not explain interpractice variation in prescribing habits. Adjustment of prescribing data with the Newcastle prescribing index was more accurate than with the prescribing unit for practices with a skewed age and sex demography.

The prescribing unit was originally devised accord-

ing to the differential in the number of items prescribed in elderly and non-elderly populations and does not take drug costs into account. Extrapolations for drug costs cannot be made from the prescribing unit because of the age and sex related differences in costs per item that we have shown.

We believe that using the prescribing unit to adjust practice data for factors outside the practice's control and subsequent comparisons with family health services authority or national averages is unhelpful. Questions need to be asked. Firstly, are the influences on general practice prescribing tangible and quantifiable? Several factors may modify prescribing such as the patient (morbidity, deprivation, health education, and expectations), the doctor (workload, repeat prescription systems, consultation style, and prescribing formulary), and external criteria (therapeutic advances, primary/secondary care interface, and drug company marketing). The equation needed to adjust for practice demography will be difficult to validate. Secondly, is the family health services authority average a good marker of quality? In the blossoming environment of audit and acceptable peer review, general practitioners need a benchmark against which they can assess the quality of their prescribing. Further work is required to create a model practice based on a panel of rational prescribers with which general practitioners can compare their data.

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