Adverse drug reactions in elderly patients as contributing factor for hospital admission: cross sectional study

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Adverse reactions to drugs in elderly patients are a major clinical problem.¹ Patients' perceptions about the presence of drug reactions may contribute to their earlier detection,² but no studies have related patients' complaints about adverse reactions to the objective presence of reactions, and no study has been performed in elderly patients.

Subjects, methods, and results

All admissions of patients aged 70 and over to our medical wards from 1 February to 1 May 1994 were analysed. We excluded patients transferred from other wards and those readmitted within a month. Patients gave their informed consent. Data were collected on drug treatment, and patients were asked whether they thought any of their medical problems were caused by their drugs. The presence and severity of an adverse reaction was assessed from the history, examination, and laboratory tests, using the methods of Kramer et al³ and Hutchinson et al⁴ and the *British National Formulary*.⁵ A reaction was defined as severe if it was potentially life threatening or led to admission. Differences in patient characteristics (table) and the use of specific drugs in patients with adverse reactions and those without were tested with χ^2 or Fisher's test for dichotomous variables and Student's *t* test or the Mann-Whitney test for continuous variables. Variables with a significant influence on univariate analysis ($P \leq 0.05$) were used in a backward selection (using $P < 0.05$ as criterion) to build a multiple logistic regression model. Results are expressed as two tailed *P* values.

A total of 128 patients were identified (24% of all admissions), but 22 were excluded because of transfer, readmission, refusal, or death. The 106 patients had a mean age of 78 (70-91); 60 were women. Of the total, 102 were receiving drug treatment (mean 5.9 drugs); 44 patients admitted (42%, 95% confidence interval 32% to 51%) had had one or more adverse reactions and 25 had had severe reactions (24%, 16% to 32%). None of the 15 deaths during the study were directly related to an adverse drug reaction.

Comparison of patients with and without an adverse reaction causing admission was feasible in 12 patients with gastrointestinal bleeding or haematuria: 5 were taking an oral anticoagulant, which was used by only 9 of the 94 patients who were not admitted for bleeding ($P = 0.009$). In multivariate analysis a fall before admission (odds ratio 51.3 (3.2 to 834.3), $P = 0.006$), the presence of gastrointestinal bleeding or haematuria (19.8 (4.4 to 88.6), $P < 0.001$), and the use of three or more drugs (14.5 (1.2 to 175.3), $P = 0.04$) were significant factors in patients with severe adverse reactions (table). Severe reactions in 5 patients admitted after falling included orthostatic hypotension (2 patients were taking diuretics), drug intoxication (1 patient taking carbamazepine and 1, phenobarbi-

tone), and anaemia caused by gastrointestinal bleeding (1 taking a non-steroidal anti-inflammatory drug).

The 102 patients having drug treatment were asked whether they had complaints caused by their drugs. A correct opinion about the presence of adverse drug reactions was found in 73 of the 93 patients (79%, 70% to 87%) who could answer the question: 28 correctly recognised a reaction, while 45 who did not complain of an adverse reaction correctly affirmed its absence—a sensitivity of 0.70 and a specificity of 0.85. The negative predictive value of the question was 0.79 and the positive predictive value 0.78. Eighteen of the 25 patients with a severe reaction could not, however, implicate the drug in their current illness; these severe reactions were unrecognised by 14 of the 57 patients who did not complain of adverse reactions (24.6%) and in 4 of the 9 patients who could not answer the question.

Comment

Overall, 1 in 6 elderly patients admitted to a general ward experienced adverse drug reactions; severe reactions occurred in 24%. This study confirms the view that drug reactions are related to the use of more drugs rather than the presence of more diagnoses. Other significant factors in severe reactions were a fall before

Characteristics of 106 patients admitted with and without severe adverse reactions to drugs. Values are numbers (percentages) unless stated otherwise

	Patients		P value
	With severe reaction (n=25)	Without severe reaction (n=81)	
Mean age (years)	77	78	0.39
Female sex	12 (48)	48 (59)	0.32
Living alone and independently	8 (32)	37 (46)	0.23
Unmarried	14 (56)	49 (61)	0.69
Drives a car	6 (24)	18 (22)	0.85
Uses cigarettes	7 (28)	16 (20)	0.38
Uses alcohol	5 (20)	13 (16)	0.76
Acute admission	18 (72)	43 (53)	0.09
Needs help taking drug treatment	9 (36)	31 (38)	0.84
Mobility score <3*	16 (64)	52 (64)	0.99
Activity of daily living index <3†	17 (68)	53 (65)	0.81
Use of ≥ 3 drugs	24 (96)	62 (77)	0.04
≥ 5 diagnoses	16 (64)	27 (33)	0.006
Admission for:			
Falling	5 (20)	1 (1)	0.003
Gastrointestinal bleeding or haematuria‡	10 (40)	4 (5)	0.0006
Other disease:			
Chronic obstructive pulmonary disease	9 (36)	12 (15)	0.04
Cardiovascular disease	22 (88)	54 (67)	0.04
Diabetes	7 (28)	23 (28)	0.97
End stage renal failure	3 (12)	12 (15)	1.00

*Ranges from 0 (no mobility problems) to 16 (complete immobility).

†Ranges from 0 (independent) to 20 (completely dependent).

‡In 2 patients bleeding was not the cause of hospital admission.

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admission and the presence of gastrointestinal bleeding or haematuria. Mild drug reactions were well recognised by these patients, but not severe ones.

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- 1 Van Kraaij DJW, Haagsma CJ, Go IH, Gribnau FWJ. Drug use and adverse drug reactions in 105 elderly patients admitted to a general medical ward. *Neth J Med* 1994;44:166-73.

- 2 Egberts TCG, Smulders M, de Koning FHP, Meyboom RHB, Leufkens HGM. Can adverse drug reactions be detected earlier? A comparison of reports by patients and professionals. *BMJ* 1996;313:530-1.
- 3 Kramer MS, Leventhal JM, Hutchinson TA, Feinstein AR. An algorithm for the operational assessment of adverse drug reactions. I. Background, description, and instructions for use. *JAMA* 1979;242:623-32.
- 4 Hutchinson TA, Leventhal JM, Kramer MS, Karch FE, Lipman AG, Feinstein AR. An algorithm for the operational assessment of adverse drug reactions. II. Demonstration of reproducibility and validity. *JAMA* 1979;242:633-8.
- 5 British Medical Association, Royal Pharmaceutical Society of Great Britain. *British National Formulary*. London: BMA, RPS, 1994. (No 27.)

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Breast examinations in older women: questionnaire survey of attitudes of patients and doctors

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Breast examination is important in older women, in whom the incidence of breast cancer is higher.¹ It is, however, an intimate examination, and older patients and doctors may be deterred for several reasons. The attitudes of older women to this procedure have not previously been established. Both this and the attitudes of doctors may determine whether the procedure remains part of the routine physical examination.

Subjects, methods, and results

The study was approved by the Wirral district's ethics committee. One hundred elderly (mean (range) age 83 (71-94) years) female inpatients (abbreviated mental test score 8/10 or more) were interviewed by a doctor not involved in their medical care. All patients were fully recovered from their acute illness. A questionnaire (available from us) was administered and the responses recorded. The case notes of the same 100 patients were audited by using a standardised proforma.

One hundred hospital doctors working in two hospitals were given a questionnaire (available from us); 75 responded. Replies were anonymous so non-responders could not be recontacted.

Review of 100 case notes showed only 11 of the patients had had a breast examination documented (two of which yielded abnormal results). Of 10 patients with a history of bone pain, only one had a breast examination, while four with weight loss had no breast examination documented. Liver function tests gave abnormal results in 15 women, only two of whom had a breast examination. There were five patients with a history of breast cancer, none of whom had a breast examination documented.

None of the patients said they would be offended if they were asked to undergo a breast examination. Fifty four patients felt neutral about it, 32 would be pleased to be asked, 10 would be reluctant about being examined, two would be upset, and two would be embarrassed. Most patients (86) thought a breast examination was important and would give permission for this examination. Most (88) also had not had mammography or a breast examination previously. A few patients (12) said that they would always want a chaperone, while 18 wanted a chaperone only when a male

doctor was examining. Most (70) were not concerned whether a chaperone was present or not. Only a few patients (13) thought a breast examination would worry them, while 45 thought it would reassure them. None of the patients had refused to undergo a breast examination. Some (25) would prefer a female doctor to examine them, but most (70) had no preference.

Of the hospital doctors interviewed, only five said that they would routinely do a breast examination on every woman over the age of 50 years, though 43 thought breast examinations should be a routine part of the physical examination. Some doctors (15) felt uncomfortable in performing breast examinations, and 34 (all men) would insist on a chaperone. Only 12 would be deterred because of the possibility of being accused of assault. Most hospital doctors (56) did not think women were offended by breast examinations. A small number of doctors (11) did not feel confident in detecting breast lumps because of inadequate training.

Comment

The treatment women of all ages should be getting for breast cancer has been outlined.² About 40% of women with breast cancer are aged over 70.³ Giving women of 70 or over "adequate" treatment can enable them to reach a five year survival rate similar to that for younger women.⁴

Few women in this study had had a breast examination or undergone mammography. As most of our patients regarded a breast examination as important and would give permission, omission must be due to failure by medical staff to do this examination. Few doctors would routinely do a breast examination on women over the age of 50, although over half thought it should be done as part of the physical examination. Most doctors thought women were not offended so omission is not because of fear of offending patients. There are probably multifactorial reasons why doctors do not routinely perform breast examinations: some feel uncomfortable, a few lack confidence, and some are deterred by claims of assault. Requirement of a chaperone may make examination difficult as nursing staff may not be available. It may not be a priority in the assessment of an acute medical emergency and subse-