PAPERS AND ORIGINALS

Pattern and quality of recording pre-admission drug treatment in paediatric patients

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Summary

The pattern and quality of recording drug use before admission was examined in children admitted to a paediatric unit over eight months. The preadmission drug intake (1.7 drugs/patient) was lower than that of adults. Antibiotics were the most frequently prescribed drugs, but mild analgesics and antihistamine preparations were commonly used, often without medical advice. The simultaneous administration of prescribed and non-prescribed drugs appeared to be as common in children as in adults. The number of drugs taken was related to the number of domiciliary consultations received and the number of doctors seen so as to confirm that most doctors' visits result in the prescription of medicines.

The transfer and recording of drug information was poor, owing principally to lack of communication between doctors and failure to detect self-medication, but the modern practices of self-referral to hospital and use of multiple prescribers have further reduced the information available. The use of a "current treatment card" is required if the full significance of iatrogenic disease in childhood is to be investigated.

Introduction

Investigation of the nature and significance of iatrogenic disease requires accurate recording of the drug intake of patients,^{1 2} but studies in adults have shown that the transfer of information about preadmission medication is unsatisfactory.^{3 4} This also applies in paediatric practice, where the pattern of drug use is different^{5 6} and the effects of adverse drug reactions have yet to be elucidated.

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This study investigated the nature of preadmission drug treatment in children admitted to a paediatric unit and attempted to identify the factors interfering with the accurate transfer and recording of drug information.

Method

Data were obtained by interviewing the mothers of patients admitted as emergencies, or from the "waiting list," to a general paediatric unit (48 beds) over eight months. We studied 570 admissions, involving 524 children, and excluded 120 further admissions because an adequate history could not be obtained (mothers not seen, language difficulty, etc).

Details of drugs administered during the illness leading to admission in emergency cases or during the previous month in arranged cases were recorded on a standard form as "current" if taken within 24 hours of admission or "prior" if used at another time. Specific inquiry was made about self-medication, a check-list of available home remedies being used to ensure completeness of these data. Information was also obtained on aspects of preadmission care including the number of domiciliary consultations received and the number of different doctors seen. The presence, or absence, of a referral letter was confirmed with the parents.

Mothers were asked to bring, for examination, all drugs which they had administered. The mothers' histories were then compared with the information received in practitioners' letters, details contained in pre-existing case sheets, and those recorded at admission by receiving officers (who were unaware of the purpose of the study).

Results

POPULATION STUDIED

Details of drug use and communication were studied in 570 admissions (524 children; 304 boys). Tables I and II illustrate the age distribution, types of admission, and diagnostic categories. The average age was 4.7 years and the average duration of illness, in emergency cases, was eight days. Of the 16 patients admitted because of ingesting foreign substances four had been poisoned by their own current medication (three accidental, one iatrogenic).

DRUG USAGE

The mothers of 413 patients had administered 961 preparations, 244 (24.5%) of which were self-medications (table I). The study team

TABLE I—Age and drug distribution of 570 patients (961 drugs)

Age group (years)	No of patient admissions			No of patients receiving drugs	Drugs taken			No of drugs as self-medication	Drugs/patient
	Emergency	arranged	Total		Current	Prior	Total		
<1	104	11	115	100	140	90	230	70	2.0
1-2	76	10	86	62	98	30	128	41	1.5
2-3	39	15	54	38	57	27	84	17	1.6
3-4	29	7	36	26	41	20	61	18	1.7
4-5	27	19	46	30	42	27	69	13	1.5
5-6	30	16	46	34	63	29	92	22	2.0
6-7	21	14	35	27	49	9	58	10	1.6
7-8	11	14	25	19	31	19	50	9	2.0
8-9	17	9	26	18	30	12	42	11	1.6
9-10	10	10	20	12	19	9	28	10	1.4
10-11	13	7	20	12	18	6	24	4	1.2
11-12	12	7	19	15	26	16	42	5	2.2
>12	9	31	40	20	28	25	53	14	1.3
Total	398	172	570	413	642	319	961	244	

TABLE II—Diagnostic categories and frequency of types of drugs used (570 admissions)

Diagnostic categories	No of admissions	No of patients not treated	Types of drugs taken								
			Anti-bacterials	Analgesics	Ointments and skin preparations	Compound anti-histamine preparations	Anti-histamines	Anti-convulsants	Broncho-dilators	Unidentified	Others
Respiratory ..	151	28	74	39	10	22	21	5	34	31	75
(Respiratory infection/convulsion) ..	(21)	(7)	(12)	(7)	(0)	(3)	(3)	(0)	(1)	(1)	(9)
Central nervous system ..	78	13	23	25	6	6	1	29	1	10	28
Cardiovascular system ..	65	37	15	8	2	6	1	1	0	5	20
Genitourinary system ..	40	8	21	13	0	5	1	1	0	4	19
Alimentary system ..	43	11	12	4	2	5	1	0	0	8	21
Skin	33	3	7	9	58	6	12	0	0	8	3
Haematological	33	10	6	6	2	0	8	0	0	8	28
Endocrinological	26	11	2	3	0	0	1	0	0	5	20
Poisoning	16	12	0	0	0	0	0	0	0	2	4
Others	64	17	23	8	1	3	0	1	1	21	54
Total ..	570	157	195	122	81	56	49	37	37	103	281

examined 532 drugs. The average intake was 1.7 drugs per patient and there was no significant difference in drug usage between the age groups (analysis of variance).

The most frequently encountered drug groups are shown in table II. Ampicillin was the commonest single drug. It is interesting, however, to note the widespread use of simple analgesics and antihistamine compounds as these are seldom mentioned unless specific inquiry is made.

Three factors appeared to have particular influence upon drug use: (a) the number of different doctors seen; (b) the number of domiciliary visits received; and (c) the duration of illness (in emergency cases).

In table III the relative effects of duration of illness and the number of domiciliary consultations on the average drug intake per patient are shown, while in table IV the effect of the number of doctors seen is illustrated. Examination of these trends showed that the number of consultations received was the most important factor.

TABLE III—Relationship between duration of illness, domiciliary visits, and drug usage in 398 emergency cases

Duration of illness (days)	Domiciliary consultations				
	0	1	2	3	≥4
<i>Emergency cases</i>					
1 ..	0.61	0.84	2.07	2.75*	4.0*
2-4 ..	0.85	1.75	2.56	2.21	4.17
5-7 ..	1.00*	1.63	2.00	2.67	3.00
8-10 ..	2.00*	†	2.28	3.00	3.25*
>10 ..	3.50	1.71	2.83	3.93	3.85
<i>Arranged cases</i>					
	0.85	2.00	1.33	2.60*	3.83*

*Calculated on small sample.

†Insufficient data.

RECORDING OF DRUG INFORMATION

The transfer and recording of drug information was unsatisfactory (table V) due principally to the mode of referral and lack of an accurate drug history at admission.

Of the 961 drugs taken, outside sources gave helpful information on 119 (12.3%) while receiving officers recorded 442 (46%). Pre-existing hospital records identified 121 (12.6%) drugs. No information was

TABLE IV—Drug intake in relation to number of doctors seen

No of doctors seen	Emergency			Arranged		
	No of patients	No of drugs taken	No of drugs per patient	No of patients	No of drugs taken	No of drugs per patient
0 ..	81	69	0.9	126	107	0.8
1 ..	206	351	1.7	37	77	2.1
2 ..	92	279	3.0	7	20	2.9
3 ..	11	26	2.4	2	10	5.0
≥4 ..	8	22	2.8	0	0	0

TABLE V—Information recorded on 961 drugs taken

Medication	No of drugs taken	Information recorded			No of drugs examined
		By outside sources	On admission	In previous hospital notes	
Prescribed:					
Current	491	101	319	81	312
Prior	226	14	84	40	98
Self-medication:					
Current	151	4	28	0	83
Prior	93	0	11	0	39
Total	961	119	442	121	532

received about 842 drugs taken by 484 patients. Arranged admissions seldom brought up-to-date letters and details of only three of the 214 drugs taken by 172 patients were received. In the "emergency" group (table VI) 150 patients (238 drugs) were admitted after self-referral to hospital and therefore brought no communication from their doctors. No letter accompanied 60 patients (108 drugs) referred by general practitioners and 13 patients (12 drugs) referred by hospital doctors, while referral letters accompanying 75 children (129 drugs) gave no drug history. General practitioners and their deputies gave written details of 106 drugs taken by 77 patients but failed to record the use of 107 drugs (64 prescribed, 43 self-medications).

Admissions directly from outpatient departments at routine return visits constituted most of the "other" group. Although these patients had on occasion received further medication since the last consultation, the changes were seldom notified to the hospital. Self-medication was

TABLE VI—Mode of referral and information available on 398 emergency cases

Referral type	Self-referral			General Practitioner			Deputising Services			Other hospital after self-referral			Other hospital not after self-referral			Other		
	No of patients	Drugs taken	Drugs in-formed	No of patients	Drugs taken	Drugs in-formed	No of patients	Drugs taken	Drugs in-formed	No of patients	Drugs taken	Drugs in-formed	No of patients	Drugs taken	Drugs in-formed	No of patients	Drugs taken	Drugs in-formed
Without letter ...	128	194	0	52	81	0	8	27	0	7	7	0	6	5	0	28	56	0
Letter without drug history ...	0	0	0	52	84	0	13	22	0	9	23	0	1	0	0	9	15	0
Letter with drug history ...	0	0	0	69	192	98	8	21	8	6	14	6	1	1	1	1	5	3
Total ...	128	194	0	173	357	98	29	70	8	22	44	6	8	6	1	38	76	3

rarely mentioned in referral letters and receiving officers failed to record 81% of non-prescribed drugs in current use. Also, parents had recently obtained 48% of these preparations across the pharmacy counter and were often unaware of their exact nature.

MULTIPLE PRESCRIBERS

Children often received medicines from more than one doctor but without knowing the quality of individual practice records we were unable to assess the accuracy of the transfer of information in the community.

Discussion

The appreciable part played by preadmission medication in producing adverse drug effects has been recognised by hospital-based workers,⁷ while experience in general practice has shown that iatrogenic disease is comparatively frequent.⁸ In children we have found that 10% of adverse drug reactions are attributable to treatment prescribed in the community.⁹ Reports from other workers, however, suggest that the problem may be greater than is realised.¹⁰

The widespread use of drugs by "healthy" adults and children has been shown by community surveys^{11 12} but little is known of the effect which disease has on drug use in childhood today. Indirect evidence¹² has suggested that more general practitioner consultations were resulting in prescribing medicines and that self-medication was becoming more common. Our analysis of the effects on drug use of various aspects of preadmission care appear to support this conclusion and, in circumstances of poor communication, a knowledge of common prescribing patterns may be valuable to the clinician.

In common with others,^{13 14} we find that, on average, sick children receive fewer drugs than comparable groups of adults but the simultaneous use of prescribed and non-prescribed medicines is no less significant in childhood.⁴ It is disturbing, therefore, to note that this does not appear to be widely appreciated among doctors concerned in child care despite there being high rate of use of drugs with potential toxicity for children (such as aspirin).

Differences of method prevent direct comparison of our results with those of adult studies in which the omission of drug information from practitioners' letters was the only adverse effect considered in detail, although the authors alluded to the

possible role of other factors. Our attempt to analyse these factors has shown that, although there is continuing failure on the part of the doctors to communicate fully with each other, the more frequent use of hospital services as a source of primary care and our inability to document medicines purchased from a pharmacy to treat the early signs of illness have created problems which cannot be solved merely by more efficient application of the communication methods used at present.

Sick children receive a wide spectrum of active compounds from several sources and, if the importance of iatrogenic disease in childhood is to be fully appreciated, some system is required to overcome the effects of these diverse factors. We conclude that the use of a "current treatment card"¹⁵ is the most appropriate method. A continuous record of this type could provide reliable information on drugs received from physicians and pharmacists while details of self-medication from the family drug cupboard are usually available if the right questions are asked.

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