Use of drugs by children

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Abstract

To obtain information on the use of prescribed and non-prescribed drugs in the general population of children 1590 children were surveyed in 1984-5 by weekly questionnaires filled out by parents. Drugs were taken in 13% of the 26 weeks studied and on 9% of the 182 days. Use in the summer and winter was similar. More than half (56%) of all drugs were taken on Saturdays and Sundays. Boys took drugs on 11% of days and girls on 8% of days. Almost half (45%) of drugs taken were not prescribed. Drugs acting on the respiratory tract and on coughs accounted for 42.2% of the drugs used. Analgesics were taken on 14.0% of days and antimicrobials on 12.5%. Aspirin accounted for 14.9% of all drugs used in any one week and for 31.7% of drugs obtained without prescription. Aspirin, paracetamol, triprolidine-pseudoephedrine (Actifed), ampicillin or amoxycillin, and salbutamol were the drugs most frequently used.

The widespread use of drugs obtained without prescription suggests that community pharmacists and parents would benefit from further education on the choice of treatment in relation to symptoms. Doctors should be aware of the extent of treatment with non-prescription drugs and consider playing a greater part in advising on its indications.

Introduction

The nature and extent of the use of drugs by children vary widely. Social influence may be greater than the influence of medical practice. The number of drugs available, the number of diseases that can be treated, and the expectations of the general public, which can be affected by previous medical practice, all tend to increase the use of drugs. Continuing audit is necessary to determine changes in the patterns of drug use.

Drugs are obtained primarily through prescription by hospital doctors and general practitioners and from over the counter sales at local pharmacies and supermarkets. Results of surveys of drugs prescribed for selected inpatients and specific age groups and of aspects of prescribing by general practitioners have been reported.¹⁻¹⁰ Some surveys have considered drugs available without a prescription,^{7,11} but no large scale, comprehensive surveys of use of drugs (both obtained on prescription and not prescribed) by children over more than two days have been reported. The relative use of drugs available without a prescription therefore remains unknown. Our survey aimed at providing such information by monitoring drug use in a large number of children.

Subjects and methods

A total of 1590 children was surveyed. The children were pupils or siblings of pupils attending 19 play groups, nurseries, or infant, junior, or senior schools in the Birmingham area. A letter indicating the aims of the survey was distributed to parents after meetings at

the schools between the parents and nurses carrying out the research. Parents who gave written confirmation of their willingness to participate in the survey were asked to record the drugs their children took, giving the name of drug, source, dosage, frequency, interval between doses, and symptoms or reason for using the drug. Questionnaires were distributed and collected weekly by the nurses (REC, MER) at the schools. Two periods of 13 weeks, one in summer 1984 and one in winter 1984-5, were surveyed. The parents were free to withdraw from the study at any time.

Data from the questionnaires were weighted as if all the children had completed each 13 week period and as if each single year age group, both sexes, and all social classes were equally represented. This weighting process allowed the factors that affect drug use to be compared. It did not reduce any bias in the original data. Results are given for age groups approximating to the preschool period, infant school age, junior school age, and secondary school age.

Results

Of the 1590 children surveyed, 508 were studied only in summer, 812 only in winter, and 193 in both summer and winter. Table I shows the number of children and length of survey in each age group. Each year group between the ages of 3 and 11 included over 100 children. The total number of weeks surveyed was 19 977, each child being surveyed for a mean of 11 weeks. Table II shows the distribution by social class and sex of the survey population compared with the Registrar General's data.¹² Over one fifth of the parents in our survey failed to provide information on the occupation of the major earner.

Drugs were used in a mean of 13% of weeks and on a mean of 9% of days. Table I gives the results for each age group. Analysis of days on which drugs were used

TABLE I—Number of children surveyed, length of survey, and use of drugs in children (n = 1590) by age

Age (years)	No of children surveyed	Mean No of weeks surveyed	Mean % of weeks during drugs used	Mean % of days drug used
0	18	196		
1	45	590		
2	63	783	11	10
3	104	1 198		
4	139	1 768		
5	149	2 058		
6	134	1 887	12	12
7	164	1 947		
8	123	1 626		
9	143	1 816	14	9
10	146	1 764		
11	135	1 614		
12	94	1 177		
13	57	716	20	6.5
14	39	469		
15	29	298		
16	8	70		
Total Mean	1 590	19 977	13%	9%

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showed that children aged 5-7 used drugs more than average (12% of days) and children aged 11-16 used drugs less than average (6.5% of days). Analysis of use of drugs within any one week, however, showed that 11-16 year olds used drugs in more than 20% of the weeks surveyed. Drug use was similar in winter and summer, although drugs were taken in a higher proportion of weeks in winter (14%) compared with summer (10%).

Table II gives the percentage of days on which drugs were used by social class and sex. Drugs were used most (11.9% of days) by children of semiskilled workers and least by children of the unemployed (7%). Boys used drugs on more days (11%) than girls (8%).

TABLE II—Social class and sex of 1590 children surveyed for use of drugs compared with general population, and daily use of drugs

Social class	Children in survey (%)	General population ¹² (%)	% Of days on which drugs were used
I	9.2	4.7	10.3
II	14.8	14.9	10.3
III Non-manual	24.9	21.9	9.1
III Manual	16.6	33.1	8.7
IV	7.4	18.9	11.9
V	2.6	6.5	9.1
Unemployed	2.9		7.0
Unknown	21.6		10.0
Boys	52.5	51.6	11.0
Girls	47.6	48.4	8.0

Drug use by day of week

A single drug was taken in 68% of the weeks and 78% of the days on which drugs were taken, two drugs in 23% of the weeks and 19% of the days, and more than two drugs in 9% of the weeks and less than 3% of the days. Drug use was greater on Saturday and Sunday than on other days; more than one half of total drug use occurred on these days (figure).

TABLE III—Sources of drugs used most commonly. Values are percentages of weeks in which drugs from that source were used

Drugs from all sources	%	Drugs obtained on prescription	%	Non-prescription drugs	%
Aspirin	14.9	Ampicillin or amoxycillin	8.8	Aspirin	31.7
Paracetamol	10.3	Salbutamol	8.5	Paracetamol	19.4
Actifed (expectorant)	6.3	Actifed (expectorant)	7.8	Cough suppressants	9.7
Ampicillin or amoxycillin	5.2	Brompheniramine maleate	5.0	Vitamins	5.9
Salbutamol	4.9	Sodium cromoglycate	4.5	Benylin (expectorant/decongestant)	5.1
Cough suppressants	4.9	Erythromycin	4.3	Actifed (expectorant)	4.7
Vitamins	3.9	Phenoxymethylpenicillin	4.1	Antidiarrhoeals	1.8
Brompheniramine maleate	3.0	Paracetamol	4.0	Local nasal preparations	1.1
Sodium cromoglycate	2.7	Promethazine	3.1	Antihistamines	1.1
Erythromycin	2.3	Vitamins	1.5	Antispasmodics	1.0

TABLE IV—Drugs most commonly used by age group, social class, and day of week*

Drug	% Of days on which drug was used (n=67 790)	Age	Social class	Day of week
Salbutamol	6.6	5-7 Years>others	I, V>II, IIIN, IIIM, IV>unemployed	Saturday>others
Vitamins	6.5	0-4 Years<others	V>others	Saturday>others
Aspirin	6.3	=	=	Sunday>others
Actifed (expectorant)	6.0	0-7 Years>others	=	=
Ampicillin or amoxycillin	5.8	11-16 Years<others	=	=
Paracetamol	5.1	=	=	Sunday>others
Sodium cromoglycate	5.0	11-16 Years<others†	=	=
Cough suppressants	4.9	11-16 Years<others	=	=
Brompheniramine maleate	4.8	8-16 Years<others	V>others	Saturday>others
Antihistamines‡	4.4	=	=	=
Cough expectorants	4.1	=	=	=
ENT preparation	3.3	8-10 Years>others	IV>others	=
Bronchodilators§	3.0	0-4 Years<others	=	=
		5-7 Years>others	=	=
Phenoxymethylpenicillin	2.5	=	=	=
Erythromycin	2.5	0-7 Years>others	=	=
Benylin (expectorant)	2.3	=	=	=
Inhaled steroids	1.7	11-16 Years<others†	=	=
Promethazine	1.3	=	=	Sunday>others
Antidiarrhoeals	0.7	=	=	=
Antispasmodics	0.7	0-4 Years>others	=	Sunday>others

*A>B: Use in group A exceeded use in group B by more than 100%. A<B: Use in group A less than half use in group B. =: Use in any group did not exceed use in any other group by more than 100%.

†Not given to children under 5.

‡Other than promethazine.

§Other than salbutamol.

TABLE V—Groups of drugs used by children

	% Of days used
Respiratory drugs	23.6
Cough medicines	18.6
Antimicrobials	14.0
Analgesics	12.5
Nutritional drugs	7.0
Local skin and eye treatments	4.5
Antihistamines	4.4
Alimentary drugs	3.1
Anticonvulsants	2.1
Cardioactive drugs	1.6
Psychoactive drugs	1.0
Hormones	0.2
Miscellaneous drugs	7.6

in summer as in winter, whereas ampicillin and amoxycillin and cough medicines were used appreciably more in winter. When drugs were considered in groups those affecting the respiratory system (including cough medicines) accounted for over 40% of total drug use; antimicrobial drugs and analgesics each accounted for about 13% (table V). The use of respiratory drugs was appreciably greater in children aged 5-7 than in other age groups. Use by boys of respiratory, nutritional, psychotropic, and anti-convulsant drugs was twice that by girls.

Discussion

Most studies of drug use have considered specific groups of people. Thus there are reports of drug use in hospital populations,^{1,3,4} children of specific age,^{5,6} and children with specific diseases or receiving specific drugs,¹³ and of prescribing by general practitioners.⁸⁻¹⁰ Our survey collected data on the use of drugs from all sources, including those not obtained on prescription. We report the drugs actually taken by children, not just the intention to take drugs as would be indicated by surveying prescriptions issued or medicines sold at retail outlets.

Drug use varies with time and area according to the education of doctors, pharmacists, and the general public; the availability of drugs; cultural differences in the response to symptoms of disease; and diseases present in the population. The results of this survey are therefore valid for a fairly small group of children in Birmingham in 1984-5 and could be extrapolated to the total child population of the United Kingdom at that time.

The survey population was not uniform, and the bias of the sample is not known. The smaller numbers in the lower age groups reflect the greater difficulty in recruiting children not attending school. The smaller numbers of children in the older age groups are those who continued to take part—that is, excluding those who had dropped out; this is itself perhaps a function of age. Neither the social class distribution of the entire population from which the sample was drawn nor the number of parents who did not wish to participate in the survey and their reasons for this are known. We had expected that people would fail to complete the questionnaire for all weeks of our study as this is a usual response to detailed questionnaires administered repeatedly. The drop out rate was not related to age and was not analysed for social class.

The different methods used in surveys compound the difficulties in comparing different populations of children. Nevertheless, the use of drugs by children was less in this survey (one day in 10 and one week in eight) than the use reported in a housing estate in the 1960s,⁷ in an international study that included children from the United Kingdom,² and in children in hospital with general complaints, over half of whom receive an average of 2.5 drugs in any one week.⁴ The greater proportion of days on which children aged 5-7 took drugs relates to greater use of long term drug treatment; in children 11-16 years old more drugs were taken sporadically (for example, aspirin, paracetamol), which accounts for the greater proportion of weeks in which drugs were used. It is perhaps surprising that drug use in children aged 0-4 was not greater as most childhood illness occurs in this group.

As respiratory tract infections are more common in winter greater use of drugs to treat coughs and colds in winter compared with summer is expected. Likewise, greater use of drugs to treat asthma and allergies in summer reflects the pollen and other allergens prevalent at this time. The greater use of drugs on Saturdays and Sundays in our study probably reflects heightened parental awareness of symptoms in their children at weekends, when more time is spent at home during the day. We were not able to check family doctors' records for evidence of greater morbidity at weekends or to assess the availability of medical care at this time.

Almost one half of all drugs taken were not prescribed. This finding supports recent moves to include more extensive teaching in undergraduate curriculums in pharmacy on how to respond to symptoms in children. It also shows the importance of specific health education programmes relating to use of medicines. No analgesics were prescribed for headache, and this is similar to findings of low use of analgesics in children in the United States.¹¹ It is unclear whether this relates to the prescribing habits of general practitioners or the low importance attached to mild recurrent pain in childhood. As analgesics obtained over the counter are cheaper than those on prescription general practitioners tend not to prescribe them for adults, and they may carry this practice over to children, though prescribed drugs are free to children.

Salbutamol was the most commonly taken drug, and its frequent use reflects the high incidence and chronicity of asthma in children and perhaps also shows that the many attempts to educate doctors about the prevalence of asthma have succeeded. Aspirin was widely used as a non-prescription drug before it was implicated in Reye's syndrome, but considerable reduction in its use is to be expected as a result of the recommendations of the Committee on Safety of Medicines.¹⁴

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