

The use of medication in infants in Alexandria, Egypt

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استعمال الأدوية في الأطفال الرضع بالإسكندرية، مصر عادل زكي ومعتز عبد الفتاح وآمال باسيلي ومصطفى عرفة ورامز بدواني

خلاصة: لم يسبق في مصر أن جرت دراسة محدّدت استعمال الأدوية بين الأطفال الرضع ولا دواعيها المنطقية. وفي هذه المقالة نلقي نظرة عامة على استعمال الأدوية الموصوفة وغير الموصوفة طبياً، على مدى شهر، بين الأطفال الرضع في الإسكندرية بجمهورية مصر العربية. ففي 89.6% من الحالات قالت الأمهات إن أطفالهن عانوا من بعض العلل التي استلزمت التدخل. كما أن 27.5% استعملن علاجات شعبية أو أدوية من دون وصفة طبية، بينما سعى 72.5% إلى المشورة الطبية. وكانت الأدوية التي استعملت من دون وصفة طبية هي، غالباً، مضادات التشنج وخافضات الحمى. إن هذه الدراسة لتقدّم أول نظرة عامة على تواتر استعمال الأدوية من دون وصفة طبية في الأطفال الرضع، وتكشف بعض مؤشرات (مُشعرات) الوصف غير الرشيد للأدوية من قِبَل الأطباء.

ABSTRACT In Egypt, the determinants and rationale for drug use among infants have not been previously studied. We give an overview of the use of prescribed and non-prescribed medication over a 1-month period in infants in Alexandria, Egypt. In 89.6% of cases mothers stated that their infants had suffered some ailments which necessitated intervention; 27.5% used traditional therapies or non-prescribed medication and 72.5% sought medical advice. The non-prescribed medicines used were mainly antispasmodics and antipyretics. This study provides the first overview of the frequency of use of non-prescribed medication in infants and detected some indicators of irrational drug prescribing by physicians.

L'utilisation des médicaments chez les nourrissons à Alexandrie, Egypte.

RESUME Les déterminants et les principes de base de l'utilisation des médicaments chez les nourrissons n'ont pas été étudiés précédemment en Egypte. Nous présentons un aperçu général de l'utilisation des médicaments vendus sur et sans ordonnance sur une période d'un mois chez des nourrissons à Alexandrie (Egypte). Dans 89,6% des cas, les mères ont déclaré que leurs enfants avaient eu certaines affections qui avaient nécessité une intervention; 27,5% ont utilisé des remèdes traditionnels et des médicaments vendus sans ordonnance et 72,5% ont recherché un avis médical. Les médicaments vendus sans ordonnance qui étaient utilisés étaient principalement des antispasmodiques et des antipyrétiques. Cette étude fournit la première synthèse relative à la fréquence de l'utilisation des médicaments vendus sans ordonnance chez les nourrissons et a permis de détecter certains indicateurs relatifs à une prescription irrationnelle de médicaments par des médecins.

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Introduction

There are comparatively few studies on the use of medication in children in developing countries, where children constitute a large proportion of the population [1]. Studies on drug use patterns in paediatric outpatient clinics over the past decade were reviewed [2,3] and it was found that only one had been conducted in a developing country (Sri Lanka) [4].

The use of drugs in infants presents difficulties and peculiarities relating to their age and development [3]. Based on several studies of children from 0 years to 14 years, drug exposure seems to have a peak at approximately 1 year of age [3,5,6,7].

Most paediatric drugs are used outside of hospitals, both as prescribed and non-prescribed medicines [8]. The first response by families to 50%–70% of illnesses has been found to be a non-prescribed medicine [5]. The nature and extent of self-medication varies in different cultural contexts [6–8] and social and educational influences may be greater than the influence of medical practice [9]. Based on the pattern of drug prescribing by doctors at primary health care centres, many studies have stressed the need for effective educational programmes to improve prescriber decision-making [10–12]. Factors, such as the availability of diagnostic facilities, type of prescriber and lack of refresher training have been shown to influence antibiotic prescribing significantly [13].

In Egypt, the determinants and rationale for drug use among infants has not been previously studied. As a first step we intend to give an overview of the use of prescribed and non-prescribed drugs in infants in Alexandria.

Subjects and methods

Alexandria is the second largest governorate in Egypt, with an estimated population in 1997 of 3 500 000, of which 200 000 were under 1 year old. The Ministry of Health and Population provides the basic health services for the vast majority of pre-school children. Alexandria is divided into six geographic medical zones. Each one has a number of health centres (including outpatient clinics, maternal and child health centres and health offices). Vaccinations are given in health offices as an obligatory and free health service for all infants (covering infants from 0 months to 18 months).

Study population and data collection

In proportion to the number of health centres serving each medical zone, two or three health centres were randomly chosen from each zone (a total of 15 health centres). Interested physicians in charge of the health offices were trained to help interview mothers coming to vaccinate their infants. On randomly selected two days a week, infants attending the selected health offices during the study period (1 month) were included. The questionnaire included demographic information, information on health problems in infants within the past month (a health problem being defined as any ailment in an infant that necessitated help), and different responses in managing these problems (administering non-prescribed medication or seeking medical advice). Also, inquiries were made about what, if any, medications were kept at home.

To study patterns of drug prescriptions, physicians in charge of the 15 selected outpatient clinics were asked to complete sheets which included data about infant age (in months), diagnosis and prescribed medications. These were completed for all in-

fants attending the clinics within the 1-month study period. Drugs included in the questionnaire were coded according to the Anatomical Therapeutic Chemical (ATC) classification index [14].

Study design

A cross-sectional descriptive study was conducted. The response of the mothers to different ailments in infants was assessed through face-to-face interviews with 260 mothers. A data collection sheet was prepared to describe the pattern of physicians' prescriptions given to infants attending outpatient clinics at different health centres and prescriptions for 300 infants were collected.

Results

Non-prescribed medications

In a period of 1 month, 89.6% of mothers stated that their infants had suffered some ailment which necessitated intervention. Out of these, 27.5% had reacted by giving traditional therapies or non-prescribed medication, while 72.5% had sought medical advice. For irritability, the majority of mothers (80.5%) had given traditional home therapies and/or non-prescribed medications. For other ailments (fever, diarrhoea, vomiting, cough), most mothers had sought medical advice (75.0%–88.9%) (Table 1).

Traditional therapies included anise, caraway and cumin seeds, lime leaves and java vapour. These were mainly used for irritability and cough relief but as the interviewer did not get precise answers, accurate figures could not be obtained on whether they were the sole therapy given for the ailment or were followed by a medicine. The total number of non-prescribed drugs given within 1 month was 100 (Table 2). There-

Table 1 Response of mothers to their infants' ailments in the previous month ($n = 260$)^a

Ailment	Administered non-prescribed medication		Sought medical advice	
	No.	%	No.	%
Irritability ^b	33	80.5	8	19.5
Fever ^b	5	21.8	18	78.2
Diarrhoea	7	25.0	21	75.0
Vomiting	2	15.4	11	84.6
Cough	8	16.0	42	84.0
Upper respiratory complaints	6	11.8	45	88.2
Others ^c	3	11.1	24	88.9
Total	64		169	

^aIn 27 infants there were no complaints within the last month that necessitated any treatment

^bSingle complaint

^cIncludes: stomatitis, constipation, skin diseases, ear and eye problems

fore, the average number of non-prescribed medicines given to an infant during its first year of life can be estimated to be 4.6 [(100/260) × 12]. The most frequently used were antispasmodics (47%), followed by antipyretics (13%) (Table 2). Only 3% of self-medications were antibiotics.

Of the 260 mothers interviewed, 167 (64.2%) kept drugs at home to be used when needed. Antipyretics, antispasmodics and cough medicines made up the majority of drugs kept at home (40.6%, 32.0% and 10.3% respectively) (Table 3).

Pattern of physicians' prescribing for infants attending outpatient clinics

For the sample of infants ($n = 300$) attending outpatient clinics during the study period, the most frequent health problems

Table 2 Non-prescribed medications given to infants in the previous month (n = 64)

Drug (ATC classification [14])	No.	%
Antispasmodics (A03A)	47	47.0
Bromides (N05CM11)	3	3.0
Antipyretics (N02B)	13	13.0
Paracetamol (N02BE01)	6	
Paracetamol combination (N02BE51)	3	
Dipyron (N02BA09)	2	
Non-specified (N02B)	2	
Cough and cold preparations (R05)	8	8.0
Theophylline derivatives (R05DB04)	2	
Non-specified (R05)	6	
Antidiarrhoeal (A07)	5	5.0
Oral rehydration solution (A07CA)	4	
Kaolin and pectin (A07BC01)	1	
Antihistaminics	3	3.0
Pheniramine and amonium chloride (R06AB05)		
Antibiotics (J01)	3	3.0
Sulfa and trimethoprim (J01EE01)	1	
Ampicillin (J01CA01)	1	
Non-specified (J01)	1	
Others	18	18.0
Total ^a	100	100.0

^aTotal number of drugs given as non-prescribed medication to 64 infants

were: wheezy bronchitis (24%), bronchitis (23.3%), diarrhoea (16.3%), pharyngitis (12%), tonsillitis (8.3%), pneumonia (3.3%) and others (12.8%). The WHO essential drug list [15] was not available in any of the outpatient clinics studied. The average number of drugs per encounter was 2.0 (607/300) and injections were prescribed in only 16.6% of cases.

Antibiotics were used in 50% of cases with bronchitis and wheezy bronchitis, in

Table 3 Distribution of medications kept at home (n = 260)

Medication	No.	%
Antipyretics	114	40.6
Antispasmodics and antiemetics	90	32.0
Cough syrup	29	10.3
Oral rehydration solution	9	3.2
Kaolin, pectin and other antidiarrhoeal medication	12	4.3
Vitamins	12	4.3
Antibiotics	5	1.8
Others	10	3.5
Total ^a	281	100.0

^aTotal number of medications kept at home does not equal the total number of mothers interviewed because in some cases no medications were kept at home and in others more than one medication was kept.

28.6% of cases with diarrhoea and in 3.5% of cases of the common cold. Amoxycillin was the most commonly used antibiotic in pharyngitis, tonsillitis and wheezy bronchitis. In cases of tonsillitis, penicillin was not prescribed. The duration of antibiotic therapy was less than 7 days in 82.6% of cases of tonsillitis and 60% of pneumonia (Tables 4 and 5).

For infants presenting with diarrhoea, oral rehydration solution was prescribed for 91.8% of cases and antibacterial and metronidazole for 28.6% of cases (Table 6). For infants presenting with fever, physicians prescribed paracetamol in 64.2% of cases, and acetyl salicylic acid and dipyron were prescribed in 25.4% and 10.4% of cases respectively.

Discussion

The main goal of this small sample study was to give an initial, rapid, overview on

Table 4 Antibiotics prescribed by physicians for upper and lower respiratory tract diseases

Antibiotic (ATC classification [14])	Pharyngitis		Tonsillitis		Bronchitis		Wheezy bronchitis		Pneumonia	
	(n = 18) ^a		(n = 25) ^a		(n = 35) ^a		(n = 36) ^a		(n = 10) ^a	
	No.	%	No.	%	No.	%	No.	%	No.	%
Crystalline penicillin (J01CE01)	0	0.0	0	0.0	0	0.0	2	7.1	5	31.3
Ampicillin (J01CA01)	1	6.7	2	8.7	13	76.5	7	25.0	1	6.3
Amoxicillin (J01CA04)	11	73.3	12	52.2	3	17.7	18	64.3	3	18.8
Cephalosporin (J01DA)	0	0.0	0	0.0	1	5.9	0	0.0	1	6.3
Erythromycin (J01FA01)	0	0.0	3	13.0	0	0.0	0	0.0	0	0.0
Sulpha + trimethoprim (J01EE01)	2	13.3	6	26.1	0	0.0	0	0.0	0	0.0
Sulpha (J01ECC02)	1	6.7	0	0.0	0	0.0	0	0.0	0	0.0
Gentamycin (J01GB03)	0	0.0	0	0.0	0	0.0	1	3.8	6	37.5
Total ^b	15	100.0	23	100.0	17	100.0	28	100.0	16	100.0

^aNumber of cases diagnosed

^bThe total number of antibiotics does not equal the total number of patients in each category because in some cases no antibiotics were used and in others more than one antibiotic was used.

medicine (drug) use among infants in Alexandria. We focused on two main areas: first, the reactions of parents when facing ill-health in their infants (covering, in part, the problem of non-prescribed medications) and secondly the patterns of prescribing by physicians working in outpatient clinics, who are the first-line medical care providers for the vast majority of infants in our community.

Non-prescribed medication

This was assessed through interviewing mothers coming to vaccinate their infants. As the health offices involved in this study were randomly selected from all medical zones in Alexandria and vaccination is obligatory for all infants, the studied sample represents a fair cross-section of the total population of infants. Interviewing mothers coming to vaccinate their infants was preferred to a household survey, as it

Table 5 Duration of use of antibiotics in different diseases as advised by physicians

Disease	Duration (days)				Total ^a
	<7		≥7		
	No.	%	No.	%	
Pharyngitis	15	100.0	0	0.0	15
Tonsillitis	19	82.6	4	17.4	23
Bronchitis	17	100.0	0	0.0	17
Bronchial asthma	28	100.0	0	0.0	28
Pneumonia	6	60.0	4	40.0	10
Diarrhoea	13	92.9	1	7.1	14

^aIncludes only infants who received antibiotics

is more convenient and mothers were expected to be more attentive to an interview delivered just before their child's vaccination than during their busy home duties.

Table 6 Medication prescribed by physicians in outpatient clinics for treatment of infants with diarrhoea (n = 49)

Medication (ATC classification [14])	No.	%
Tincture of belladonna and atropine (A03BA04)	4	8.2
Kaolin and pectin (A07BC01)	12	24.5
Antibacterial and metronidazole (J01XD01)	14	28.6
Oral rehydration solution (A07CA)	45	91.8

There were no striking findings in the profile of ailments treated at home as irritability accounted for more than half of these cases. The high percentage of mothers who sought medical advice for minor ailments could be explained by the easy accessibility of free outpatient paediatric clinics in Alexandria. However, encouraging the use of traditional therapies (like herbs which are available at home) to manage simple ailments, such as irritability, coughs and simple upper respiratory complaints (mostly the common cold), could reduce the use of non-prescribed medicines.

A mother's perception and response to different symptoms in her infant are affected by many social and cultural factors, which should be assessed. Also, predictors of the overuse of non-prescribed medication should be subjected to a more detailed analysis.

Pattern of physicians' prescribing to infants

Regarding patterns of prescribing by physicians in paediatric clinics, the following findings in this study could be taken as indicators of irrational drug use in infants.

- Antibiotics were prescribed for a high percentage of infants diagnosed as having diseases well known to be mostly of viral etiology. Antibiotics were prescribed in 50% of cases of wheezy chest, in 50% of cases of simple bronchitis and in cases diagnosed as pharyngitis. It is well known that the use of antibiotics in illnesses of mostly viral etiology is worthless and even harmful, as it may induce more resistance to antibiotics [10]. The use of antibiotics for acute respiratory infections of presumed viral etiology has been reported as a worldwide problem [16-18].
- Despite being the drug of first choice, penicillin was not prescribed at all in those cases diagnosed as tonsillitis. Even erythromycin, which should be the second choice, was used only in 13.0% of these cases.
- Antibiotics were prescribed for less than 1 week in 82.6% of cases of tonsillitis and in more than half of the cases of pneumonia (60%). This indicates under-treatment and an increased risk of developing complications in these cases.
- Despite the positive finding of a high level of use of oral rehydration solution in infants with diarrhoea attending outpatient clinics (91.8%), still the treatment of diarrhoea in infants followed a pattern of multiple drug use. Antibiotics were used in 31.1% of cases, and kaolin and pectin in 24.5% of cases (Table 6). However, it is now firmly established that the treatment for more than 90% of cases of diarrhoea should be limited to rehydration therapy. None of the many available alternative treatments has been proven to be safe or effective [5].
- Corticosteroids were used in only 14 cases of wheezy bronchitis out of 72 diagnosed cases. Assessment of the se-

verity of asthma in these cases would be essential in order to judge if this were undertreatment or not.

- Although paracetamol was the most frequently prescribed antipyretic, acetyl salicylic acid was prescribed for 25.4% of infants presenting with fever and dipyrrone derivatives for 10.5%. This identifies the need for more awareness about the risk of using these drugs in infants.
- Drugs with no documented effect, such as cough syrups and systemic decongestants in infants presenting with

coughs and the common cold were frequently used.

All the above indicators stress the need for an effective education programme and for the provision of the essential drug list to improve physicians' prescribing in primary health care centres in Alexandria.

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