Edilson Almeida de Oliveira[I]

Andréa Dâmaso Bertoldi[I,II]

Marlos Rodrigues Domingues[III]

Iná Silva Santos[II]

Aluísio J D Barros[II]

Medicine use from birth to age two years: the 2004 Pelotas (Brazil) Birth Cohort Study

ABSTRACT

OBJECTIVE: To describe medicine use by children at three, 12 and 24 months of age.

METHODS: Cross-sectional study using data from the 2004 Pelotas Birth Cohort (Southern Brazil), including: 3,985 children at three months, 3,907 children at 12 months, and 3,868 children at 24 months of age. The outcome investigated was use of medicine in the 15 days preceding the interview. Information on independent variables (medicine used, who indicated it, how it was obtained, periodicity of use, and therapeutic group) were collected using a standardized questionnaire administered during a home interview with the child's parents.

RESULTS: Prevalence of medicine use at three, 12, and 24 months was 65.0% (95% CI: 63.5;66.5), 64.4% (95% CI: 62.9;65.9), and 54.7% (95% CI: 53.1;56.2), respectively. As age increased, there was a reduction in the total number of medicines used and an increase in self-medicine, which reached 34% at 24 months. Furthermore, frequency of sporadic medicine use increased, while that of continuous use decreased. Medicine was purchased mainly using private resources, with roughly 10% of drugs being purchased through the Brazilian National Health Care System. The profile of medicine types used also changed with age. The type of medicine most frequently used were dermatological products (36%) at three months; respiratory system drugs (24%) at 12 months; and analgesics (26%) at 24 months of age. Compared to three months, medicine use at 24 months was characterized by decreased use of digestive tract and metabolism drugs, drugs for the sensory organs, cardiovascular system drugs, and dermatological products, and an increase in systemic anti-infectious drugs, medicine for the skeletomuscular and respiratory systems, analgesics, insecticides, and repellents.

CONCLUSIONS: Medicine use in this cohort was high and indicates the need for prioritizing rational use of medicine in early life.

DESCRIPTORS: Drug Utilization. Infant. Cohort Studies.

INTRODUCTION

According to data from the World Health Organization, over 50% of medicines are improperly prescribed or sold, approximately ⅓ of the population does not have access to essential medicines, and 50% of patients do not take their medicines correctly.[a]

[a] Organización Mundial de la Salud. Promoción del uso racional de medicamentos: componentes centrales. Ginebra; 2002. (Perspectivas políticas sobre medicamentos de la OMS, 5).

[I] Programa de Pós-Graduação em Saúde Coletiva. Universidade do Vale do Rio dos Sinos. São Leopoldo, RS, Brasil

[II] Programa de Pós-Graduação em Epidemiologia. Departamento de Medicina Social da Faculdade de Medicina. Universidade Federal de Pelotas (UFPel). Pelotas, RS, Brasil

[III] Programa de Pós-Graduação em Educação Física. Departamento de Desportos. Escola Superior de Educação Física. UFPel. Pelotas, RS, Brasil

Correspondence:
Andréa Dâmaso Bertoldi
Universidade do Vale do Rio dos Sinos
Av. Unisinos, 950
93022-000 São Leopoldo, RS, Brasil
E-mail: andreadamaso.epi@gmail.com

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International studies indicate that medicine use is high during childhood,[14,24] especially among children aged under two years.[17,25] Moreover, a study carried out in the United States between 2002 and 2005 showed that chronic use of several drug groups is on the rise.[7]

The supply of over-the-counter medicines, associated with self-medication, can lead to improper use. In the United Kingdom, use of ineffective drugs for treating childhood fever is frequently reported by parents.[21]

WHO restricts the use and indication of a number of medicines widely in use by Brazilian children.[b] By three months of age, 69% of children from the state of Rio Grande do Sul, Southern Brazil, used medicines, most frequently acetylsalicylic acid, benzalkonium chloride/saline, and dimethicone/homatropine; combinations of three or more medicines were used by 19% of children, and prevalence of chronic medicine use was as high as 20%.[26]

Data from the National Toxic-pharmacological Information System (SINITOX) show that excessive medicine use at young ages is a reason for concern: medicine-related intoxications increased from 15% in 2000 to 29% in 2005, children under the age of five years being the greatest victims (35% of cases).[c] In 2007, medications were the most frequent cause of intoxication in Brazil, with an average of more than 20 children intoxicated per day.[d]

The aim of the present study was to describe medicine use among children at ages three, 12, and 24 months.

METHODS

We analyzed data from a birth cohort conducted in the city of Pelotas, Southern Brazil, in 2004. The cohort included all children born in 2004 to mothers living in the urban area of the municipality of Pelotas and in the Jardim America neighborhood, contiguous to Pelotas but officially located in the municipality of Capão do Leão. According to 2007 data from the Brazilian Institute of Geography and Statistics (IBGE), the population of Pelotas is of 339,934 inhabitants, with a *per capita* gross domestic product (GDP) of R$ 8,248.00. The population of Capão do Leão is 23,655 inhabitants, with a *per capita* GDP of R$ 9,022.00.[e]

In 2004, 4,287 children were born in Pelotas, of which 4,231 were live births. In the first 24 hours after deliver, mothers were invited to participate in a birth cohort study. The first interview with the mother and the measurement of the newborn were carried out at this moment. When the children completed three, 12, and 24 months of age, they were interviewed again at home. The study included 3,985 children at the three-month, 3,907 at the 12-month, and 3,868 at the 24-month follow-ups. Excluding deaths, follow-up rates were 95.7%, 94.3%, and 93.5%, respectively. From the beginning of the study to the 24-month visit, losses and refusals totaled 6.5% (274 children). Further methodological details, including characteristics of the sample, have been published elsewhere.[3,23]

The outcome analyzed was medicine use by the children at three, 12, and 24 months of age, irrespective of reason, indication, or therapeutic group. In all follow-ups we asked whether the child had received any medicines in the last 15 days. We then asked for the names of the medicines used and for the packages and prescriptions if available. We also investigated the following:

- reason for use;
- source of indication (current medical prescription; previous medical prescription, which characterized the reuse of a previously used medical prescription; other health worker; mother; family/friend; or other);
- form of acquisition (private resources, provided by the National Healthcare System (SUS); or other source;
- regularity of use, categorized as sporadic (non-regular use in the last 15 days) or continuous (used every day for one month or more).

Self-medication was defined as medicine use based on a previous medical prescription or on indication by a non-physician.

Medicines used were classified according to levels 1 (anatomical group) and 2 (therapeutic group) of the Anatomical Therapeutic Chemical (ATC) classification, as recommended by WHO.[f] In this system, medicines are divided into groups according to the organ or system on which they act and to their chemical, pharmacological, and therapeutic properties. Based on the reason for which they were used, medicines were classified according to the first two ATC levels. Medications for which information on reason for use

[b] World Health Organization. WHO Model list of essential medicines for children. 2007 [cited 2010 May 24] Available from: http://www.who.int/childmedicines/publications/EMLc%20(2).pdf
[c] Sistema Nacional de Informação Tóxico Farmacológica – SINITOX. 2004 [cited 2010 May 24] Available from: http://www.fiocruz.br/sinitox/2004
[d] Agência Fiocruz de Notícias. SINITOX. Sistema Nacional de Informação Tóxico Farmacológica. 2007 [cited 2010 May 24] Available from: http://www.fiocruz.br/ccs/cgi/cgilua.exe/sys/start.htm?infoid=1211&sid=9
[e] Instituto Brasileiro de Geografia e Estatística. 2007 [cited 2010 May 24] Available from: http://www.ibge.gov.br/cidadesat/topwindow.htm?1
[f] WHO Collaborating Centre for Drug Statistics Methodology. Anatomical therapeutic chemical (ATC) classification index with defined daily doses (DDDs). Oslo, 1998.

was unavailable were included in the "no classification for ATC level 2" category. Medications included in group "N02 – analgesics" (ATC level 2) are described in the text as analgesics/antipyretics, given that all medicines reported belonged to group N02B (level 3), which refers to non-opioid analgesics.

Analyses included presentation of absolute and relative values for variables of interest in all three follow-ups. Prevalence and number of medicines administered to children was calculated using the number of children in each follow-up as a denominator. For the remaining analyses, the denominator for proportions was the total number of medicines used by children in each follow-up. We performed chi-squared tests to assess the significance of differences in proportions between the three follow-ups, adopting a significance level of 5%.

Data entry was carried out using EpiInfo 6.0 software. Entry validation, consistency and variable creation processes, and all analyses were carried out using the Stata 9 statistical package.

All stages of the 2004 Pelotas birth cohort were approved by the Research Ethics Committee of the Faculdade de Medicina da Universidade Federal de Pelotas (process no. 4.06.00.006, approved on 20 June 2006 and process N.. 4.06.01.113, approved on 9 March 2005). Interviews and examinations were conducted only after obtaining written consent by parents and or caregivers.

RESULTS

Of the 4,321 children originally enrolled in the birth cohort in 2004, roughly 40% were first-borns, 10% were low birthweight, 85% were born at term, and approximately 55% were delivered vaginally. The majority of mothers was in the 20-29 years age range, had between five and eight years of schooling, did not have private health insurance (pre-paid health plans), and had their deliveries paid for by SUS.

Prevalences of medicine use at three, 12, and 24 months were 65.0% (95%CI: 63.5;66.5), 64.4% (95%CI:

Table 1. Distribution of medicine use by children according to number of medicines used, source of indication, form of acquisition, and regularity of use. Municipality of Pelotas, Southern Brazil, 2004-2006.

Variable	Age					
	3 months		12 months		24 months	
	n	%	n	%	n	%
N° of medicines used per child[a]						
0	1,395	35.0	1,391	35.6	1,754	45.3
1	1,064	26.7	1,158	29.7	1,060	27.4
2	778	19.5	716	18.3	591	15.3
3	391	9.8	348	8.9	247	6.4
4	197	5.0	155	4.0	119	3.1
≥5	160	4.0	138	3.5	97	2.5
Source of indication						
Current medical prescription	4,858	88.7	3,734	74.1	2,632	66.0
Prior medical prescription	284	5.2	568	11.3	737	18.4
Other health care professional	22	0.4	56	1.1	57	1.4
Mother	145	2.6	537	10.7	481	12.0
Family/friend	151	2.8	126	2.5	77	1.9
Other	15	0.3	15	0.3	13	0.3
Form of acquisition						
Private resources	4,536	83.2	4,160	82.8	3,418	85.9
National Health Care System (SUS)	517	9.5	619	12.3	368	9.3
Other sources	398	7.3	245	4.9	189	4.8
Regularity of use						
Sporadic	3,796	69.3	3,942	78.3	3,433	85.8
Continuous	1,681	30.7	1,096	21.7	569	14.2
Total children interviewed	3,985		3,907		3,868	
Total no. of medicines used	5,477		5,040		4,002	

[a] This variable uses as denominator the number of children in each follow-up. The remaining variables use as denominator the total number of medicines used.

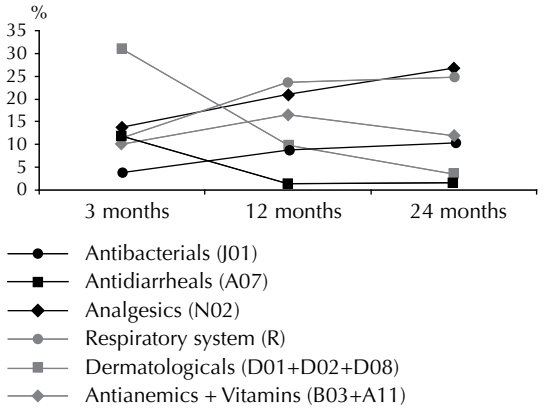

Figure. Profile of medicines most frequently used at three, 12, and 24 months of age. Municipality of Pelotas, Southern Brazil, 2004-2006.

62.9;65.9), and 54.7% (95%CI: 53.1;56.2), respectively. As shown in Table 1, even considering the small reduction in the total number of children in the sample between the three and 24-month visits, the total number of medicines used decreased by 27% as age increased. Absence of medicine use remained constant at three and 12 months ($p = 0.59$), but increased by 10 percentage points at 24 months ($p < 0.001$). Use of two or more medicines decreased as age increased ($p < 0.001$).

Frequency of self-medication increased with age, reaching 11%, 26%, and 34% at three, 12, and 24 months, respectively ($p < 0.001$). Reuse of previous prescriptions increased from 5.2% at three months to 18.4% at 24 months. Frequency of mothers as the source of indication increased from 2.6% at three months to 10.7% at 12 months and 12.0% at 24 months ($p < 0.001$) (Table 1).

Regarding the form of acquisition, more than 80% of medicines used were purchased using private resources, and approximately 10% were obtained for free through SUS (Table 1). Among the medicines most used in the three follow-ups, SUS participation was highest for the acquisition of antiinfectives (38%) and vitamins/antianemics (29%), followed by medicines for the respiratory tract (15%) and analgesics/antipyretics (10%). Lower SUS participation was observed for dermatologicals and antidiarrheals (5%).

Regarding regularity, sporadic use was predominant in all follow-ups, and increased gradually from three to 24 months. Frequency of continuous use, on the other hand, fell by roughly 50% from three to 24 months ($p < 0.001$) (Table 1).

Analysis by therapeutic group (Table 2) showed that medicines most frequently used at three months included three subgroups of dermatologicals: D01 – antifungals, D02 – emollients and protectives, and D08 – antiseptics and disinfectants (31%); analgesics/antipyretics (N02 = 13.5%), antidiarrheals, anti-inflammatory agents, and intestinal antiinfectives (A07 = 11.8%); and respiratory tract medicines as a whole (R = 11.0%). At 12 months, 23.5% of medicines used were for the respiratory system (R), followed by analgesics/antipyretics (N02 = 20.5%), antianemics and vitamins (A11 + B03 = 16.3%), dermatologicals (D01 + D02 + D08 = 9.7%), and systemic antiinfectives (J = 8.7%). At 24 months, analgesics/antipyretics (N02) continued to be the most used products (26.0% of all medicines consumed), followed by medicines for the respiratory system (R = 24.5%), antianemics and vitamins (A11 + B03 = 11.6%) and antiinfectives for systemic use (J = 10.0%).

Analysis of changes in use between age three and 24 months, considering only the first ATC level, showed that use of alimentary tract and metabolism medicines fell by approximately 54%, of dermatologicals by ≈84%, of medicines for sensory organs by ≈52%, and of medicines for the cardiovascular system by ≈75%. On the other hand, use of systemic antiinfectives increased by almost three-fold, of musculo-skeletal drugs by ≈10-fold, of analgesics by ≈two-fold, of antiparasitics, insecticides, and repellents by ≈17-fold, and of medicines for the respiratory system by ≈two-fold (Table 2). The Figure shows the change in the profile of frequently used medicines with time according to the second ATC level.

DISCUSSION

Prevalence of medicine use at the three- and 12-month follow-ups of the 2004 Pelotas Birth Cohort was approximately 65%. At 24 months, prevalence of medicine use was 55%. These data are similar to those reported by the Avon Longitudinal Study of Parents and Children, carried out in England, in which ¾ of children were exposed to some type of medicine use before age two months.[14] In another study carried out in the United Kingdom, 96% of mothers reported that their children had taken medicines (vaccines excluded) in the first six months of life.[11] A German study reported that 50.8% of children and adolescents had used at least one medicine in the seven days preceding the interview, with higher prevalence among children aged zero to two years (74.9%).[15] Use of over-the-counter medicines among preschool children was 66.7% in the United States.[16] In another birth cohort from the same city (1982 Pelotas Birth Cohort), prevalence of overall medicine use reached 56% among children aged 35 to 53 months.[4]

[g] World Health Organization. The role of the pharmacist in self-care and self-medication. Hague; 1998. (Report WHO/DAP/98.13).
[h] Ministério da Saúde. Portaria MS/GM Nº 3.916, de 30 de outubro de 1998. [Aprova a política nacional de Medicamentos]. Brasília, DF; 1998.

Table 2. Medicines used at each age according to the Anatomical Therapeutic Chemical Classification System, levels 1 and 2. Municipality of Pelotas, Southern Brazil, 2004-2006.

Classification	Age at follow-up					
	3 months		12 months		24 months	
	n	%	n	%	n	%
A – Alimentary Tract and Metabolism	1,444	26.5	680	13.5	485	12.2
A01 Stomatological preparations	-	-	4	0.1	2	0.1
A02 Drugs for acid related disorders	45	0.8	36	0.7	19	0.5
A03 Drugs for functional gastrointestinal disorders	180	3.3	72	1.5	33	0.8
A04 Antiemetics and antinauseants	2	0.04	27	0.5	48	1.2
A06 Laxatives	4	0.1	7	0.1	11	0.3
A07 Antidiarrheals, intestinal anriinflammatory/antiinfective agents	642	11.8	65	1.3	57	1.4
A11 Vitamins	301	5.5	338	6.7	208	5.2
A12 Mineral supplements	16	0.3	70	1.4	30	0.8
Without ATC level 2 classification	254	4.7	61	1.2	77	1.9
B – Blood and blood forming organs	251	4.6	489	9.7	257	6.4
B03 Antianemic preparations	248	4.5	486	9.6	257	6.4
B06 Other hematological agents	3	0.1	1	0.02	-	-
Without ATC level 2 classification	-	-	2	0.04	-	-
C – Cardiovascular therapy	12	0.2	5	0.1	2	0.05
C01 Cardiac therapy	2	0.04	2	0.04	-	-
C03 Diuretics	7	0.1	2	0.04	1	0.025
C09 Agents acting on the renin-angiotensin system	3	0.1	1	0.02	1	0.025
D – Dermatologicals	1,959	35.9	703	14.0	226	5.7
D01 Antifungals for dermatological use	559	10.2	146	2.9	55	1.4
D02 Emollients and protectives	524	9.6	333	6.6	73	1.8
D03 Preparations for treatment of wounds and ulcers	13	0.2	10	0.2	6	0.15
D04 Antipruritics, including antihistamines, anesthetics, etc&	10	0.2	38	0.8	16	0.4
D06 Antibiotics and chemotherapeutics for dermatological use	30	0.6	30	0.6	14	0.4
D07 Corticosteroids, dermatological preparations	116	2.1	71	1.4	26	0.65
D08 Antiseptics and disinfectants	599	11.0	8	0.2	7	0.18
D11 Other dermatological preparations	-	-	-	-	1	0.025
Without ATC level 2 classification	108	2.0	67	1.3	28	0.7
H – Systemic hormonal preparations excluding sex hormones and insulin	39	0.7	106	2.1	64	1.6
H02 Corticosteroids for systemic use	39	0.7	106	2.1	64	1.6
J – Antiinfectives for systemic use	205	3.8	439	8.7	399	10.0
J01 Antibacterials for systemic use	201	3.7	433	8.6	395	9.9
J04 Antimycobacterials	-	-	1	0.02	1	0.03
J05 Antivirals for systemic use	2	0.04	-	-	3	0.08
J07 Vaccines	2	0.04	-	-	-	-
Without ATC level 2 classification	-	-	5	0.1	-	-
L – Antineoplastic and immunomodulating agents	-	-	3	0.1	6	0.15
Without ATC level 2 classification	-	-	3	0.1	6	0.15
M – Musculo-skeletal system	38	0.7	202	4.0	259	6.5
M01 Antiinflamatory and antirheumatic products	38	0.7	202	4.0	259	6.5

To be continued

Table 2 continuation

Classification	Age at follow-up					
	3 months		12 months		24 months	
	n	%	n	%	n	%
N – Nervous system	760	14,0	1.058	21,0	1.075	26,9
N02 Analgesics	738	13,5	1.031	20,5	1.037	26,0
N03 Antiepileptics	19	0,4	16	0,3	31	0,8
N05 Psycholeptics	-	-	-	-	1	0,03
Without ATC level 2 classification	3	0,1	11	0,2	6	0,15
P – Antiparasitic products, insecticides and repellents	16	0.3	90	1.8	195	4.9
P01 Antiprotozoals	-	-	17	0.3	22	0.6
P02 Anthelmintics	1	0.02	69	1.4	157	3.9
P03 Ectoparasiticides, including scabicides, insecticides and repellents	14	0.3	-	-	4	0.1
Without ATC level 2 classification	1	0.02	4	0.1	12	0.3
R – Respiratory system	600	11.0	1,186	23.5	979	24.5
R01 Nasal preparations	136	2.5	191	3.8	262	6.5
R02 Throat preparations	-	-	2	0.04	13	0.3
R03 Drugs for obstructive airway diseases	135	2.5	367	7.3	154	3.9
R05 Cough and cold preparations	176	3.2	275	5.5	226	5.7
R06 Antihistamines for systemic use	32	0.6	128	2.5	115	2.9
Without ATC level 2 classification	121	2.2	223	4.4	209	5.2
S – Sensory organs	123	2.3	77	1.5	44	1.1
S01 Ophthalmologicals	58	1.1	29	0.6	25	0.6
S02 Otologicals	64	1.2	41	0.8	14	0.4
S03 Ophthalmological and otological preparations	-	-	3	0.06	-	-
Without ATC level 2 classification	1	0.02	4	0.08	5	0.1
V – Various	1	0.02	-	-	-	-
V06 General nutrients	1	0.02	-	-	-	-
Total	5,448	100.0	5,038	100.0	3,991	100.0

Self-medication, defined by WHO as the selection and use of medicine by individuals in order to treat self-recognized disorders or symptoms,[g] is characterized by the use of medicine without due prescription, orientation, or follow-up by a physician or dentist.[h] Its occurrence was observed in the present study, especially when originating from a prior medical prescription, from another health professional, or from mother, family/friends, or other. Occurrence of self-medication was higher at age 24 months (34%). Though medicine use based on a current prescription fell as age increased (from 89% at three months to 66% at 24 months), these frequencies were still higher than those reported in another study on medicine use from the 1982 Pelotas Birth Cohort. In the latter study, which used a similar methodology, 62% of medicines used by children aged 35 to 53 months were prescribed by a physician.[4] This finding suggests that self-medication increases along with age, at least in children up to age two years.

A cross-sectional study investigating self-medication among children and adolescents in two municipalities in the state of São Paulo, Southeastern Brazil, identified the occurrence of self-medication in 56.6% of the sample, with mothers being the primary source of indication (51%).[20] In the current study, mothers accounted for 12.0% of self-medication at 24 months (having increased from 2.6% at three months). Such an increase may indicate that mothers learn and incorporate treatment practices originally recommended by a physician, but which may not always be adequate to the current situation.[6]

According to a study of Australian children, self-medication is facilitated by the availability of over-the-counter medicines, which are widely used even though there is no evidence regarding their efficacy or information on potential risk of toxicity.[1] Over-the-counter medicines, especially those for cold and flu symptoms, carry the risk of overdose, underdose, and adverse effects. In a study conducted in the United States, 1,500 children were treated for adverse effects related to over-the-counter flu and cold medicines in an emergency facility over a period of two years.[22] There

are no data supporting the use of over-the-counter medicines by young children, although this practice remains common. To assess the true extent of the risk associated with inadequate medicine use upon self-medication, it will be essential to consider the type of medicine used.

Given the population-based nature of the present study, we highlight the low percentage of medicines provided free of charge (by SUS) and the high proportion of medicines purchased using private resources. These data indicate that, also in early childhood, the first option when purchasing medicine is out-of-pocket expenditure, as reported by other studies on access to medicines and related costs in Brazil.[5,18]

Continuous medicine use decreased with age, from 30.7% at three months to 14.2% at 24 months. Even so, continuous use at three months was 50% higher than that found in a prior cohort, in which uninterrupted use for one month or longer was found to occur in 20% of children.[26] This difference may be related to changes in prescription practices caused by changes in morbidity profile, given the 11-year interval between the two cohorts. A survey carried out in the United States showed that prevalence of continuous medicine use among children increased between 2002 and 2005 for a number of different therapeutic classes, and that this trend may be related to increased risk factors for chronic diseases.[7]

The higher frequency of use of dermatologicals at age three months is in agreement with results from a population-based study of English two-year-olds.[14] In a cohort study carried out in three European countries (Italy, United Kingdom, and the Netherlands), the medicines most used among children up to two years of age were antiinfectives, followed by medicines for the respiratory system, dermatologicals, and analgesics.[25]

Use of analgesics/antipyretics increased with age, reaching 26.0% at 24 months. One of the analgesics used was acetylsalicylic acid (3.7%, 10.6%, and 9.5% of analgesics used at three, 12, and 24 months, respectively). This finding is concerning, since this drug can trigger Reye's syndrome in children with viral infections.[10] Other questionable usage patterns include the use of antidiarrheics at three months, and of antiinflammatories at 12 months of age. Antidiarrheic use is contraindicated in children, and oral rehydration therapy (OHT) is recommended by the Brazilian Ministry of Health since 1982 for the treatment of diarrhea.[19] Prevention is still the most important measure in the management of diarrheal diseases, and includes, among other measures, proper sanitation, methods for food processing and preparation, sanitary water supplies, proper hand hygiene, and sanitary sewage disposal.[8]

Changes in medicine use profile across the three follow-ups reflect changes in epidemiological, morbidity, and care profiles at each of these ages. A study of children up to four years of age in the São Paulo Metropolitan Area, carried out in 1994-95, found that the most frequent morbidities among infants were respiratory diseases, diarrhea, dermatological problems, and infectious diseases. These same diseases showed the highest prevalence among children aged one to four years; however, the frequency of infectious diseases increased.[9] The English study[12] of symptoms and medical appointments among preschool children found that the most frequent symptoms across three age groups (< six months; six to 17 months; 18 to 29 months) were those related to the respiratory system (cold and cough), the frequency of which increases with age. Symptoms related to alimentary tract and metabolism (cramps, diarrhea, and vomiting) were more frequent among younger children. Although fever was common at all ages, its frequency tended to increase with age.

WHO restricts the use and recommendation of a number of drugs widely used in Brazilian children, such as, ibuprofen, paracetamol, procaine benzylpenicillin, trimethoprim, and promethazine, among others. Regarding antiinflammatories, WHO recommends ibuprofen use only by children older than three years of age, and paracetamol is contraindicated as an antiinflammatory due to the lack of proven benefit.[b] All of these medicines were used in all three follow-ups, some of which (ibuprofen, paracetamol, and trimethoprim) widely.

Among the limitations of the present study, there is the possibility of recall bias, which we attempted to overcome by the adoption of a 15-day recall period. Occasional imprecision in identifying the medicines used by children based on the mother's report was minimized by asking the mother to present the prescription or the packaging of the drug (in the three follow-ups, packaging was presented for over 55% of drugs reported).

The issue of when and what medicine should or not be used by a child for a given set of clinical symptoms is long-standing. Medicine use requires clinical bases and pharmacological justification, since, as reported in a study of prevalence of symptoms and medical appointments among preschoolers, fever and respiratory and gastrointestinal symptoms are common in early life.[12] Therefore, parents should be oriented to use the minimum necessary treatment, since concomitant use of two drugs increases the risk of overdose, underdose, and adverse effects, in addition to increasing expenditure and leading to greater medicalization of children.[13]

Medicines require special attention, since they can be potentially beneficial when used rationally, but may lead to potential risk when used without the adequate measures.[2]

The high prevalence of medicine use among children indicates a need for promoting rational use – i.e., use that takes into account cost-benefit relationships – in this age group. Knowledge of the profile of medicine use in a population-based study of longitudinal character may contribute towards the establishment of public policies in this area, aimed at ensuring access to necessary medicines while reducing their inappropriate use.

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