Prevalence of chronic constipation in children
at a primary health care unit

Ieda Regina Lopes Del Ciampo,1 Lívia C. Galvão,2
Luiz A. Del Ciampo,3 Maria I.M. Fernandes4

Abstract

Objective: to study the frequency of chronic constipation in childhood at a Primary Health Care Unit and to observe its characteristics in this population.

Methods: the sample consisted of 313 children aged between one and 10 years treated at the Centro de Saúde Escola, in the district of Tibério, in the town of Ribeirão Preto. Among these, 84 children with chronic constipation were selected. The chi-squared test was used to compare the groups of constipated and nonconstipated children (p = 0.01).

Results: the prevalence of chronic constipation was 26.8%. In the group of chronic constipation, 85.7% of the children had hardened stools, 25% showed reduction in fecal mass, 17.9% had an interval between evacuations longer than 2 days (constipated children), 14.3% revealed fecal soiling and 21.4% presented blood in stools.

Conclusion: the prevalence of chronic constipation was high and the interval between evacuations was as an important diagnostic criterion for the selection of constipated children.


Introduction

Intestinal constipation is a common problem during infancy and is the main complaint in 3% of routine pediatric consultations.1 In infancy, chronic functional constipation is extremely common, accounting for 95% of all cases,2 and its prevalence in the community has merited the greatest concern on the part of researchers during the last decade, particularly in our country,3-6 with an increase in scientific publications on the topic, which denotes a high prevalence, varying from 14.7% to 36.5%. The issue of the prevalence of constipation of infants at a community level was explored to a greater depth in Brazilian medical literature than in international publications, as emphasized in a recent review of intestinal constipation in infants.7 The amount of international research dedicated to the prevalence of constipation in pediatric patients is still smaller, and the
The large variation in high prevalence rates found may possibly be due to the diversity of criteria established by different authors to define constipation.

Particularly in recent years, various definitions for intestinal constipation have surfaced, in an attempt to increase the specificity of its early diagnosis. In 1984, the Brazilian Society for Pediatric Gastroenterology and Nutrition (SBGPN) defined intestinal constipation as a syndrome that consists of the elimination, with effort, of dry or overly dense stools, irrespective of the period of time between evacuations.\(^{10}\)

More recently, the North American Society for Pediatric Gastroenterology and Nutrition defined intestinal constipation as retardation of or difficulty with defecation for two or more weeks sufficient to cause significant discomfort to the patient.\(^{11}\)

Currently, an international work group considered intestinal constipation to be a symptom, defined by the occurrence of any one of the following manifestations, irrespective of the period between evacuations: elimination of hard or scybalous stools, flint-shaped or cylindrical with fissures, difficulty with evacuation or pain when evacuating, sporadic elimination of a large volume of feces, clogging the toilet, or an evacuation frequency of fewer than three times a week, except in infants who are exclusively breastfed.\(^{12}\)

Taking into consideration the fact that in 1996, when the data collection for the present study was carried out, those publications which, in this country, have specified the criteria for intestinal constipation were still emerging, the authors created their own criteria too, attempting to take into account the definition of the Brazilian Society for Pediatric Gastroenterology and Nutrition. The current study had as objectives to study the prevalence of chronic functional intestinal constipation (CFIC) in the infant population of a basic health unit and to observe its main clinical characteristics.

### Methods

The study was undertaken at the Centro de Saúde Escola de Vila Tibério, one of the basic health units of the School of Medicine of Ribeirão Preto of the Universidade de São Paulo, from March/96 to February/97.

This is an illustrative cross-sectional prevalence study with structured interviews answered by the responsible adults who accompanied the children. The interview was partially adapted from a questionnaire used in a study performed on medical students, who replied to the questions themselves.\(^{13}\)

Using the program Epi info, version 6, a representative sample was calculated and then selected, of 24% of the population (313 children) from those with ages between one year completed and ten years incomplete, with active medical records and having visited the health center within the twelve months prior to the interview (1,390 children).

The interviews were performed by a single interviewer, who interviewed during four different periods of the week (Mondays and Fridays, morning or evening). The periods were decided by drawing lots every week in order to avoid a bias, following the theory that constipated individuals might attend the health unit on data collection days once they found out that a study into constipation was being conducted.

The children included in the study fulfilled the following criteria: there should be consent from the guardian to inclusion in the study, they should live within the area served by the health unit, have a medical record at this health unit, have had three or more routine medical consultations there, be in good general health when the interview took place, be accompanied by the mother or the person who spends most time with the child, have no illnesses or medication which result in a predisposition to intestinal constipation.

The sample to be studied was divided into two groups (constipated and not constipated) according to the criteria for constipation definition (Table 1) established by the authors, taking into consideration the paucity of studies that define the criteria for the establishment of intestinal constipation in our setting, at the time of the data collection.

The chi-squared (\(\chi^2\)) test was applied to compare the two groups (significance = 0.01), and Fisher’s exact test when it was impossible to perform the first test.

The project was analyzed and approved by the local Ethics Committee in February/96.

### Results

The median age of the 313 children was 4 years and there was no difference related to age between the 84 constipated children (median 3.5; 1-10) and the 229 nonconstipated ones (median 4.0; 1-10).

The prevalence of chronic intestinal constipation was 26.8% (84/313), of which 27.6% were male and 26.1% female.

The results relating to evacuation characteristics are shown in Table 2.

Initially, the variables “dry cylindrical stools” (44% constipated; 11.9% not constipated) and “fragmented stools” (41.7% constipated; 8.7% not constipated) were analyzed separately, however, as there was no significant difference between the two groups they were joined to make a single variable “hardened stools” (dry cylindrical or fragmented), which was found to be present in 85.7% (72/84) of the constipated children.

The age at which intestinal constipation started for each of the 84 constipated children was investigated, and it was...
found that for 30 (46.9%) children intestinal constipation had started before one year of age.

**Discussion**

The results of this study suggest a CFIC prevalence of 26.8%, which falls within the wide range of 2 to 36.5% found by other authors, using different methodologies, both in their methods of obtaining data and in their selection of the study population. The present study is part of the body of work, the majority published since 1988, which considers the prevalence of intestinal constipation in specific groups of children, taking samples from basic health units, general pediatric clinics or teaching institutions, whose populations are considered representative of the pediatric population.

The prevalence of CFIC found by the present study is close to the 25% found at the General Pediatrics Clinic of the School of Medicine of Botucatu and a little higher than the 20.6% found at the Pediatrics Clinic of Presidente Vargas Children’s Hospital (252 children with no digestive complaints), which could be due to the fact that “no digestive complaints” was not used as an inclusion criterion. The highest prevalence, 36.6%, observed at the Unified Health System clinics and at the Hospital de Clínicas de Porto Alegre-RS, could be due to differences in the judgment of intestinal constipation in specific groups of children, taking samples from basic health units, general pediatric clinics or teaching institutions, whose populations are considered representative of the pediatric population.

The prevalence of CFIC found by the present study is close to the 25% found at the General Pediatrics Clinic of the School of Medicine of Botucatu and a little higher than the 20.6% found at the Pediatrics Clinic of Presidente Vargas Children’s Hospital (252 children with no digestive complaints), which could be due to the fact that “no digestive complaints” was not used as an inclusion criterion. The highest prevalence, 36.6%, observed at the Unified Health System clinics and at the Hospital de Clínicas de Porto Alegre-RS, could be due to differences in the judgment of intestinal constipation in specific groups of children, taking samples from basic health units, general pediatric clinics or teaching institutions, whose populations are considered representative of the pediatric population.

In the USA, an intestinal constipation prevalence of 2% in an epidemiological study (data collection by home interview, national, hospital and clinic records and vital statistics) could have been underestimated, as the records used may not have contained the correct diagnosis if individuals referred only to complications.

In the analysis of stool consistency, it was observed that, probably, the criteria used in this study were too rigorous while the requisites referring to “stools of increased consistency” was still split into dry cylindrical stools and fragmented stools. Thus, the frequency observed between the two groups was not significant. However once these two requisites were joined, the high frequency of constipated children (85.7%) with stools of increased consistency (44% dry cylindrical and 41.7% fragmented) became significant, being consistent with the author who found that 66.6% (69.5% of males and 63.7% of females) of the 330 constipated children (rigorous criteria) eliminated scybalous stools, in a study carried out on 1,145 children from five elementary schools located in the outskirts of Botucatu, state of São Paulo.
Paulo. This demonstrated that the aspect “stools of increased consistency” (dry cylindrical stools + fragmented stools) would have been a more adequate criterion for the diagnosis of CFIC. The combination of both criteria in question does not invalidate the results, since, in addition to being exclusive, they were major criteria and the classification of CIC consists of the presence of one major symptom and two minor ones or two major symptoms.

The significant frequency of children with increased fecal volume is consistent with review studies that refer to the high prevalence of voluminous stools in children with CIC. The high frequency of constipated children with a reduction in fecal volume could correspond to the incomplete elimination of fecal content (partial evacuation), which occurs in some constipated children.

All the children who evacuated at intervals of 2 days or more were constipated, as the frequency was an important criterion for the classification of CFIC. This finding permits the suggestion of modifications to the diagnostic criteria for CFIC adopted in this research, making “frequency greater than or equal to 2 days” a major criterion. No studies of constipation in communities or at basic health units that observed the interval between evacuations could be found, which renders comparison impossible.

Frequencies of alterations related to stool elimination (soiling, bleeding etc.) at general pediatric clinics were consistent with those for this study. Soiling was found in 11.5% of 252 children from one month to 15 years old, at the pediatric clinic of the Presidente Vargas Children’s Hospital, close to the 14.3% observed in this study. Pain

<table>
<thead>
<tr>
<th>Evaluated criteria</th>
<th>Constipated</th>
<th>Non constipated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>84 (26.8%)</td>
<td>229 (73.2%)</td>
</tr>
<tr>
<td>Stool consistency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry (dry cylindrical/ fragmented)</td>
<td>72 (85.7%) †</td>
<td>45 (19.7%) †</td>
</tr>
<tr>
<td>Normal (pastelike)</td>
<td>10 (11.9%)</td>
<td>146 (63.7%) †</td>
</tr>
<tr>
<td>Soft (semi-liquid/ liquid)</td>
<td>2 (4.2%)</td>
<td>28 (12.2%)</td>
</tr>
<tr>
<td>Not informed*</td>
<td>0 (0%)</td>
<td>10 (4.4%)</td>
</tr>
<tr>
<td>Stool volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased</td>
<td>17 (20.2%) †</td>
<td>15 (6.6%)</td>
</tr>
<tr>
<td>Normal</td>
<td>46 (54.8%)</td>
<td>190 (83 %) †</td>
</tr>
<tr>
<td>Reduced</td>
<td>21 (25%) †</td>
<td>12 (5.2%)</td>
</tr>
<tr>
<td>Not informed*</td>
<td>0 (0%)</td>
<td>12 (5.2%)</td>
</tr>
<tr>
<td>Interval between evacuations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2 days</td>
<td>69 (82.1%) †</td>
<td>227 (99.1%)</td>
</tr>
<tr>
<td>≥ 2 days</td>
<td>15 (17.9%) ‡</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Not informed*</td>
<td>0 (0%)</td>
<td>2 (0.9%)</td>
</tr>
<tr>
<td>Anal bleeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>18 (21.4%) ‡</td>
<td>1 (0.4%)</td>
</tr>
<tr>
<td>no</td>
<td>66 (78.6%)</td>
<td>228 (99.6%)</td>
</tr>
<tr>
<td>Fecal soiling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>12 (14.3%) ‡</td>
<td>3 (1.3%)</td>
</tr>
<tr>
<td>no</td>
<td>72 (85.7%)</td>
<td>226 (98.7%)</td>
</tr>
<tr>
<td>Pain during evacuation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>42 (50%) ‡</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>no</td>
<td>42 (50%)</td>
<td>229 (100%)</td>
</tr>
<tr>
<td>Difficulty to evacuate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>77 (91.6%) †</td>
<td>7 (3%)</td>
</tr>
<tr>
<td>no</td>
<td>7 (8.4%)</td>
<td>222 (97%)</td>
</tr>
</tbody>
</table>

† \(\chi^2 (p < 0.01)\).
‡ Fischer’s exact test \(p < 0.01\).
* Note: some questions were not answered due to lack of information, however, this did not have any important effect on the established selection criteria or on the data analysis.
during evacuation occurred in 33.1% of constipated boys and 41.9% of constipated girls, who attended elementary school in Botucatu, state of São Paulo; those rates were lower than the ones found in this study. Occasional bleeding during evacuation occurred in 12.6% of the males and 19.6% of the females, which was also lower than that found by this study. However, the frequency of soiling (30.5% male and 31.8% female) was higher than the 14.3% found here. These differences are perhaps explained by the different age groups of the children studied, as those of more tender years exhibit alterations in the elimination of stools without soiling, which becomes established from 4 years of age onwards, as found in the children studied by the authors where the median of age was 8 years and 4 months. The prevalence of soiling was 2.6% in a community-based study carried out at the Integrated Centers for Public Education in Ilha do Governador, state of Rio de Janeiro, with 391 children, from 8 to 10 years of age, a result which is similar to the 5% (considering the whole population) detected here.

The high frequency of the onset of intestinal constipation before one year of age is consistent with the 67.8% of the initial symptoms of constipation occurring in the first year of life, found by some authors, but disagrees with the majority of studies that report higher frequencies of onset of constipation after one year of age, reaching a maximum between 2 and 3 years. It is important to underscore that the registry of cases of constipation used here is subject to errors, since it was not a prospective study, and further studies are necessary for its validation.

According to the results found, the approach using a group of alterations related to the elimination of stools to determine criteria for the diagnosis of chronic functional intestinal constipation has proved appropriate to the assessment of its prevalence in the study sample.

References