

ORIGINAL ARTICLE

HIGHLIGHTS

- Constipation treatment often results in resolution or improvement of enuresis, but occult constipation (OC) has not been investigated in children with enuresis.
- Fecal loading in the X-ray quantified by the Barr score detected OC in 37.0% of 81 enuretic children refractory to behavioral therapy denying constipation after simple questions; a detailed questionnaire based on the Boston diagnostic criteria detected overt constipation (called semi-occult constipation) in 61.7% of them.
- These results indicate that constipation should be carefully searched for in children with enuresis.

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# Occult and semi-occult constipation in children with monosymptomatic or non monosymptomatic enuresis

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**ABSTRACT – Background** – Functional constipation and enuresis frequently co-exist. Constipation treatment often results in resolution or improvement of the enuresis. However, besides the classical presentation, patients can present with occult constipation (OC) diagnosed in complementary evaluation; in addition, semi-occult constipation (SOC) can be detected by means of a detailed questionnaire. **Objective** – To quantify OC and SOC frequency in children with monosymptomatic or non monosymptomatic enuresis (MNE or NMNE). **Methods** – Otherwise healthy children/adolescents, with enuresis refractory to behavioral therapy and denying constipation after simple questions, answered a structured bowel habit questionnaire and were submitted to a plain abdominal radiological exam. Constipation was classified considering the Boston diagnostic criteria (to allow diagnosis at initial stages), and fecal loading in the X-ray quantified  $\geq 10$  by the Barr score. Children with constipation received a standardized treatment (except 26 “pilot” children). **Results** – Out of 81 children, 80 aged  $9.34 \pm 2.07$  years, 52.5% male, were diagnosed with constipation: 30 OC, 50 SOC; 63.75% had MNE, 36.25% NMNE (six NMNE without behavioral therapy). Demographic data and the Barr score were similar for OC and SOC, but SOC children experienced significantly more constipation complications (retentive fecal incontinence and/or recurrent abdominal pain). Not showing the Bristol Stool Scale (BSS) to 24 “pilot” children, or absence of constipation symptoms accompanying BSS predominantly type 3, in 13 children, did not significantly impact the detection of constipation by the Barr score. Children identifying BSS 3 or  $\leq 2$  had similar results. Twenty-eight children, with adequate follow-up after treatment, improved or recovered from constipation at 44 of their 52 follow-up visits. **Conclusion** – In patients with MNE or NMNE refractory to behavioral therapy, and who initially denied constipation after simple questions, a detailed questionnaire based on the Boston diagnostic criteria detected SOC in 61.7%, and the radiological Barr score revealed fecal loading (OC) in 37.0% of them.

**Keywords** – Children; adolescents; constipation; occult constipation; Barr score; enuresis.

## INTRODUCTION

Functional constipation and enuresis [either monosymptomatic (MNE: nocturnal enuresis), or non monosymptomatic (NMNE: nocturnal enuresis and daytime incontinence)<sup>(1)</sup>] often coexist, as known for decades<sup>(2-11)</sup>. Enuresis and retentive fecal incontinence, a constipation complication, being socially undesirable, decrease quality of life<sup>(6,12,13)</sup>. Since treatment of functional constipation often results in resolution or improvement of the enuresis<sup>(2-4,14,15)</sup>, constipation should be screened and treated in children with these voiding dysfunctions. Recent studies, however, question the relation between functional constipation and MNE, since constipation was not a risk factor for MNE<sup>(11)</sup>, and children were not free of nocturnal enuresis after fecal disimpaction<sup>(16)</sup>. Nevertheless, constipation treatment is recommended, when present, in both NMNE (as initial treatment) and MNE (when resistant to initial therapy)<sup>(17)</sup>.

Children with enuresis referred to our Urology section complete a standard questionnaire upon presentation. Those found to have constipation in addition to enuresis (27.4% in 2011) are referred to the gastrointestinal outpatient unit for further evaluation and treatment of that complaint. However, children denying constipation at initial evaluation can present with occult constipation (OC). This condition, first described for children with recurrent abdominal pain, is characterized by the absence of complaints and/or signs of constipation on initial medical history, but findings of hard stool on digital rectal examination and/or colonic fecal loading observed in an abdominal radiograph<sup>(18)</sup>. Also enuresis, non-structural urinary tract infection, and/or retentive fecal incontinence can be the only complaints/signs with which children with OC present<sup>(14,19)</sup>.

The discriminative value of the abdominal X-ray to diagnose constipation has been disputed<sup>(20,21)</sup>. Nevertheless, it is a cost-effective and easily available tool to identify OC. Different scores to quantify fecal loading on the X-ray are available. It was shown that the Barr score<sup>(22)</sup> should be preferred in the evaluation of children, since there was good agreement among three independent observers when comparing the Barr, Leech and Blethyn scores of children

clinically diagnosed with chronic functional constipation; significant decreases after fecal disimpaction occurred only for Barr and Leech, but the decrease was greater for the Barr score<sup>(23)</sup>. The exam being interpreted by a single experienced physician also adds to the preference for the Barr score<sup>(20)</sup>.

Clinical experience indicates that applying a detailed questionnaire about bowel habits before investigating a possible OC may detect overt constipation. We term this semi-occult constipation (SOC), since -like OC- this previously unrecognized constipation is recognizable when properly approached<sup>(2,14,24)</sup>.

Thus, we aimed to quantify the frequency of OC and of SOC in children with MNE or NMNE refractory to behavioral therapy and who initially deny constipation, using the Boston diagnostic criteria<sup>(19)</sup> (which allow diagnosis at initial stages<sup>(25)</sup>) and the Barr score<sup>(22)</sup>, considering that many, mainly those with NMNE, can potentially benefit from treatment of a detected constipation<sup>(2-4,14,15,17)</sup>.

## METHODS

This prospective longitudinal study followed the Brazilian Health Ministry ethical recommendations; it was approved by *Plataforma* Brazil and by the ethical board of the hospital (registration number 1484935). The pilot study ran along 2012; the main study along 2013-2016.

Inclusion criteria: otherwise healthy children/adolescents, aged 5-18 years, consecutively seen with MNE or NMNE as the main complaint, were advised behavioral therapy for 3 months. Those refractory to it (73.3%<sup>(26)</sup>) and who denied constipation after simple questions as per the Urology questionnaire ('do you have constipation or a trapped bowel?, fecal soiling?'), were included in the study. Exclusion criteria: overt or organic constipation, primary referral for urinary tract infection, encephalopathy, other disorders/diseases (identified or under suspicion), except symptoms that could represent constipation complications. Children with NMNE without behavioral therapy were not excluded, since it is considered nonessential for them.

Children meeting the inclusion/exclusion criteria followed the usual therapeutic approach for voiding

dysfunction<sup>(27)</sup> and were referred for gastrointestinal outpatient evaluation that included:

- Parents/caregivers informed consent after detailed information about the study protocol.
- A structured bowel habit questionnaire based on the Boston criteria<sup>(19)</sup>, applied to the children. Parents/caregivers intervened when necessary. These criteria<sup>(19)</sup> define constipation by the occurrence of any of the following, independent of stool frequency: passage of hard, scybalous, pebble-like or cylindrical cracked stools; straining or painful defecation; passage of large stools that may clog the toilet; or stool frequency less than 3 per week, unless the child is breastfed. Sometimes chronic constipation (symptoms for  $\geq 2$  weeks) presents itself as its complications: recurrent abdominal pain, enuresis, non-structural urinary tract infections, or fecal soiling (named retentive fecal incontinence nowadays).

Questions about fecal blood, diarrhea, vomiting, and abdominal distension were included.

To help identify their stool form/consistency, children were shown the Bristol Stool Scale (BSS)<sup>(28)</sup>, and/or the corresponding aspects were explained [grapes, lumpy, cracked or smooth bananas, soft blobs, mushy, watery (BSS types 1–7 respectively)]. Children identified their predominant type among the seven but were not informed which types are considered normal. BSS 1 (scybalous), 2 (pebble-like) and BSS 3 (cylindrical cracked stools) were considered constipation signs<sup>(19)</sup>.

Whenever recurrent abdominal pain (RAP) was present, additional questions about its possible causes -besides constipation- were asked. After inquiring about anal control acquisition, we asked about soiling the underwear and added “don’t be ashamed, it can be explained, and we can treat it”.

Questions about frequency and duration of both complications [RAP and retentive fecal incontinence (RFI)] and about toilet obstruction frequency were included.

- A complete physical exam. A digital rectal examination was avoided, since most children seen in the hospital for enuresis are pre-adolescents/adolescents, and stool retention would be observed in the radiograph.
- An abdominal radiograph (during the first visit

or some days before), obtained by a standard technique after spontaneous bladder emptying. The Barr score<sup>(22)</sup> was always applied by the same two physicians (HVLM, EV) and the lowest value was considered whenever some difference in punctuation occurred. We carefully observed whether a redundant sigmoid “invaded” the lower right quadrant, in order to not wrongly include it in that localization. Barr score  $\geq 10$  represents stool retention<sup>(22)</sup>. Scores 10–11, 12–15 and  $\geq 16$  were registered separately.

Considering the questionnaire answers and the Barr score<sup>(22)</sup>, children were classified:

### Semi-occult constipation (SOC)

- One or more constipation symptoms/signs based on the Boston criteria<sup>(19)</sup> and the Bristol Stool Scale (BSS)<sup>(28)</sup>:

$< 3$  defecations/week, pain and/or straining/give up at more than approximately 25% of defecations, BSS predominantly type 1–3 (or equivalent aspect), episode(s) of large diameter stools obstructing the toilet, during the previous month at least;

- Retentive fecal incontinence (RFI) and/or recurrent abdominal pain (RAP) episode(s) can also be present, during the previous 2 months at least [but not as isolated symptom(s)], unless clearly due to other disorders.
- Barr score  $\geq 10$ . Since an abdominal radiograph is not necessary to diagnose constipation when at least one clinical sign/symptom is present<sup>(19)</sup>, children were not dismissed from the study should the score be unavailable.

Summarizing:  $\geq 1$  constipation symptoms/signs [based on the Boston criteria<sup>(19)</sup> and the BSS<sup>(28)</sup> (or equivalent aspect)], accompanied or not by RFI and/or RAP, and Barr score  $\geq 10$  (but children not dismissed when unavailable).

### Occult constipation (OC)

- None of the constipation symptoms/signs cited for SOC;
- RFI and/or RAP can be present as isolated symptoms<sup>(18,19)</sup>, unless due to other disorders;
- Barr score  $\geq 10$ , the score being essential for diagnosis, since a digital rectal exam was avoided.

### No constipation

- None of the constipation symptoms/signs cited for SOC;
- No RFI and no fecal blood in the previous 2 months. RAP being present, another cause - besides constipation - should have been detected to explain it;
- Barr score <10, the score being necessary to exclude OC.

Additionally, a dietary questionnaire retrospective to 1 month was applied. The standardized constipation treatment consisted of one bowel washout with 250 mL saline solution (after careful explanation and agreement), when possible *in loco*, followed by an individually tailored and decreasing laxative schedule along 1–2 months with Mg(OH)<sub>2</sub> and/or PEG 4000, and a detailed dietary orientation<sup>(25,29)</sup>. Three follow-up visits between 4 and 31 weeks were scheduled, with an accepted upper limit of 39 weeks for inclusion in results. At home, children/caregivers registered, on printed sheets, each defecation characteristics and the constipation complications (RFI and RAP), since their last visit. Constipation was evaluated as: worse; unaltered; improved (seemingly recovered, but laxatives still in use, or at least 1 point less or half the frequency of RFI and/or RAP) or recovered [all symptoms/complications disappeared (irrespective of enuresis), no laxatives].

Data analysis: SAS software, version 9.4, and program R version 3.3 were used. Quantitative data were expressed according to the Tests for Normality (Shapiro-Wilk and Kolmogorov-Smirnov). We used the Student test for continuous variables with normal distribution, and the chi square, Fisher exact test, or a Test of Proportions (for small number of observations) for associations between groups and for explanatory data. Significance was accepted at the 5% level.

## RESULTS

Eighty-one children were included in the study: 30 OC (37.0%), 50 SOC (61.7%), 1 no constipation. The non-constipated 11.6 years-old boy presented with MNE and recurrent abdominal pain 2/week for 5 years, no other symptoms, 2–3 defecations/day,

BSS 4, Barr score 9. His final diagnosis was ontogenetic lactase deficiency. Of the 80 constipated children, 63.75% had MNE, 36.25% NMNE, 6 of the latter without behavioral therapy.

During the pilot period (n=26/81) the BSS was only shown to 2 OC children; to 20 OC and 4 SOC the corresponding BSS aspects were explained (TABLES 1 and 2). TABLE 1 depicts the bowel habit characteristics of OC and SOC children. All children without constipation symptoms/signs, 20% of them with retentive fecal incontinence (RFI) and/or recurrent abdominal pain (RAP), had their diagnosis of OC established by means of the radiological Barr score. All children with ≥1 constipation symptoms/signs, in various combinations, 60% also with RFI and/or RAP, were classified SOC, and the Barr score was ≥10 in 48 with an available score. Demographic data and the Barr score were similar for OC and SOC children, but the proportion of those with RFI and/or RAP was significantly higher in the SOC group.

Most analyzed variables were significantly more frequent in children with BSS data than in those without, but the Barr score was similar. OC predominated among children without BSS [20/24 (83.3%)], and SOC among those with BSS [46/56 (82.1%)] (TABLE 2). BSS type 3, considered normal<sup>(28)</sup> or a sign of constipation<sup>(19)</sup>, was identified by 29 SOC children (TABLES 1; 2): 16 of them with constipation symptoms/signs, and 13 without, had similar Barr scores. Also no significant differences were observed between SOC children identifying BSS 3 or BSS ≤2 (TABLE 2).

Frequency and duration data about constipation complications (RFI and RAP) were not available for all children presenting these symptoms, but a long duration was evident for most with the information (TABLE 3). Also, only nine of the 18 children with toilet obstruction reported its frequency: eight of them obstructed once or twice per month, one each 2 months.

Constipation treatment and outcome: the 26 “pilot” children received a somewhat different treatment from that standardized for the study period and were excluded from the outcome results. During the study period, 40 children were prescribed one bowel washout and 8 with intense symptoms/signs had two washouts prescribed. Two children who refused it and 4 adolescent boys without washout prescription

**TABLE 1.** Demographic data, bowel habit characteristics, constipation associated complications (RFI and/or RAP, recurrent UTI), and the radiological Barr score of children characterized as occult constipation (OC) or semi-occult constipation (SOC). Data are shown as n (%) of children, unless otherwise stated.

	Occult constipation n=30	Semi-occult constipation n=50	P-value
Mean age (± SD)	9.28 years (± 2.2)	9.37 years (±2.0)	0.8447
Male	15 (50.0)	27 (54.0)	0.9080
≥ 1/day: 3-6/week: <b>&lt;3/week</b> defecation frequency	26 (86.7): 4 (13.3): 0 (0.0)	33 (66.0): 12 (24.0): <b>5 (10.0)</b>	*
Bristol Stool Scale (BSS) predominantly ≤ 2: 3: ≥4 <sup>a</sup>	Bristol Stool Scale (n=10) 0 (0.0): 0 (0.0): 10 (100.0)	Bristol Stool Scale (n=46) <b>12 (26.1): 29 (63.0): 5 (10.9)</b>	*
Defecation pain/strain/give-up >25%	0 (0.0)	<b>16 (32.0)</b>	*
Toilet obstruction	0 (0.0)	<b>18 (36.0)</b>	*
Children with RFI, RAP or both	6 (20.0)	30 (60.0)	0.0012**
Retentive fecal incontinence (RFI)	3 (10.0)	13 (26.0)	0.2231
Recurrent abdominal pain (RAP)	2 ( 6.7)	7 (14.0)	0.6035
RFI and RAP	1 ( 3.3)	10 (20.0)	0.1113
Recurrent urinary tract infection (UTI)	1	1	-
Points: median (range) <sup>b</sup>	0.0 (0.0-2.0)	2.0 (0.0-5.0) <sup>c</sup>	*
Total Barr score: 10-11: 12-15: 16-18 <sup>d</sup>	6 (20.0): 21 (70.0): 3 (10.0)	8 (16.7): 33 (68.7): 7 (14.6) <sup>e</sup>	0.8102 <sup>f</sup>

**Bold** items indicate constipation variables by the Boston criteria<sup>(19)</sup>.

\*No statistical analysis: differences between OC and SOC children are due to the inclusion criteria. \*\*Significantly more constipation complications in children with SOC. <sup>a</sup>The highest indicated BSS was 5, by 1 child with OC. <sup>b</sup>One point for RFI, for RAP and for each constipation symptom/sign. No points for BSS 3 and for recurrent UTI. <sup>c</sup>Only 11 children with more than 2 points. <sup>d</sup>The highest obtained Barr score was 18. <sup>e</sup>Two children with SOC had no total Barr scores, due to excessive retained gas. <sup>f</sup>Also no significant differences when the Barr score was compared between OC and SOC children with or without BSS.

**TABLE 2.** Bowel habit characteristics, constipation associated complications [retentive fecal incontinence (RFI), recurrent abdominal pain (RAP)], and the radiological Barr score in additional analyses of children with occult constipation (OC) or semi-occult constipation (SOC), according to the Bristol Stool Scale (BSS). Data are shown as n (%), unless otherwise stated.

	<3 stools /week	Pain/give-up/ strain ≥25%	Toilet obstruction	RFI and / or RAP	Points mean (SD)	Total Barr score 10–11: 12–15: 16–18
56 with BSS <sup>a</sup>	4 (7.14)	15 (26.8)	16 (28.6)	34 (60.7)	1.64 (1.31)	9 (16.4): 38 (69.1): 8 (14.5) <sup>d</sup>
24 without BSS <sup>b</sup>	1 (4.17)	1 (4.17)	2 (8.3)	2 (8.3)	0.25 (0.61)	5 (21.7): 16 (69.6): 2 (8.7) <sup>d</sup>
P-value	0.8807	0.0205 <sup>c</sup>	0.0470 <sup>c</sup>	<0.0001 <sup>c</sup>	<0.0001 <sup>c</sup>	0.71
16 SOC BSS 3 plus <sup>e</sup>	2 (12.5)	10 (62.5)	11 (68.75)	14 (87.5)	2.63 (1.09)	3 (18.8): 9 (56.2): 4 (25.0)
13 SOC BSS 3 no <sup>f</sup>	0 (0.0)	0 (0.0)	0 (0.0)	8 (61.5)	0.77 (0.73)	3 (23.1): 8 (61.5): 2 (15.4)
P-value	--	--	--	0.2346	--	0.81
12 SOC BSS ≤2	0 (0.0)	3 (25.0)	3 (25.0)	5 (41.7)	2.17 (1.59)	2 (18.2): 8 (72.7): 1 (9.1) <sup>c</sup>
29 SOC BSS =3 <sup>g</sup>	2 (6.9)	10 (34.5)	11 (37.9)	22 (75.9)	1.79 (1.32)	6 (20.7): 17 (58.6): 6 (20.7)
P-value	0.6473	0.5527	0.4269	0.110	0.4416	0.64

<sup>a</sup>10 OC, 46 SOC children. <sup>b</sup>20 OC, 4 SOC children. The 24 children without BSS and 2 OC children with BSS were evaluated during the pilot period.

<sup>c</sup>Significantly higher frequencies in children to whom the BSS was shown. <sup>d</sup>One SOC child without total Barr score, due to retained gas. <sup>e</sup>16 plus functional constipation symptoms, <sup>f</sup>13 no functional constipation symptoms. <sup>g</sup>In addition 5 children identified BSS 4, summing up 46 SOC children with BSS.

**TABLE 3.** Frequency and duration of constipation complications in children with detected occult constipation (OC) plus semi-occult constipation (SOC).

	Retentive fecal incontinence (RFI) 27/80 OC+SOC	Recurrent abdominal pain (RAP) 20/80 OC+SOC
Available frequency [n (%)]	14/27 (51.8%)	15/20 (75%)
Median (range)	3/w (2/d–2/mo) <sup>a</sup>	1/w (1/d–1/mo)
Available duration [n (%)]	14/27 (51.8%) <sup>b</sup>	14/20 (70%)
Median (range)	15mo (15d–7.7y)	1y (15d–4y)
Duration ≥6 mo	11/14 (78.6%)	10/14 (71.4%)

<sup>a</sup> Only one child with less than one RFI episode per week. <sup>b</sup> Three children with primary RFI, aged 8.25y–11.7y, not included.

received an increased laxative schedule. The washout output was observed in 14/23 children submitted to it at the initial visit: one obstructed the toilet and blood streaks were visible, ten eliminated stools BSS types 1 and/or 2, and three eliminated liquid/soft stools; other seven reported great amount of hard stools elimination. Twenty-five children made the washout elsewhere.

Four OC and 24 SOC children presented themselves at 52 follow-up visits (7 OC, 45 SOC visits) with reliable information and within the accepted limit for the visits. Compared to the previous visit, constipation improved or recovery had occurred at 44 visits (84.6%). Reporting OC children separately, two improved and two had recovered at their last visits.

### DISCUSSION

The predominance of MNE over NMNE in the present study was similar to that in Spanish school children<sup>(11)</sup>. Since we studied children with enuresis, which often coexists with constipation<sup>(1-11,15)</sup>, and mainly those refractory to behavioral treatment, this was a highly selected population; thus, we expected a higher frequency of OC than that detected in the general pediatric population attending an university hospital, estimated at 8%<sup>(14)</sup>. In fact, in the present study, 37% had OC and, in addition, 61.7% SOC was detected. This high SOC (in fact overt constipation) detection was not unexpected, since in O'Regan's pioneering study it was detected in 88%, although in a small series of 25 enuretic children<sup>(2)</sup>. More recently, 82.4% overt constipation and 14.3% OC were detected by means of the Rome criteria in children with extraordinary daytime urinary frequency, another lower urinary tract disorder<sup>(1,30)</sup>. These data are

similar to our 72.2% overt constipation and 26.9% OC, when also considering the children with constipation detected in the Urology section.

Children with SOC possibly failed detection because details about bowel habits are often overlooked in busy health center/hospital routines. Alternatively, diagnoses may be missed when family members and the child share a similar bowel habit. Other possible reasons are the popular belief that constipation is more related to bowel frequency than to stool and defecation characteristics, or the presence of only mild constipation. In fact, the majority of our SOC children presented with mild symptoms: ≥3 stools/week (90%), BSS ≥3 (73.9%), and only 11 summed up more than two points, among constipation symptoms and its complications.

Detection of mild constipation allowing early intervention is desirable and might be possible using the Boston criteria<sup>(19)</sup>, instead of the pediatric Rome Diagnostic Criteria<sup>(31)</sup>, as previously discussed<sup>(25)</sup>: in short, the Boston criteria allow an earlier diagnosis and before complications ensue, since only one item is necessary for diagnosis, instead of two, and retentive fecal incontinence (a late event, because a constipation complication) is not considered an inclusion criterion<sup>(25)</sup>. Further corroboration for using the Boston criteria is that more mild constipation was detected in children with lower urinary tract symptoms, when an adapted constipation scoring system instead of the Rome IV criteria was used<sup>(10)</sup>. Avoidance of a digital rectal exam in our children, as it was avoided in a community study with the general pediatric population<sup>(24)</sup>, was another reason not to use the Rome criteria<sup>(31)</sup>. Had we used the Rome criteria, SOC children not diagnosed overt constipation by these criteria would be OC in the present study, taking

into account the Barr score results. Thus, considering OC *plus* SOC, our final results would not be different by the Rome criteria. But, in clinical practice, to investigate OC, an abdominal radiograph is advisable, whereas it is dispensable when overt constipation is diagnosed<sup>(19,31)</sup>, and this is an important aspect to consider. Remarkably, even 6 SOC children summing up 4–5 points (among constipation symptoms/signs and its complications often lasting more than 6 months up to years) remained undetected.

Although previously unrecognized, constipation was present in at least 74/81 children (91.4%) with Barr  $\geq 12$ . Six OC children with the lowest Barr scores (10–11) and no follow-up visits were not computed in these numbers to avoid over-diagnosis; one has to consider, however, that also eight children with SOC had Barr 10–11. Valuable clinical adjuncts, like details about toileting, observation or report of the bowel washout aspect (see results) and treatment outcome, help us to support such results. Toileting of children older than 5.4 years (our youngest child) is usually quite independent of parents/caretakers. Thus, in around 50% of the children with toilet obstruction and/or retentive fecal incontinence, data about these issues were either absent or unreliable, perhaps due to shame in discussing such aspects; but, when available, the data point to its intensity and contribute to the diagnosis of constipation. Importantly, constipation treatment outcome for the 28 children with 52 follow-up visits, during the study period, showed decrease or absence of constipation symptoms and of complications at 44 visits. Although constipation treatment may be less useful for MNE recovery<sup>(11,16)</sup>, all children must undergo treatment once constipation is detected, to avoid, at least, its worsening.

In previous studies, neither children nor parents were in agreement between stool form/consistency report and the indicated BSS types, but the authors excluded answers with variable BSS types<sup>(32,33)</sup>, the most common occurrence<sup>(34)</sup>. We asked for the predominant aspect, and explained the corresponding aspects of shape/consistency to patients/caregivers, which added credibility to the answers<sup>(35)</sup>. BSS type 3 merits a detailed discussion since it was the most frequently identified fecal aspect in our SOC children [29/46 (63%)], as it was in the community<sup>(24)</sup>. Thus, one should be alert about constipation, when BSS type 3

is the predominant aspect, even if it is the only possible constipation sign<sup>(19)</sup> (as it occurred in 13 children), since children with BSS 3 and BSS  $\leq 2$  (an unequivocal sign of constipation) had similar clinical and radiological data. Furthermore, the frequency of complications and the Barr score of the 13 children were similar to that of the 16 identifying BSS 3 who in addition presented with constipation symptoms/signs.

Not showing the BSS to 24 children did not impact the detection of constipation (OC+SOC) by the Barr score; only the proportion of children with OC or SOC was affected. Thus, the significant differences observed between children with or without BSS, for most variables, reflect the differences between OC and SOC children. SOC predominating among children with BSS indicates that showing the BSS could improve the detection of SOC, and also of RFI and RAP. Other authors also reported that significantly more children identified hard stools on the BSS compared to their questionnaire answers, although the difference in constipation prevalence was small<sup>(33)</sup>.

The Barr score was  $\geq 10$  for all SOC children with an available score, confirming that it was able to detect stool retention in children with constipation when applied by physicians used to it<sup>(20)</sup>. Furthermore, it allowed comparison with OC. This tool was also valuable in helping treatment acceptance, by objectively showing fecal loading to patients and caregivers not previously conscious of the constipation.

Although constipation resolution is part of enuresis treatment, the presence of previously undetected constipation has not, to our knowledge, been investigated before in these children, this being the strength of the current study. Clinical studies are bound by difficulties, and thus a limitation of the study was lack of follow-up for 26/54 (48.1%) children (a proportion similar to that of children not appearing for follow-up at other clinics of the hospital). Although this was not the study's objective, it would add data that could reinforce constipation frequency results even more. Also, the cross-over impact of constipation treatment on enuresis outcome could not be addressed, as originally planned (one group treated enuresis first, the other constipation first), due to reference and counter-reference problems.

## CONCLUSION

In patients with MNE or NMNE refractory to behavioral therapy, and who initially deny constipation after simple questions, constipation should be carefully searched for, since in our study population a detailed questionnaire based on the Boston diagnostic criteria detected SOC in 61.7%, and the radiological Barr score revealed fecal loading (OC) in 37.0% of them.

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### Authors' contribution

Maffei HVL conceived and designed the study

protocol, executed the main survey, compiled the data, drafted the manuscript and wrote the final version. Vidolin E contributed to the conception and design of the study protocol, executed the 'pilot' and the main survey. dos Reis JN treated the children in the rehabilitation section of the Urology Unit, sent the study protocol to the Research Ethics Committee, collected the enuresis data. de Freitas M submitted the patients to behavioral therapy and selected them for inclusion during the study period. Cabral BH submitted patients to behavioral therapy and selected them for inclusion during the 'pilot' period. Trigo-Rocha F, Urology's Unit head, gave shelter to the study of enuresis patients, made valuable contributions to the final manuscript. All authors participated in the discussions for the final study design and approved the final manuscript.

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Maffei HVL, Vidolin E, Reis JN, Freitas M, Cabral BH, Trigo-Rocha F. Constipação oculta e semi-oculta em crianças com enurese monossintomática ou não monossintomática. *Arq gastroenterol.* 2023;60(4):410-8.

**RESUMO – Contexto** – Constipação funcional e enurese frequentemente coexistem. Tratamento da constipação geralmente resulta em cura ou melhora da enurese. Entretanto, além da apresentação clássica, pode ocorrer constipação oculta (CO), diagnosticada por exame subsidiário; ademais, ao aplicar questionário detalhado, pode-se detectar constipação semioculta (CSO). **Objetivo** – Obter as frequências de CO e CSO em crianças com enurese mono- ou não monossintomática (EMN ou ENMN). **Métodos** – Crianças/adolescentes saudáveis, exceto por enurese refratária à terapia comportamental, e que negavam constipação após perguntas simples, respondiam a questionário estruturado sobre hábito intestinal, e realizavam radiografia simples de abdômen. A constipação foi classificada considerando os critérios diagnósticos de Boston (que permitem diagnóstico em fases iniciais) e retenção fecal na radiografia quantificada  $\geq 10$  pelo escore de Barr. As crianças com constipação receberam tratamento padronizado (exceto 26 crianças "piloto"). **Resultados** – Das 81 crianças, 80 com idade  $9,34 \pm 2,07$  anos, 52,5% masculinas, foram diagnosticadas com constipação: 30 CO, 50 CSO; 63,75% tinham EMN, 36,25% ENMN (6 ENMN sem terapia comportamental). Os dados demográficos e o escore de Barr foram semelhantes para CO e CSO, mas as crianças com CSO apresentaram significativamente mais complicações de constipação (incontinência fecal retentiva e/ou dor abdominal recorrente). A não apresentação da Escala Fecal de Bristol (EFB) para 24 crianças "piloto", ou ausência de sintomas de constipação acompanhando EFB predominantemente do tipo 3, em 13 crianças, não teve impacto significativo na detecção de constipação pelo escore de Barr. Crianças que identificaram EFB 3 ou  $\leq 2$  tiveram resultados semelhantes. Vinte e oito crianças, com acompanhamento adequado após o tratamento, melhoraram ou se recuperaram da constipação em 44 de seus 52 retornos. **Conclusão** – Em pacientes com EMN ou ENMN refratária à terapia comportamental, e que inicialmente negavam constipação após perguntas simples, questionário baseado nos critérios diagnósticos de Boston detectou CSO em 61,7%, e o escore radiológico de Barr revelou retenção fecal (CO) em 37% deles.

**Palavras-chave** – Crianças; adolescentes; constipação; constipação oculta; Escore de Barr; enurese.



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