

Functional Fecal Retention With Encopresis in Childhood

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ABSTRACT

Objectives: The most common cause of encopresis in children is functional fecal retention (FFR). An international working team suggested that FFR be defined by the following criteria: a history of >12 weeks of passage of <2 large-diameter bowel movements (BMs) per week, retentive posturing, and accompanying symptoms, such as fecal soiling. These criteria are usually referred to as the ROME II criteria. The aims of this study were to evaluate how well the ROME II criteria identify children with encopresis; to compare these patients to those identified as having FFR by historical symptoms or physical examination; to determine whether 1-year treatment outcome varied depending on which definition for FFR was used; and to suggest improvements to the ROME II criteria, if necessary.

Methods: Data were reviewed from the history and physical examination of 213 children with encopresis. One-year outcomes identified were failure, successful treatment, or full recovery.

Results: Only 88 (41%) of the patients with encopresis fit the ROME II criteria for FFR, whereas 181 (85%) had symptoms of FFR by history or physical examination. Thirty-two (15%) patients did not fit criteria for FFR, but only 6 (3%) appeared to have nonretentive fecal soiling. Rates of successful treatment (50%) and recovery (39%) were not significantly different in the two groups.

Conclusions: The ROME II criteria for FFR are too restrictive and do not identify many children with encopresis who have symptoms of FFR. The author suggests that the ROME II criteria for FFR could be improved by including the following additional items: a history of BMs that obstruct the toilet, a history of chronic abdominal pain relieved by enemas or laxatives, and the presence of an abdominal fecal mass or rectal fecal mass. *JPGN* 38:79–84, 2004. **Key Words:** Children—Constipation—Encopresis—Functional fecal retention. © 2003 Lippincott Williams & Wilkins, Inc.

The most common cause of functional encopresis (idiopathic fecal soiling) in children is functional fecal retention (FFR) (1). Children with encopresis have widely different symptoms, which suggests that there may be different underlying pathologies. Several investigators have attempted to develop objective tests by which to categorize children with constipation/encopresis, including measurements of intestinal transit (2–4), anorectal manometric parameters such as threshold for rectal sensation and critical volume inducing a strong urge to defecate (5,6), and defecation tests (6–9). Others have classified encopresis by other criteria, such as severity of encopresis, primary versus secondary encopresis, or by degree of constipation (6,10–14). Using the degree of constipation for classification, an international working team has suggested that children with encopresis should be classed as FFR or nonretentive fecal soiling on the basis of characteristic clusters of symptoms, the Rome II

criteria (15). FFR was defined as fecal retention not associated with anatomic abnormalities or intake of medication.

The aims of this study were to (1) evaluate how well the ROME II criteria for FFR identifies children with encopresis; (2) compare children with encopresis identified by ROME II criteria with those identified as having FFR by historical symptoms or physical examination; (3) determine whether treatment outcome in children with FFR varies depending on which definition for FFR is used; and (4) suggest improvements to the ROME II criteria, if necessary.

PATIENTS AND METHODS

Patients

The intake data of all consecutive children ≥ 5 years of age with functional encopresis initially treated by the author between April 1985 to March 1995 at the University of Iowa Hospital and Clinics were re-evaluated, applying the new ROME II criteria for functional fecal retention. Children with underlying disease, such as Hirschsprung's disease, chronic intestinal pseudo-obstruction, moderate to severe mental retardation, autism, and previous surgery of the colon or anus, were

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not included. Two hundred fifty-four children ≥ 5 years of age with functional encopresis ≥ 1 /week for >12 weeks' duration were identified. Twenty-one children who were already receiving long-term laxative treatment at the initial visit and in whom no clear history for frequency of bowel movements (BMs) and soiling before laxative treatment could be established were excluded. Also excluded were 20 children who were followed up for 6 months or less. There were 213 children with encopresis whose records were appropriate for the analysis. The study was approved by the Institutional Human Research Review Committee.

Methods

Patient information was collected on a standard intake form filled out at the time of the initial clinic visit. The intake form contained questions regarding the child's general health, the defecation interval, the amount, diameter, and consistency of bowel movements deposited into the toilet and evacuated into the underwear, the occurrence of stools big enough to obstruct the toilet, the presence of retentive posturing, abdominal pain, daytime wetting, and nighttime wetting. Parents reported the amount of soiling as complete evacuation of a bowel movement, small BM, or smear in the underwear. "Complete evacuation only" is used for children who evacuated only complete BMs into their underwear but never a smear or small BM. Details of the child's toilet training were obtained, ie, whether the child was completely trained for BMs for >1 month (secondary encopresis) or had never been toilet trained (primary encopresis). Duration of encopresis was calculated using 4 years of age as the time when a child should have been bowel trained. The typical household toilet plumbing in the United States is a 7.5-cm pipe.

The physical examination was thorough and included an abdominal examination looking for the presence or absence of a fecal abdominal mass, a rectal examination evaluating the rectal content, and a neurologic examination.

Most children with encopresis had no laboratory evaluations. Plain abdominal films were obtained to assess the presence and amount of retained stool in two children who vehemently refused rectal examination, in a few markedly obese children, and in a few children who were already taking laxative treatments prescribed by other caregivers.

Definition of FFR

The diagnostic criteria for FFR listed in the ROME II criteria (15) for children from infancy to 16 years of age are: passage of large-diameter BMs at intervals of <2 times per week for at least 12 weeks; avoiding defecation by purposefully contracting the pelvic floor (retentive posturing); and associated symptoms including fecal soiling, irritability, abdominal cramps, decreased appetite, or early satiety, which disappear after passage of a large BM.

The diagnostic criteria used in the current study for defining FFR by historical symptoms or physical examination were a history of at least 12 weeks of encopresis with either an abdominal fecal mass palpable on physical examination (occasionally a previous abdominal x-ray was used to identify the abdominal fecal mass when a child had already begun a regimen of laxative before the initial clinic visit), a history of BMs

big enough to obstruct the toilet, or a history of chronic abdominal pain relieved by laxatives.

Treatment

All children were treated initially with milk of magnesia. Lactulose, sorbitol, or mineral oil were used if milk of magnesia was refused. Senna was given to children who experienced no response to osmotic laxatives. Milk of magnesia at 1 mL/kg body weight/day was suggested for children with only a rectal fecal mass at the initial evaluation. A dose of 2.5 mL/kg body weight/day was prescribed for children with a fecal mass palpable in the abdomen at the initial evaluation. The dose of milk of magnesia was slowly adjusted by the parents and the physician until the child was having one to two soft bowel movements per day without fecal soiling and abdominal pain. Throughout the treatment, digital examinations were performed with sufficient frequency to ensure that fecal impaction and chronic constipation had been relieved and that treatment was progressing satisfactorily.

Regular toileting for 5 minutes after each meal were required for the initial months. The patients and parents were provided with diaries in which to record BMs and their consistency, soiling episodes, abdominal pain episodes, urinary incontinence, and medication use.

Follow-up

Children were scheduled for monthly evaluations until therapy was considered adequate and thereafter every 3 months. At each visit, the interim history was assessed, stool diaries were collected and discussed, and a physical examination, including a rectal examination, was performed. After regular bowel habits were established for several months, the laxative dose was gradually decreased to a dose that maintained one bowel movement daily and prevented soiling. After another 3 months, the dose was further reduced, until discontinuation of laxative use was attempted. Treatment resumed if constipation or soiling recurred.

Outcome

Outcome was assessed 1 year after the initial visit. If the child did not come for the 1-year follow-up visit, information was elicited by a mailed questionnaire. If the questionnaire was not returned, the family was contacted by telephone. If no contact could be established, the last clinic visit (at least more than 6 months after the initial evaluation) was used as the source of final patient information.

The questionnaire asked about frequency and consistency of BMs, frequency and amount of soiling, laxative use, abdominal pain, and daytime and nighttime urinary incontinence during the last month. The letter accompanying the questionnaire indicated that the data were obtained for research purposes and the questionnaire was approved by the Institutional Human Research Review Committee.

Outcome was assessed by identifying which patients could be considered to have experienced successful treatment or full recovery. The constipation or fecal soiling was rated as successfully treated if the child had ≥ 3 BMs/week in the previous month, no soiling, no abdominal pain, and was not using a

laxative (16). Recovery was defined as ≥ 3 BMs/week and ≤ 2 smears/month while taking no laxatives for at least 1 month (5,10,17–21).

Statistical analysis

Statistical analysis included the *t* test and χ^2 test with significance accepted at the 5% level. Results were expressed as mean \pm SD or percent.

RESULTS

Only 88 (41%) of the 213 patients with encopresis fit the ROME II criteria for FFR (ie, having < 2 BMs/week and retentive posturing). One hundred eighty-one (85%) patients with encopresis had signs of FFR in the history or on physical examination. One hundred thirteen patients had an abdominal fecal mass at the initial visit, which was either palpable or occasionally documented on x-ray. An additional 53 patients gave a history of BMs that obstructed the toilet, and 12 others had chronic abdominal pain relieved by laxative treatment. Overall, 113 (53%) patients had documentation of an abdominal fecal mass, 151 (71%) gave a history of BMs obstructing the toilet, and 107 (50%) had chronic abdominal pain relieved by laxatives.

As shown in Table 1, patients with FFR by ROME II criteria had significantly fewer BMs/week ($P < 0.001$) and all had retentive posturing ($P < 0.001$) compared with patients who had FFR by symptoms or physical examination. Fewer than 2 BMs/week and retentive posturing were the two diagnostic criteria required for FFR by the ROME II criteria. Patients who fit the ROME II criteria more frequently had an abdominal mass ($P < 0.01$). Age, BMs that obstructed the toilet, abdominal pain, soiling frequency, primary encopresis, day and nighttime enuresis, and rectal impaction were similar in both groups.

Outcome

Outcome was assessed 1.3 ± 0.5 years after the initial visit (range, 0.8–2.6 years). As shown in Table 2, the rates for successful treatment were similar for the 88 patients who fit the ROME II criteria and the 181 who had FFR diagnosed by history or physical examination (51% versus 50%). The rates of recovery also were similar (39%) in both groups. As can be seen in Table 2, the different parameters for constipation/fecal soiling also were similar.

Factors predicting successful treatment

As in a previous publication (16), the current author defined successful treatment as having ≥ 3 bowel movements/week, no soiling during the last month, and no abdominal pain, independent of laxative use. Forty-four of the 88 (51%) patients with FFR diagnosed by ROME II criteria and 91 of the 181 (50%) with FFR diagnosed by symptoms or physical examination were successfully treated. Age, gender, symptoms from the history and physical examination such as retentive posturing, < 2 BMs/week, BMs that obstructed the toilet, daily BMs, abdominal pain, soiling, duration of encopresis, and presence of a rectal impaction or abdominal mass did not predict successful treatment at the 1-year follow-up (Table 3). The only predictor for successful treatment in the 181 patients was the presence of secondary encopresis ($P < 0.02$).

Factors predicting recovery

As in previous publications (5,10,17–21), the current author defined recovery as ≥ 3 BMs/week and ≤ 2 soiling episodes/month while not taking laxatives for 1 month. Thirty-four of the 88 (39%) patients with FFR by ROME II criteria and 71 of the 181 (39%) with FFR by symptoms or physical examination had recovered at 1 year.

TABLE 1. Initial data from the history and physical examination

	Functional fecal retention defined by:		<i>P</i>
	ROME II criteria (n = 88)	Symptoms and/or physical examination (n = 181)	
History			
Age (years)	9 \pm 3	9 \pm 3	NS
On laxatives	28%	29%	NS
BMs/week	1.5 \pm 1.7	3.2 \pm 4.1	0.001
Retentive posturing	100%	78%	0.001
BMs that obstructed the toilet	89%	84%	NS
Presence of abdominal pain	56%	59%	NS
Frequency of soiling episodes/week	16 \pm 19	15 \pm 18	NS
Primary encopresis	44%	46%	NS
Daytime urinary incontinence	24%	28%	NS
Nighttime urinary incontinence	31%	32%	NS
Physical characteristics:			
Presence of a large BM in the rectum	98%	92%	NS
Presence of an abdominal fecal mass	74%	62%	0.006

TABLE 2. 1-year outcome of children with functional fecal retention

	Functional fecal retention defined by:		P
	ROME II criteria (n = 88)	Symptoms and/or physical examination (n = 181)	
1-year follow-up:			
Successful treatment*	51%	50%	NS
Recovered†	39%	39%	NS
Frequency of BMs/week	5.5 ± 3.5	6.3 ± 4.0	NS
On laxatives	42%	40%	NS
Children with <2 BMs/week	8%	5%	NS
Presence of abdominal pain	10%	13%	NS
Frequency of soiling episodes/week	1 ± 3	1 ± 2	NS
Children with soiling	38%	39%	NS
Daytime urinary incontinence	2%	6%	NS
Nighttime urinary incontinence	11%	16%	NS

* Successful treatment: ≥ 3 bowel movements (BMs)/week, no soiling, no abdominal pain, independent of laxative use.

† Recovered: ≥ 3 bowel movements/week and ≤ 2 smears/month, while off laxatives for 1 month.

Age, gender, symptoms from the history and physical examination, such as retentive posturing, < 2 BMs/week, BMs that obstructed the toilet, daily BMs, abdominal pain, soiling complete evacuations, soiling complete evacuations only, duration of encopresis, and presence of a rectal impaction or abdominal fecal mass did not predict recovery at the 1-year follow-up (Table 3). The predictors for recovery were the presence of secondary encopresis in both groups ($P < 0.03$) and shorter duration of encopresis in children with FFR by ROME II criteria (2.8 ± 2.2 years versus 4.1 ± 2.8 years; $P < 0.02$).

DISCUSSION

Only 41% of the current study's patients with encopresis were identified as having FFR by the ROME II

criteria, whereas 181 (85%) of them had FFR by important historical data and physical findings, such as an abdominal fecal mass, BMs that obstructed the toilet, and abdominal pain relieved by enemas or laxatives. These findings agree with the assessment by Nurko (22) that the ROME II criteria for FFR are too restrictive and exclude many patients who have underlying symptoms of FFR.

The 1-year outcome for patients with encopresis and FFR were independent of the criteria used to define FFR, either the ROME II criteria or by symptoms and/or physical examination. Approximately 50% of patients were successfully treated, and 39% experienced recovery. Secondary encopresis, defined as having been completely bowel trained for ≥ 1 month, was related to recovery independent of the criteria used for FFR. A better

TABLE 3. Outcome related to factors in the history or on initial physical evaluation

	P value			
	Successful treatment*		Recovery†	
	n = 88	n = 181	n = 88	n = 181
History				
Age	0.43	0.0509	0.898	0.491
Sex	0.277	0.672	0.116	0.738
Retentive posturing	1	1	1	0.165
<2 BMs/week	1	0.202	1	0.715
BMs that obstructed the toilet	0.559	0.551	0.599	0.288
Daily BM	1	0.821	1	0.536
Presence of abdominal pain	0.978	0.874	0.643	0.801
Soiling complete evacuations	0.554	0.506	0.182	0.725
Soiling complete evacuations only	0.670	0.514	0.638	0.164
Primary/secondary fecal soiling	0.16	0.011	0.03	0.005
Duration of encopresis	0.069	0.815	0.018	0.127
Physical examination				
Presence of a rectal impaction	0.972	0.981	0.255	0.769
Presence of an abdominal fecal mass	0.277	0.585	0.293	0.17

* Successful treatment: ≥ 3 bowel movements (BMs)/week, no soiling, no abdominal pain, independent of laxative use

† Recovered: ≥ 3 bowel movements/week and ≤ 2 smears/month, while off laxatives for one month.

recovery rate in children with secondary encopresis has been noted in previous publications (9,17). Children with FFR by ROME II criteria had a significantly shorter duration of encopretic symptoms than did children who had not experienced recovery. All other symptoms in the history or findings on physical examination did not predict 1-year outcome.

It is difficult to identify and characterize children with encopresis using the ROME II criteria, using <2 BMs/week and retentive posturing as the only requirements for the definition of FFR. Counting BMs is an inaccurate process. For example, should only BMs defecated into the toilet be counted, or should the tally also include BMs evacuated into the underwear? How should one account for small and large BMs? The main reason against using a defined number of BMs/week is that fecal retention is not a result of the number of BMs that are defecated but a result of the amount of stool retained. Because more than 98% of people have at least 3 BMs/week, a frequency of less than 3/week often is considered abnormal. Many patients are symptom free while having less frequent BMs, whereas others are uncomfortable, suffer pain, or experience fecal soiling at the same frequency. Thus, frequency of BMs can not be considered in isolation. The consistency and size of the BM and the accompanying abdominal pain are at least as important.

The presence of a rectal impaction is also a feature of FFR not included in the definition of FFR by the ROME II criteria. The author also did not use this feature in the definition used for the current study, but a rectal impaction without a palpable abdominal fecal mass may need to be considered in the definition of FFR. Including a rectal fecal impaction in the definition of FFR would have added another 16 (8%) patients to the group of patients with FFR as defined by history or physical examination. But how is a rectal impaction discovered if no rectal examination is done or the child is already taking a laxative? All of the patients reported in the current study had frequent rectal examinations. Failure to perform a rectal examination during the initial examination may lead the physician to make a diagnosis of functional nonretentive fecal soiling and raise concerns of emotional disturbance as the cause (15). In addition, failure to perform a rectal examination while monitoring a patient's therapy may lead to inadequate treatment for the child with encopresis.

Encopresis is the result of FFR in most children. Using the current author's definitions, 85% of children with encopresis had underlying FFR. Most children with encopresis benefit from the treatment approach used by the current author, which include laxatives. Nolan et al. (17) from Australia reported better 1-year outcome in children with constipation and encopresis who received behavioral treatment and laxatives (51%) than in those who received behavioral treatment alone (39%).

Most of the children reported here were treated with milk of magnesia, the current author's preferred laxative at the time this study was performed. Other investigators have avoided recommending any specific laxative. The author thinks the choice of medication is not critical and that the decision is made using a combination of physician and patient preference and cost. All laxatives have good results in clinical use if dose and compliance are adequate (23).

A subset of six (3%) children with encopresis in the current study had no history of fecal retention, no signs of fecal retention, and were not already receiving laxative at the initial visit, thus fitting the ROME II criteria for functional nonretentive fecal soiling (15). Treatment in all six children was deemed unsuccessful at 1 year after initiation of therapy.

In summary, at least 85% of children had FFR underlying their encopresis. The ROME II criteria for FFR were too restrictive and did not identify many children with encopresis with underlying FFR. At 1-year follow-up, successful treatment was accomplished in 50% and recovery in 39% of children with FFR. Children with secondary encopresis had higher rates of successful treatment and recovery. The author suggests revising the ROME II criteria for FFR by taking other features into consideration, such as a history of BMs that obstruct the toilet, chronic abdominal pain relieved by enemas or laxatives, abdominal fecal mass, and perhaps rectal impaction.

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