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exercer 2017;134:267-73.

Child care in general practice: Was an indication for digital rectal examination still relevant in 2016?

A literature review

INTRODUCTION

In France, children under the age of 16 can be treated by pediatricians as well as general practitioners (GP). The latter follow 40% of children by themselves, and 55% of them together with a pediatrician. All in all, follow-up consultations with children represent 13% of the consultations carried out by GPs¹.

In 2016, according to the French *Collèges des enseignants de pédiatrie et de gastro-entérologie* (pediatrics and gastro-enterology teachers' college), rectal examination (RE), which is inexpensive but relatively unspecific, could function as a diagnostic tool for different pathologies. It could help to evaluate peri-anal sensations, anal sphincter tone, external anal and cremasteric reflex, rectum size, stool quantity and consistency, congenital malformation of the anus and the spinal column and presence of rectal prolapse, melena or rectal hemorrhage; it could also permit examination of the rectal wall²⁻⁹. That said, RE training is not commonly included in initial medical education, either in France or the United States¹⁰.

Different studies have reported that RE is liable to generate conflict situations and

even violence toward health care staff, particularly with young men and at times with minors and intoxicated persons or substance users¹⁰⁻¹⁵. Carried out as a matter of routine and/or poorly explained, RE can generate psychological and emotional consequences, and even legal repercussions in the event of incomprehension by a patient or his parents¹⁶. Given its low degree of specificity and due to the discomfort it entails, any relevant information pertaining to RE should imperatively be presented to patients, especially when they are children.

As regards legislation on medical care for minors, parents have the right to be present at the examination, which they may also have a chance to facilitate. If, on the other hand, a child (a teenager, in particular) does not wish to be interrogated or examined in the company of his parents, the presence of a third party, usually a staff member, is recommended. The reasons for RE, administration of the procedure, and its expected results must be explained to the child and the parents, their common agreement being mandatory before the examination can be carried out¹⁷.

So it is that the question of the appropriateness of RE is

raised when a child is undergoing treatment, and its ethical dimension is evident.

The objective of this review of the literature was to establish a situational analysis of present-day justifications for RE during treatment of a child by a general practitioner.

METHOD

A review of the literature was carried out through consultation of the databases *Medline*, *Cochrane Library*, *Science Direct*, *Google Scholar*, the review *Prescrire*, *La Revue du Praticien*, and those of the French health authority (HAS) and the *Collèges des enseignants de pédiatrie de gastro-entérologie français* (see above). They were explored from the time of their creation through the month of January 2016.

All articles in French or English dealing with RE for children were collated and classified according to the symptoms described: abdominal pains, constipation, suspected appendicitis.

The MeSH terms utilized were the following: *digital rectal examination*, *child*, *constipation*, *appendicitis*, *abdominal pain*, *diagnosis*, *fecal impaction*. Initial research associating

the two keywords *digital rectal examination* and *child* with each of the symptoms under consideration took place (Table 1). Initial bibliographic research was carried out on the *Medline* database, after which the keywords were adapted to the data bases explored.

The different steps of the bibliographic research are represented in the Figure.

The articles were evaluated in accordance with the criteria mandated by the French health authority (HAS). Meta-analyses of randomized comparative trials, high-power randomized comparative trials and public health recommendations based on well-conducted studies were classified as having a high level of evidence. Studies appearing sound with regard to some of their characteristics but without reaching a high level of evidence were classified as having a medium level of evidence (low-power randomized comparative trials, well-conducted non-randomized comparative trials, cohort studies). Finally, monocentric or non-comparative studies and expert opinion were classified as having a low level of evidence.

RESULTS

The characteristics of the selected articles are detailed in Table 2.

Fifteen articles were chosen and analyzed; while two of them dealt with justification for RE in childhood and adolescent illnesses, 12 were devoted to treatment of children suffering from abdominal pain, including 8 in connection with constipation and 5 having to do with appendicitis.

Modalities and theoretical indications for RE in the child

Two articles and a reference table were analyzed.

Experts on French reference documents in pediatrics and gastro-enterology described the means of RE performance and testing of the anal verge in children. According to these authors, the examination needs to be explained to the parent even though, for reasons remaining unspecified, it can at times be embarrassing for a physician to explain and carry out RE in a child². In 1974, Greenberg proposed RE in children and/or rectovaginal palpation in teenage girls in the event of certain symptoms¹⁸.

In 2016, a review of the literature concluded that RE yielded important information for certain diagnoses and that the the risk-benefit balance provided arguments in its favor, even in vulnerable populations (children...)¹⁹. The authors recommended to doctors that they more regularly carry out RE while making sure that it take place under optimal conditions for patient and physician alike. They suggested that the procedure be explained to children with simple words and a dash of humor, even if this seemed more difficult when addressing teenagers. As for the theoretical indications to be privileged, during hospital treatment they most frequently included: diarrhea, constipation, fecal incontinence, abdominal pain, rectorrhagia, anemia, urinary disorders, neurological signs and, finally, gynecological symptoms

Step	MeSH Keywords	References
1	<i>Rectal examination</i>	(24), (25)
2	<i>Rectal examination, constipation</i>	(26), (27), (28), (29), (32), (33)
3	<i>Rectal examination, abdominal pain</i>	(6), (19)
4	<i>Rectal examination, diagnosis</i>	(20), (35)
5	<i>Rectal examination, child</i>	(21)
6	<i>Digital rectal examination, child</i>	(22), (23)
7	<i>Functional constipation</i>	
8	<i>Fecal impaction, child</i>	

Table 1 - The different steps of bibliographic research



in girls, and urogenital symptoms in boys.

Constipation, constipation treatment and RE

Seven articles and a clinical practice guide were analyzed.

In 1999, in a study by Gold *et al.*, a questionnaire was filled out by the parents of 128 children, aged from 1 month to 13 years and who had been referred to a pediatric gastro-enterology center by their GPs²⁰. Ninety-eight (77%) of the children had not had a digital rectal examination performed prior to referral. Among them, 53 were found to have fetal impaction (54%), and 19 to have minimal or no stool retention (21%). Following consultation in the specialized center, 70% of the children were treated with enema and laxatives, which are seldom prescribed by GPs. The authors concluded that in cases of chronic constipation, RE in general medicine could help to differentiate functional from organic causes. According to them, a number of consultations in specialized centers could thereby be avoided.

In 2006, in a retrospective study by Safder *et al.* on children with constipation referred to a pediatric gastro-enterology center, only in 15% of the cases had RE previously been carried out by a GP²¹. As second-line or specialized treatment, it had been performed in 96% of the cases, and the following diagnoses were given: soft stool (30%), anal fissure (21%), fecal impaction (19%), empty rectal ampulla (14%), hard stool (12%), hemorrhoids (4%) and anterior anal displacement (2%).

In 2001, Beckmann *et al.* sought out the clinical signs most closely correlated to a constipation diagnosis by plain abdominal x-ray in children ranging in age from 2 to 12 years²². Stools present during

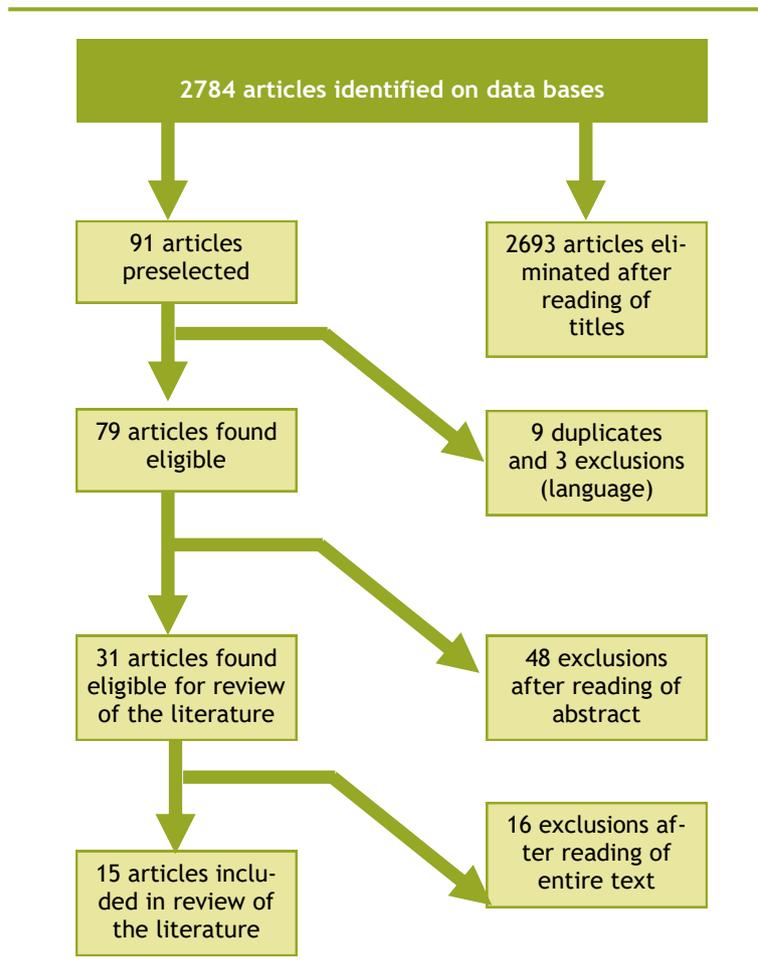


Figure - Flow diagram

rectal exam was found to be the best discriminator differentiating patients with from those without constipation (sensitivity: 77%; specificity: 35%; negative predictive value: 55%).

In 2011, a review of the literature by Mugie *et al.* came to the conclusion that by asking the right questions, conducting a thorough clinical examination including RE and bowel movement journal, it would be possible to arrive at a diagnosis of organic or functional constipation, provided that the testing be carried out by caregivers trained to interpret anorectal anomalies²³.

In 2012, Burgers *et al.*

compared the clinical approaches to childhood functional constipation of 1016 Italian, Dutch and American GPs²⁴. For 31% of the latter, RE was considered as a standard diagnostic tool for functional constipation, with significant differences between those from different countries (from 11% in the Netherlands to 54% in the United States).

In 2014, the European Society for Pediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) put forward some recommendations

for evaluation and treatment of childhood functional constipation in primary, secondary and tertiary care²⁵. As regards functional constipation in children more than 4 years old, the two learned medical societies recommended application of the Rome III criteria. Digital rectal examination was to be proposed not systematically, but only in the event of an alarm signal raising suspicions of an organic cause. However, the retrospective chart review carried out in 2015 by Kurowski *et al.* on children admitted to emergency departments following complaints of constipation or abdominal pain before or after caregivers were informed about the Rome III criteria showed that during post-educational (as opposed to pre-educational) periods, their performance of RE increased significantly (from 22.9 to 47.3%; $p < 0.001$)²⁶. On the other hand, utilization of an abdominal radiograph exam decreased even more significantly (from 69.5 to 26.4%; $p < 0.001$). According to the authors, RE improved diagnosis, without exposing the children under treatment to radiation.

As regards constipation treatment, Guest *et al.* have shown that oral laxatives were more effective in evaluation of childhood fecal impaction than manual evacuation by RE (97 vs 89%; $p = 0.001$)²⁷. As concerns adverse effects, in cases of manual evacuation vomiting was the most frequent of these (18 vs 2% with the other treatments; $p = 0.01$).

Suspected appendicitis, acute abdominal pain and RE

Out of the five articles taken into consideration, three had to do with children, and the other two with children and adults.

Suspected appendicitis

The diagnostic interest of RE in a context of suspected

appendicitis during admission to an emergency department was studied for the first time in 1985⁶.

RE was carried out in 328 children presenting with abdominal pain suggesting appendicitis. Severe discomfort was felt by 80 children and moderate discomfort by 121, while in 5 cases, the procedure could not be carried out. Among the 103 children presenting with histologically proved acute appendicitis, 55 showed anterior or right-sided tenderness, and 6 had swelling. Among the 98 children without histologically proved appendicitis, 12 showed rectal tenderness during RE.

Prior to their return home, 122 children were reexamined. While anterior tenderness was felt in 16, none of them had early postoperative abscess formation. Three patients, who were not among the 16, were subsequently readmitted to a hospital with pelvic abscesses⁶.

A review of the literature conducted in 2000 concluded that systematic RE was not justified in children with suspected appendicitis; it was found to be uncomfortable, of little or no diagnostic value, and in some cases traumatic²⁸.

Abdominal pain

In 1998, Scholer *et al.* retrospectively studied the frequency and clinical factors associated with RE in children suffering from acute abdominal pain for fewer than three days²⁹.

Out of 1140 children ranging in age from 2 to 12 years, RE was carried out in 4.9% (56); this occurred more frequently in cases of tender abdomen, constipation or rectorrhagia, and less frequently in cases of coughing, headache or throat pain. The 12 children for whom RE was of use in diagnosis

presented with constipation (5), gastroenteritis (3), appendicitis (2), abdominal adhesions (1) and abdominal pain of unknown origin (1).

Jesudason, a pediatric surgeon, has maintained that only experienced senior physicians should perform RE. According to him, student learning in the operating room should involve children under general anesthesia following agreement of parents and child when the latter is of sufficient age to offer it³⁰. In 2012, Wong *et al.* observed that patient refusal rate was lower in gastro-enterology than in general medicine, and that the low refusal rate appeared correlated to a practitioner's ease in explaining RE, carrying it out, and drawing a diagnosis from the results³¹.

Lastly, a review of the literature conducted in 2011 showed that an adult patient or a child admitted to an emergency room (ER) with a negative RE result was just as likely to be suffering from acute appendicitis as those in whom rectal tenderness was found through RE, also during ER consultation³².

DISCUSSION

Limitations

As concerns the methodological choices, the clinical symptoms taken into consideration during bibliographic research were selected on account of their being particularly prevalent in general medicine. If articles pertaining to abdominal traumas were excluded, it was because when they are presented, GPs usually opt for rapid hospitalization.

Selection and reading of the articles was carried out by a single researcher (HDDL). The studies on RE indications in cases of chronic functional constipation, abdominal pains and suspected appendicitis were



Article and author	Type of study	Level of evidence	Place	Population
Peditric rectal exam: why, when and how. Orenstein (2016)	Literature review	Medium	USA	NA
The rectal examination. A reminder of its importance. Greenberg (1974)	Expert opinion	Low	USA	NA
Frequency of digital rectal examination in children with chronic constipation Gold (1999)	Monocentric cohort	Medium	USA	128
Digital rectal examination and the primary care physicians: a lost art ? Safder (2006)	Monocentric retrospective study	Low	USA	96
Accuracy of clinical variables in the identification of radiographically proven constipation in children. Beckmann (2001)	Prospective study	Medium	USA	251
Constipation in childhood. Mugie (2011)	Literature review	Low	The Netherlands	NA
The care of constipated children in primary care in different countries. Burger (2012)	Multicenter prospective cohort	Medium	The Netherlands	383
Evaluation and treatment of functional constipation in infants and children. Recommendations from ESPGHAN and NASPGHAN. Tabbers (2014)	Guidelines	Low	Europe and North America	NA
Educational module improve emergency department evaluation for suspected constipation. Kurowski (2015)	Retrospective chart review	Medium	USA	NA
Rectal examination and acute appendicitis. Dickson, MacKinlay (1985)	Multicenter prospective cohort	Medium	Scotland	328
Medical myth. Brewster, (2000)	Literature review	Medium	USA	NA
Use of the rectal Examination on Children with Acute Abdominal Pain. Scholer, Pituch (1998)	Monocentric retrospective cohort	Low	USA	1140
Rectal examination in pediatric surgical practice. Jesudason, Walker (1999)	Expert opinion	Low	England	NA
Utility of the digital rectal examination in the emergency department: a review. Kessler, Bauer (2011)	Review of literature	Medium	USA	NA

Table 2 - Articles selected and level of evidence
NA : non-applicable

essentially second-line.

They were marked by selection biases: children included even if abdominal pain was not the main assessment criterion; plain abdominal x-ray (PAX) prescribed in order to rule out other diagnoses and not only in cases of constipation or in the event of abdominal pain²⁶. In numerous articles there exist memorization and subjective measurement biases (RE not performed in all patients), poor data gathering and missing data (RE performed without written evidence in patient files)^{20,24,29}. And the existing guides for practice were not exclusively addressed to GPs. Moreover, several of the articles selected and consulted consisted largely in expert opinions put forward during an epoch when ultrasound and scanners were not yet routinely used⁶. Finally, some of the studies were quite old, dating back to times when ethical considerations on respect for patients' bodies were less widely observed^{18,27}.

That much said, article selection was carried out exhaustively.

A procedure rarely necessary in general practice

This review of the literature shows that during GPs' first-line treatment of children, RE could present some interest in the event of constipation and abdominal pain, essentially as a means of clinically confirming the presence of fecal impaction in the absence of a suggestive palpable abdominal mass, in cases where questioning of the child and his parents has failed to suggest with a reasonable degree of certainty the existence of chronic constipation of functional origin. Moreover, digital rectal examination in children has imperatively got to be explained in detail and accepted only after due reflection

sensitivity and high-specificity imaging examinations such as ultrasound and scanning.

A complementary observational investigation could be carried out among GPs in order

to explore the role they assign to RE during treatment of a child suffering from constipation or acute abdominal pain.

Summary

Background. The digital rectal examination (DRE) is uncomfortable for the patient and has a poor specificity. With children presenting a digestive complaint in general medicine, the indication of a DRE should be carefully weighed.

Objective. To assess the usefulness of DRE in 2016 as a diagnostic tool in children with constipation or acute abdominal pain in general practice. **Method.** Medline, Cochrane Library, Science Direct, Google Scholar, La Revue Prescrire, La Revue du Praticien, French Health Authority, pediatric and gastroenterology guidelines databases were systematically searched from their creations to January 2016 with the following keywords: (digital) rectal examination, child, (functional) constipation, appendicitis, abdominal pain, fecal impaction, diagnosis.

Results. Fifteen articles were selected and analysed. The DRE requires both a technical and ethical medical training. After informed consent from the patient and his parents, DRE might be useful in confirming a diagnosis of fecaloma if the diagnosis of functional constipation still can't be established after appropriate history and abdominal examination. When suspecting an appendicitis in a child with acute abdominal pain, both sensitivity and specificity of the DRE are low and therefore DRE would not be helpful in the decision-making process.

Conclusion. In 2016, the DRE can be at most diagnostic tool in the management of a constipated child in general practice. Medical imaging has replaced the DRE, especially when suspecting an acute appendicitis.

→ **Key words:** digital rectal examination; child; constipation; abdominal pain.

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