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Original Research Article

Chronic Constipation in Children DEPT. of Pediatrics G.M.C. Chittorgarh

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Abstract:

The evaluation of chronic constipation with or without encopresis must begin with a careful history. The intervals between bowel movements and the size and consistency of stools deposited Into the toilet should be noted. Encopresis may be manifested as dirtying the underwear. The physical examination should include anorectal and neurological examination.

No specific organic cause can be found in the majority of children. One or several anorectal physiological abnormalities have been found by us and others in 80 out of 100 children with idiopathic constipation. These abnormalities include impaired rectal and sigmoid sensation and decreased rectal contractility during rectal distention. The external anal sphincter and pelvic floor muscles may be abnormally contracted during straining for defecation, and the child may be unable to defecate anorectal balloon. Most patients will benefit from a program designed to clear stools, to prevent further Impaction, and promote regular bowel habits. Fifty percent of patients will be cured after 1year.

Keywords: Chronic Constipation, Pediatrics, Infancy to Preschool Child, School-Age Child.

Introduction

Constipation with or without encopresis (fecal soiling)represents a common problem in children ,accounting for 3% of visits to the Pediatric Outpatient of ssg district hospital chittorgarh[1] as well as to a large general pediatric clinic[2] in Rajasthan and for25% of visits to a pediatric gastroenterology clinic. Constipation in child can be defined by a stool frequency of<3per week; but constipation can also be defined as the painful passage of bowel movements often accompanied by crying in young children or when stool retention with or without encopresis is present ,even when the stool frequency is <3per week. The aim of this article is to describe the symptoms of chronic constipation in infants and older children ; to present the differential diagnosis, algorithms for the evaluation of these children, and the treatment of constipation; and report on treatment outcome, because constipation in very young children and older children differs from constipation in adults.

Diagnosis

Infancy to Preschool Child

Difficulties with defecation are common in infants, toddlers, and preschool children. In our study 16% of parents of 22-month old children reported constipation in their toddlers. The male to female ratio is 1:1[3] 'Most often, the problem is short lived and of little consequence, but chronic constipation most often follows an inadequately managed acute problem.[4] The passage of stool is painful, and the child begins to withhold stool in an attempt to avoid the discomfort. The rectum accommodates the contents, and the urge to defecate gradually passes.

As the cycle is repeated, successively greater amounts of hard stool are built up in the rectum and passed with even greater pain, often accompanied by screaming and severe stool withholding maneuvers. Infants tend to extend the body and contract the anal and gluteal muscles, whereas toddlers often rise on their toes, hold their legs and buttocks stiffly ,and often rock back and forth holding on to a piece of furniture. Refusal to sit on the toilet, particularly during times of pain, is typical. The pain-based etiology is supported by data that state that 63% of children with encopresis had a history of painful defecation beginning before 36 months of age.[5]

School-Age Child

In general, the constipated school-age child is brought to medical attention because of fecal soiling, often of many years duration.[6] The fecal

soiling called encopresis is usually a complication of longstanding constipation. Encopresis is reported to affect 2.8% of4-year-olds,2.2% of 5-year-olds,1.9% of 6-year-olds,1.5% of 7- to 8-year-olds, and 1.6% of 10- to 11-year-olds[7] The male to female ratio for encopresis ranges from 2.5:1[8] to 3.4:1"to 6:1.' The frequency of encopresis varies among children as well as for a given child and can occur occasionally ,once a day ,or many times a day. Some children will have intermittent attacks of soiling. A soiling-free period may occur after a large bowel movement, and soiling will resume only after several days of stool retention. Usually the consistency of the stools found in the underwear is loose or clay-like. Sometimes the core of the impaction breaks off and is found as a firm stool in the underwear. Soiling most often occurs during the day only and frequently occurs in the afternoon, especially during exercise or during the walk home from school.

A careful history to elicit the intervals, size, and consistency of bowel movements deposited into the toilet will usually reveal the underlying constipation. Some children have daily bowel movements but evacuate incompletely, as evidenced by periodic passage of very large amounts of stool, sometimes large enough to clog the toilet. Severe attacks of abdominal pain can occur either just before a bowel movement, for several days before a large bowel movement, or daily. Many constipated children suffer from vague chronic abdominal pain.

Anorexia is often present. The majority often copretic children are developmentally normal. Bedwetting in 33% of patients, daytime urinary incontinence in 20% of patients, and recurrent urinary tract infections in10% off female patients are common symptoms in encopretic children. An abdominal fecal mass can be palpated in approximately half of the patients during the physical examination. Sometimes the mass extends throughout the en-tire colon but more commonly the mass is felt supra-pubically and midline, sometimes filling the left or the right lower quadrant. Usually, the rectum is packed with stool, either of hard consistency or, more commonly, the outside of the fecal impaction feels likely and the core of the impaction is rock hard. Some-times the retained stool is soft to loose. No rectal impaction is felt in an occasional child with a recent large bowel movement.

Differential Diagnosis

Ninety-five percent of children seen in the Encopresis have idiopathic constipation .No single mechanism is responsible for idiopathic constipation. Constitutional and inherited factors, such as intrinsic low motility, psychological factors, and painful defecation all contribute to constipation.[9]

There are rare organic conditions for constipation With and without fecal soiling such as anatomical, neurological, endocrine, and metabolic causes that should be considered and ruled out (Table 1). Usually this can be accomplished with a history, physical examination, and, if necessary, anorectal manometry, barium enema, and rectal biopsy.

Occasional constipation is due to an anatomical problem. Fistula, abscess, and hemorrhoids rarely occur in children. The passage of large, formed stools may be painful and result in anal irritation or an anal fissure and promote stool with holding maneuvers.

Anterior location of the anus is probably the mildest form of the anal atresia spectrum[10] Anterior location of the anus is seen in healthy as well as in severely constipated children. Abdominal pressure and bowel contractions thrust the stool bolus into a cul-de-sac posterior to the displaced anus. Unless the stool is very soft, it is difficult for it to "turn the corner" and exit through the anus. Most children with an anterior dis-placed anus will improve with medical treatment. Surgical intervention, like Hendren's posterior anoplasty," is rarely necessary.

A history of small diameter bowel movements and a tight anal canal felt during the rectal examination is suggestive for anal stenosis. Anal stenosis and secondary megacolon are often seen in children following surgical correction of anal atresia. These children will need anal dilation and often anoplasty. A normal neurological examination excludes disorders of the spinal cord such as meningomyelocele, tumor, trauma, or infection. Constipation is often seen

Table1: Causes of Constipation With or Without Fecal Soiling

Idiopathic constipation of childhood(90%—95%)Constipation secondary to anal lesions
Anal fissures
Anterio location of the anus
Anal stenosis and anal atresia
Neurogenic constipation
Disorders of the spinal cord, such as myelomeningocele or tumor
Cerebral palsy, hypotonia
Hirschsprung's disease

Chronic intestinal pseudo obstruction
Constipation secondary to endocrine and metabolic disorders
Hypothyroidism Renal acidosis Diabetes insipidus Hypercalcemia
Constipation induced by drugs Methylphenidate
Phenytoin
Lmipraminehydrochloride Phenothiazide

Antacids

Codeine-containing medication

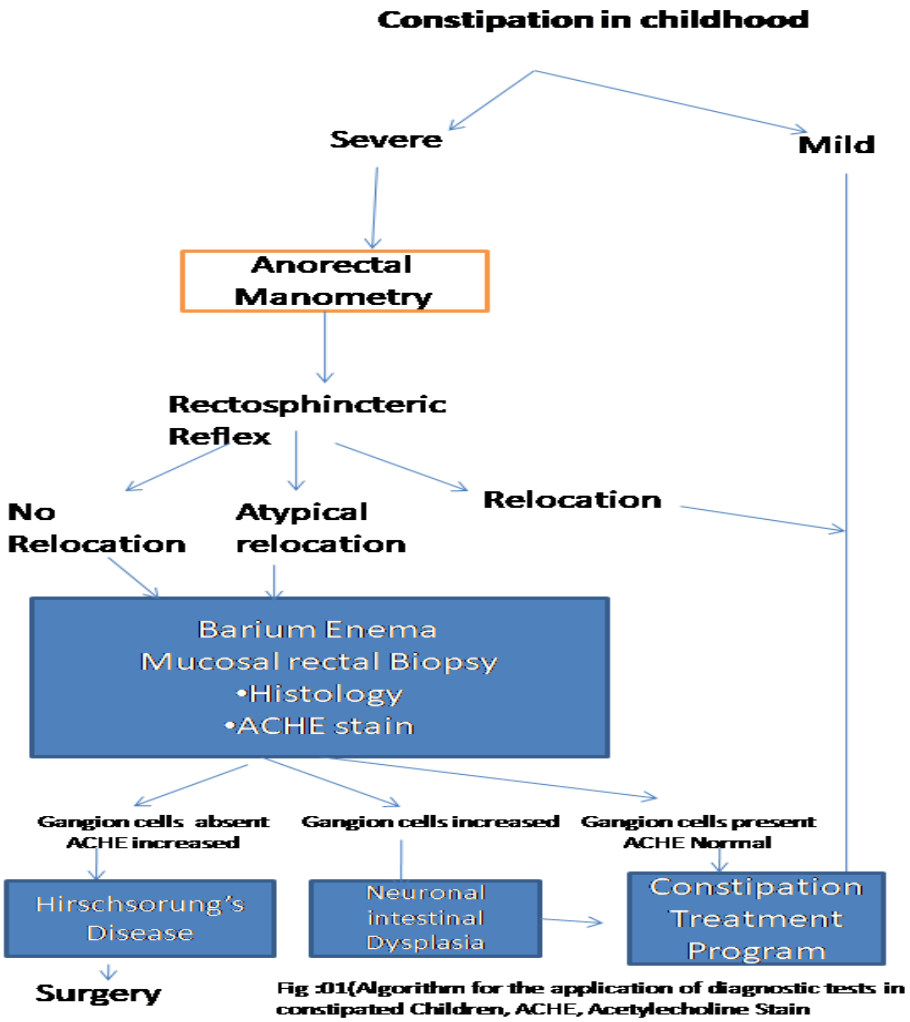

Figure 1:

In children with cerebral palsy, generalized hypotonia, Or mental retardation. Hirschsprung's disease(congenital aganglionic mega colon) is rare but needs to be considered in the differential diagnosis of any child of any age with severe constipation. The incidence is about 1 in 5000 births. Boys are affected 4 times more than girls. The usual presentation of neonatal Hirschsprung's disease is with constipation, abdominal distention, vomiting, or diarrhea.[11] Intractable constipation is seen in children with chronic intestinal pseudo obstruction, a rare but devastating disease that occurs in both sexes[12] It is characterized by recurrent symptoms of constipation, diarrhea, and gaseous abdominal distention. The term "chronic intestinal pseudo-obstruction" covers a variety of different disorders; in some cases, a specific myopathy is the problem, in others, a degeneration of the ganglia or the nerves occurs, and in some cases, no specific pathological alteration has been

detected. The disorder is occasionally familial, and the onset is often in childhood. A particularly severe congenital variant observed most often in female infants is associated with an abnormally enlarged bladder, the megacystis-microcolon-intestinal hypoperistalsis syndrome. Treatment of all forms of pseudo-obstruction remains symptomatic and inadequate. Pellet stools are seen in hypothyroidism and metabolic disorders associated with water depletion, such as Renal acidosis, diabetes insipidus, or hypercalcemia. Drugs such as anticonvulsants, psychotherapeutic agents, and codeine-containing cough syrups can cause constipation (Table 1). Whether dietary indiscretions such as lack of fiber or an overindulgence in cow's milk can cause severe constipation is not well established.

Investigation

A careful history and physical examination will allow the physician to make a decision regarding requirements for blood studies (deficiency or excess of thyroid or adrenal hormones, electrolyte imbalance s-calcium level), urine culture, radiographic studies, anorectal studies, or rectal biopsy. Most infants and children with chronic constipation require minimal work-up. Radiological studies are usually not indicated in un-complicated constipation. A plain abdominal film can be very useful in assessing the presence or absence of retained stool, its extent, and whether or not the lower spine is normal in an encopretic child with absence of a fecal mass on abdominal and rectal examination, in a child who vehemently refuses the rectal examination, or in a child who is markedly obese. It is thought unlikely that fecal incontinence is related to spinal disease without urinary symptoms or neurological abnormalities of the lower limbs.

Constipation in Childhood

Anorectal manometric assessment of children with mild constipation is not necessary(Figure1). The main role of anorectal manometry is in the evaluation of children with severe constipation in which the diagnosis of Hirschsprung's disease needs to be excluded. The internal anal sphincter does not relax during rectal balloon distention, absent recto-sphincteric reflex,in patients with Hirschsprung's disease. Numerous manometric studies have been per-formed in children with idiopathic constipation. Increased threshold to rectal distention and decreased Rectal contractility have been found in constipated children as compared with controls. In follow-up, after 3 years of therapy, most children will show continued abnormalities of anorectal function, leaving them at risk for recurrent problems.[13] Another abnormality is the failure of the external anal sphincter and pelvic floor to relax during defecation attempts.' This abnormality is found in many constipated children who do respond poorly to treatment.

When the history (early onset of constipation, severe constipation, absence of fecal soiling, small diameter stools) or the physical examination(failure to thrive, empty or small rectal ampulla with impacted stools in the proximal colon) suggest Hirschsprung's disease or when there is persistence of constipation despite adherence to the treatment program, anorectal manometry should be performed (Figure 1). If the recto sphincteric reflex is absent or atypical, barium en-ema and rectal biopsy need to be performed to deter-mine the presence of Hirschsprung's disease and other neuronal disorders(Figure1). Barium enema is unnecessary in uncomplicated cases of constipation but is helpful in the evaluation of the post-surgical rectum in patients undergoing surgery for anal atresia or Hirschsprung's disease, in the assessment of Hirschsprung's disease in which a transition zone between aganglionic bowel and ganglionic bowel may be seen, and in other neuronal disorders in which extensive bowel dilatation may be seen. Evaluation of total gut transit time with radio opaque markers is unnecessary in the evaluation of children with constipation. Whole gut transit is prolonged in constipated children, but the of question whether delayed transit is the effect of years of fecal stasis or whether it is due to an intrinsic intestinal motility dis-order cannot be answered.

Histological and histochemical in formation is obtained through the rectal biopsy. This is the only way of diagnosing Hirschsprung's disease and related neuronal disorders of the hindgut. The presence or absence of ganglion cells can be evaluated from the superficial sectional rectal biopsy.[14] False-negative results are possible. Absence of ganglion cells with in-creased staining of nerve trunks with acetylcholinesterase stain are diagnostic for Hirschsprung's disease. Full-thickness biopsies are necessary for the evaluation of other abnormalities of both the myenteric and submucosal plexuses, such as in hypoganglionosis- or hyperganglionosis[15].

Management

Most children with chronic idiopathic constipation with or without encopresis will benefit from a precise, well-organized plan. This treatment plan (seeFigure2)includes various forms of behavioral therapy and psychological approaches. The treatment of chronic constipation is comprehensive and has four phases: education, dis impaction, prevention of re-accumulation of stools, and reconditioning to normal bowel habits.

Education

It is important to point out that the stooling problem is not caused by a disturbance in the psycho-logical behavior of the child, is not the parent's fault, and that soiling occurs involuntary and usually without the knowledge of the child. Knowledge of the disorder and a detailed plan usually eliminates the parent's and the child's frustration and improves compliance for the prolonged treatment necessary.

Some of the parents do not possess the skills necessary to effectively manage their child's behavior, specifically in relation to following a demanding regimen. These parents need to be identified, so that the educational efforts can be optimized.[16]

Disimpaction

For disimpaction, a hypertonic phosphate enema can be used, with 1 oz/5 kg body weight in young infants and an adult-sized enema (4.5 oz) for children over 20 kg. In most children, one to two enemas will result in good bowel clean out. Hypernatremia, hyper-phosphatemia, hypocalcemia, hypokalemia, and dehydration have occurred occasionally after hypertonic phosphate enemas. Normal(isotonic) saline enemas may be used but are often not effective. Cleansing soap-suds enemas have occasionally resulted in bowel necrosis, perforation, and death[17] and tap-water ene-mas have occasionally resulted in water intoxication, hypervolemia, dilution of serum electrolytes, seizures, and death, and should be avoided. Children with mega rectum or megacolon who donot respond to phosphate enemas can be disimpacted with a hyperos-molar milk of molasses enema (1:1 milk and molasses)with the rectal infusion stopped when the child indicates discomfort (200—600 mL).

The milk of mol asses enema may need to be repeated. Lavage solutions, given orally or by nasogastric tube until clear fluid is excreted through the anus, can be used for disimpaction. It is recommended to give 5—10 mg metoclopramide by mouth 15 minutes before the lavage solution to reduce nausea and vomiting. Large volumes of lavage solutions are necessary; 750—1000 ml were given to children > 12 years of age, with disimpaction accomplished after an average amount of 11.8 Lover23 hours.

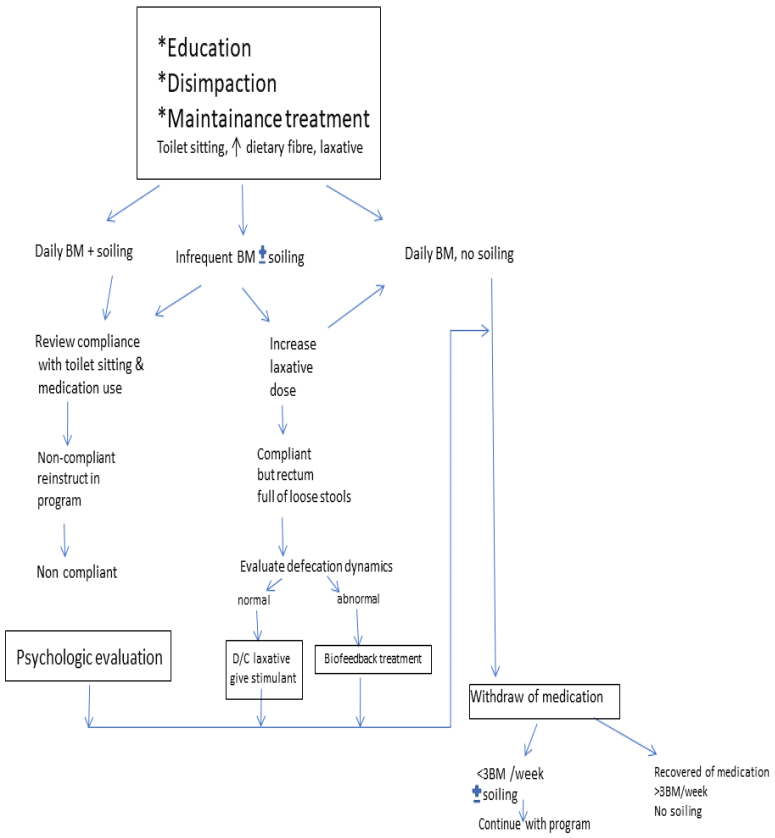

Fig 2. *algorithm for treatment of childhood constipation BM- bowel movement*

Figure 2:

Prevention of re-accumulation of stools. Fiber supplements or purified fiber are not suitable for children <4 years of age. Fiber found naturally in many foods can be used in infants<1year of age, such as pureed fruits, vegetables, and infant cereal. The parents of older children are encouraged to

give several Servings daily from a variety of fiber-rich foods such as whole grain breads and cereals, fruits, vegetable, and legumes. In most patients, daily defecation is maintained by the daily administration of laxatives beginning on the evening of the clinic visit. Laxatives should be used according to age, body weight, and severity of the constipation. Suggested dosages of commonly used laxatives are given in Table 2. It appears that the actual choice of medication is not as important as the child's and parent's compliance with the treatment regimen. There is only a starting dosage for each child, which must be adjusted to induce one to two bowel movements per day, loose enough to ensure complete daily emptying of the lower bowel and pre-vent soiling and abdominal pain. Once an adequate dosage is established, it is continued for approximately3 months to help the distended bowel to regain some of its function. Once regular bowel habits are established, the dosage can be reduced in small decrements. Laxatives need to be continued for several months and sometimes years at the right dose to induce daily soft stools.

Table2: Suggested Dosages of Commonly Used Laxatives

	Age	Dose
Malt soup extra ct	Infant Breastfed	5— 10 mL in 2—4 oz of(Malt supex)water or fruit juice twice daily Bottle fed: 7.5—30 ml in day total formula or 5— 10 ml in every second feeding
Karo syrup	Infant	Dose is the same as that of malt Soup extract
Milk of magnesia	>6mo	1—3ml, Kg body wt"'/day"', **Kg body wt"'•day"', 1—3m-L** Divide into l—2does
Mineral oil	>6 mo	Dose the same as that of milk of magnesia
Lactulose	>6mo	Concentration10g/l5mL:I—2 ml• kg body wt-'day"', divide into —2doses

Recondition the Child to Normal Bowel Habits by Regular Toilet Use

Toddler. Toilet training attempts are discouraged in a child less than 2 years of age resistant to potty sitting. First, normal bowel patterns are accomplished, and then, toilet training can be started or restarted. Older child**.** Defecation trials are very important and area must in any treatment program. The child is encouraged to sit on the toilet for up to five minutes, three to four times a day following meals.

The gastrocolic reflex, which goes into effect shortly after a meal, should be used to advantage. The children and their parents need to be instructed to keep a daily record of bowel movements, fecal soiling, and medication use. This helps to monitor compliance and helps to make appropriate adjustments in the treatment program by parents and/or physician.

Bio feedback treatment

An abnormality occurring in 25% to 53% of patients is abnormal defecation behavior. 'These children contract instead to relax the external sphincter and perineal muscles during defecation attempts. Patients with abnormal defecation dynamics are significantly less likely to recover after l year of conventional laxative treatment than patients with normal defecation dynamics.

The external anal sphincter and pelvic floor consist of striated muscles and are under voluntary control and, therefore, amenable to biofeedback treatment with resultant improved outcome.[19] 'Biofeedback treatment is labor intense, costly, and only available in a few specialist centers.

Follow-up Visits

The management of chronic constipation with or without encopresis requires considerable patience and effort on the part of the child and parents. Progress should be assessed frequently by reviewing the stool records and repeating the abdominal and rectal examination to be sure that the constipation is adequately treated. If necessary, dosage adjustment is made, and the child and parents are encouraged to continue with the regimen. After regular bowel habits are established, the laxative dosage is gradually de-creased while maintaining a daily bowel movement with no soiling.

Psychological Treatment

Adherence to the treatment program will improve the constipation and encopresis in all children. The presence of coexisting behavioral and psychiatric problems in children with chronic constipation and encopresis is often associated with poor treatment outcome. If the coexisting problem is secondary to chronic constipation and or encopresis, then it will improve with the treatment of constipation and encopresis. Children who do not improve should be referred for further evaluation, because continued encopresis can be due to noncompliance or control issues by the child and or the parent. Psychological intervention, family counselling, and occasional

hospitalization of the child for 2 to 4 weeks to get a treatment program started have helped some of these unfortunate children.

Outcome

Long-term follow-up studies of 100young constipated patients, who were initially evaluated and treated when <4years of age, revealed that 63% had recovered. Twelve-month follow-up studies in patients > 5 years of age treated at the at SSG chittorgarh showed that approximately50% of patients will be off laxatives and have<3bowelmovements/week and no soiling. 'Another20% may be weaned off the laxative within 2 years.

The remainder will require laxatives for daily bowel movements or continues oiling for many years and occasionally into adulthood. Twelve-month follow-up studies of patients in chittorgarh showed 51% had recovered after receiving laxatives and behavior modification. Recovery or non-recovery from chronic constipation with or without encopresis depends on the severity of the underlying constipation and the anorectal manometric abnormalities.'

Children with severe impairment in rectal sensation and rectal contractility were significantly less likely to recover than those with mild impairment.' Children who abnormally contracted the external anal sphincter and pelvic floor during defecation attempts were significantly less likely to recover than those who relaxed these muscles. In them, outcome can be improved by teaching normal defecation dynamics.

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