

Constipation a Commonly Unrecognized Cause of Enuresis

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• Constipation was confirmed by history, rectal examination, and rectal manometric studies in 22 of 25 children with enuresis. Treatment of constipation resulted in resolution of enuresis. Uninhibited bladder contractions, observed in enuretic constipated children, were also noted in children with constipation alone, suggesting that constipation is a commonly unrecognized etiologic factor in enuresis.

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Enuresis presents a major management problem in the field of pediatric nephrourology. This condition results in major psychologic effects in children affected. It has been attributed to psychologic dysfunction¹ and abnormalities of neurologic control of bladder function² and has been treated with systemically acting drugs such as imipramine³ and vasopressin,⁴ all with potentially serious side effects and none with a completely satisfactory result.

We previously noted that constipation as determined by history, examination, and rectal manometry is associated with recurrent urinary tract infection in children.⁵ Treatment of constipation results in cessation of recurrent infections. We noted that over 60% of children with recurrent urinary tract infection also suffered from enuresis and commonly had reduced bladder capacity⁵ similar to that reported in enuretics.⁶ Treatment of the constipation resulted in resolution of enuresis in addition. We therefore studied a group of children who had enuresis alone in the absence of infection or urologic abnormalities of

the urinary tract to determine the presence or absence of constipation and effect of therapy for constipation on constipated enuretics.

PATIENTS AND METHODS

In our subspecialty clinic, in general only major problems relating to renal dysfunction are seen, the majority of enuretics being cared for by general pediatricians in the community. Thus, the patients studied were those referred for assessment to eliminate renal pathologic conditions as an underlying cause of enuresis.

Subjects of the study were 29 children, 25 of whom had been referred for assessment and treatment of enuresis. Four patients had severe functional constipation in the absence of urinary symptoms.

Of 25 enuretic children studied, 22 had histories of constipation. Constipation were considered present if there was (1) more than a 72-hour interval between bowel movements; (2) presence of overflow incontinence (encopresis); (3) the passage of small, hard, scabulous stools with intermittent passage of large stools; (4) poor emptying and dilatation of rectal ampulla after defecation as determined by rectal examination; and (5) grossly decreased level of perception and increased tolerance to balloon insufflation during rectal manometry combined with any element of the four alone.

Of 22 enuretic children with constipation, all had a history of the passage of infrequent large stools and rectal ampulla dilatation as determined by rectal examination and rectal manometry. Seventeen consented to aggressive treatment of constipation; of these ten were girls and seven boys. The mean age of the treated group was 8.47 ± 2.9 years. Two children had day wetting, six were enuretic at night, and nine were enuretic during the day and night. All had at least one episode of enuresis during each 24-hour period. All had normal renal function.

Rectal manometric studies were done using an air-filled balloon system.⁷ We noted the smallest inflation volume perceived by the patient, the volume at which relaxation of the internal sphincter occurred, and the maximum inflation volume that was tolerated by the patient without

pain or discomfort. Functional constipation was deemed to be present when the following elements were noted: (1) a decrease in perception and an increase in tolerance in response to large-volume stimulation by rectal balloon and (2) the presence of normal anorectal relaxation. In addition, four patients who had chronic functional constipation were studied.

Of the 22 constipated patients with enuresis, 19 underwent urodynamic studies. The four patients with constipation alone in the absence of urinary tract symptoms also underwent urodynamic studies.

The presence of uninhibited bladder contractions was determined by urodynamic studies. Patients were placed in the lithotomy position. After disinfection and draping, a 7 F single microtip transducer catheter was passed into the bladder per urethra and the bladder was filled with saline. A balloon filled with water was placed in the rectum to register intra-abdominal pressure variations. Circular surface electrodes were placed on each side of the anus for perineal electromyography.

The child was seated on a flowmeter chair and data were recorded on a six-channel recorder. The recorder noted simultaneously the total bladder pressure, the intra-abdominal (rectal) pressure, and the intrinsic bladder pressure. The bladder was filled with 0.9% sodium chloride at room temperature, and two to three complete voiding cycles were registered for each child.

Bladder instability was considered present if at least one of these elements was identified: (1) the presence of uninhibited contractions of the detrusor during the filling phase of the bladder with an amplitude equal to or greater than 15 cm H₂O and (2) the occurrence of detrusor contraction at the end of or after urinary flow.

Seventeen patients consented to undergo treatment with phosphate enemas (Fleets) using the following schedule: one enema per day for one month, once every other day for a further month, and twice a week for an additional month thereafter. Mothers were advised to alter the dietary habits of their children, eliminating constipating elements and increasing the fiber content of the diet. Mothers were asked to keep written records of the frequency of defecation, and confirmation of the passage of normal

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bowel movements was obtained by the mother once a day prior to cessation of therapy.

RESULTS

Of the 25 enuretic patients, 22 had histories consistent with the presence of constipation. The 22 patients had decreased perception of rectal distention by balloon insufflation (normal, 10 to 20 mL; patients, >40 mL).⁷ In addition, all 22 had increased tolerance in response to a large-volume insufflation of the rectal balloon (normal, discomfort at 30 to 40 mL; patients, >80 mL).⁷ The majority of patients could tolerate 110 mL, ie, maximal balloon insufflation, without discomfort. This represents a sphere of 6.5 cm in diameter in the rectum. The three patients without histories of constipation had normal rectal perception and tolerance by rectal manometry.

All patients who had enuresis and who underwent urodynamic study also had uninhibited bladder contractions as previously described. All four patients who had severe functional constipation without urinary symptoms also had uninhibited bladder contractions.

The mean response time to treatment of enuresis as indicated by cessation or improvement in enuresis was 16 ± 10 days (mean \pm 1 SD) with a range of three days to six weeks prior to resolution. After a follow-up period of 9.2 months, five of the seven male patients had termination of their enuresis and two had partial responses with a decrease in bed-wetting from seven times a week to once a week. Of the ten girls, nine had complete responses and one had an episode of bed-wetting once a week. Of the five patients who failed to undergo therapy, one was treated with imipramine hydrochloride, with cessation of enuresis while receiving the drug. The other four continued to have enuresis.

COMMENT

Therapy for enuresis presents a major problem for pediatric nephrologists and urologists. Psychologic stress inflicted on the patients by discomfort of bed-wetting and by parental reaction is considerable. Various therapeutic modalities have been

used, including alarm devices⁸ and systemically acting drugs,^{3,4} none of which is completely satisfactory. The exact etiology of enuresis is unknown, and various factors, such as psychologic trauma initiating enuresis and immaturity of corticospinal reflexes,³ have been stressed. Berger et al⁹ noted decreased bladder capacity in relation to age in many patients with enuresis. Uninhibited bladder contractions are also a common feature of enuresis in the presence of normal urine-concentrating ability.⁹ In a previous study, we noted that constipation was associated with recurrent urinary tract infections in girls.⁵ Since cessation of enuresis associated with urinary tract infection followed aggressive treatment of constipation, we similarly studied boys and girls with enuresis alone to determine whether constipation was also present. In over 40% of these cases, encopresis was also present. Though great stress has been laid on the study and treatment of enuresis in boys, enuresis appears in our experience to be a not uncommon problem in girls.

By history, physical examination, including rectal examination, and rectal manometric studies, constipation was an extremely common though often unrecognized accompaniment of enuresis. Treatment of the constipation in an aggressive manner to allow for evacuation of the rectum and its maintenance in an empty state until normal rectal tone returned resulted in rapid resolution of enuresis. Enuresis is commonly associated with constipation. Of the constipated patients studied by Shopfner,¹⁰ demonstrating radiologic distortion of the genitourinary tract, 54% had enuresis. These patients had distortion of the bladder wall, suggesting that compression of the bladder wall by the distended rectum might result in decreased bladder capacity and consequent enuresis. Baumann and Hinman¹¹ noted the association of urinary tract infection, enuresis, and encopresis and emphasized the value of hypnotherapy in resolving the enuresis. They stressed the necessity of treating the constipation. Studies by Bailey et al¹² noted a 55% incidence of abnormal anal sphincter electromyograms in children with enuresis. These observations

substantiate the role of abnormalities of the rectum in causing enuresis and urinary tract infection in children. The observation that children with functional constipation may have uninhibited contractions of the bladder in the absence of urinary symptoms substantiates this postulate. We surmise that in chronically constipated children, the rectum is never empty, necessitating the repetition or maintenance of rectal sphincter complex contraction to maintain fecal continence. Consequent concomitant urethral sphincter contraction occurs. In the presence of decreased bladder capacity and uninhibited bladder contractions, possibly induced by pressure on the posterior bladder wall by a dilated rectum, enuresis ensues.

Pharmacologic manipulation, psychologic conditioning, and other forms of therapy have been used in the management of enuresis, with guarded success. The cause of enuresis in the presence of normal renal function is ill defined. Our studies strongly implicate unrecognized rectal distention as an etiologic factor of enuresis.

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