Constipation: a cause of enuresis

D. Anagnostopoulos1, J. Mavromihalis2, A. Markantonatos1, and E. Lappas1

1 Department of Pediatric Surgery, Aristotelian University, Thessaloniki, Greece
2 Department of Pediatrics, 2nd Clinic Aristotelian University, Thessaloniki, Greece

Abstract. Chronic functional constipation was confirmed by history, rectal examination, and rectal manometric studies in 20 of 26 children with enuresis. Treatment of constipation resulted in resolution of the 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.

Key words: Constipation — Enuresis

Introduction

Enuresis presents a major management problem in the field of pediatric nephrourology. This condition results in major psychologic effects in affected children. It has been attributed to psychologic dysfunctions [1] and abnormalities of neurologic control of bladder function [20], and has been treated with systemically acting drugs such as imipramine [10] and vasopressin [15], all with potentially serious side effects and none with a completely satisfactory result.

Recent studies have noted that constipation as determined by history, examination, and rectal manometry was associated with recurrent urinary tract infections in children and that over 60% of them also suffered from enuresis and commonly had a reduced bladder capacity similar to that reported in enuretics [1, 3, 4, 5, 7, 12, 13]. Treatment of the constipation also resulted in resolution of the recurrent infections and enuresis. We studied a group of children who had enuresis in the absence of infection or urologic abnormalities of the urinary tract to determine the presence or absence of constipation and the effect of therapy of the constipation on the constipated enuretics.

Patients and methods

Subjects of the study were 35 children, 26 of whom had been referred for the assessment and treatment of enuresis. Nine patients had severe functional constipation in the absence of urinary symptoms.

Of the 26 enuretic children, 20 had histories of constipation. Constipation was considered present if there was: (1) more than a 72-h interval between bowel movements or not more than three times per week; (2) secondary encopresis; (3) the passage of small, hard, scibalous stools; (4) poor emptying and dilatation of the rectal ampulla as determined by rectal examination; (5) decreased amplitude of the rectoanal inhibitory reflex; and (6) markedly unstable pressures in the upper anal canal with changes exceeding 25 cm H2O.

Rectal biopsies were obtained in patients who had a rectoanal inhibitory reflex.

Of the 20 enuretic children with constipation, all had a history of the passage of infrequent, large stools and rectal-ampullar dilatation as determined by rectal examination and rectal manometry. All consented to aggressive treatment of the constipation; 10 were girls and 10 were boys. The mean age of the treated group was 8.47 ± 2.9 years.

Two children had day-wetting, 6 were enuretic at night, and 12 were enuretic during both day and night.

In 17 cases the enuresis was primary, in 3 others the family affirmed that there had been a dry period. The 3 patients with secondary enuresis were all boys; 2 had enuresis during both day and night and 1 had diurnal enuresis only. Nine had moderate enuresis, but 11 (6 girls and 5 boys) had severe enuresis, more than three episodes during each 24-h period. Two had diurnal enuresis and 9 had nocturnal and diurnal enuresis. All of them had normal renal function and were chronically constipated as well.
Rectal manometric studies were done using an air-filled balloon system. We noted the smallest inflation 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 a rectoanal inhibitory reflex. In addition, 9 patients who had chronic functional constipation were studied. All the constipated patients with enuresis and the 9 patients with constipation in the absence of urinary tract symptoms 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 urethram and the bladder was filled with saline. A balloon filled with water was placed in the rectum to register intra-abdominal (endorectal) pressure variations. Circular surface electrodes were placed on each side of the anus for perineal electromyography.

The child was seated on a flowmeter chair with a six-channel recorder. The recorder noted simultaneously the total bladder pressure, endorectal pressure, and bladder pressure. The bladder was filled with 0.9% sodium chloride at body temperature and 2 to 3 complete voiding cycles were registered for each child.

Bladder instability was considered present if at least one of the following findings occurred: the presence of uninhibited contractions of the detrusor during the filling phase with an amplitude equal to or greater than 15 cm H2O, and the occurrence of detrusor contractions at the end of or after urinary flow.

All 20 constipated patients with enuresis were placed on a vigorous enema program to completely cleanse the colon of impacted stool. Tap water enemas (20 ml/kg body weight) were then administered daily for an additional month thereafter.

Mineral oil at a dose of 10-30 ml one to three times a day was begun and continued throughout the course of treatment. Of the 10 girls, 8 had complete responses and 1 had an episode of bed-wetting once a week. Of the 4 patients who failed to undergo therapy, 1 boy was treated with imipramine hydrochloride with cessation of the enuresis while receiving the drug. This boy had primary nocturnal enuresis. The other 3, 2 boys and 1 girl, continued to have enuresis: 1 boy and 1 girl had primary diurnal and nocturnal enuresis and 1 boy had secondary diurnal enuresis (Fig. 1). All had chronic constipation and severe enuresis.

Discussion

The therapy of enuresis presents a major problem for pediatric nephrologists and urologists. Psychologic stress inflicted on the patients by the discomfort of bed-wetting and by parental reaction is considerable. Various therapeutic modalities have been used, including alarm devices [8] and systemically acting drugs [10, 15, 19]; none of the treatments is completely satisfactory. The exact etiology of enuresis is unknown, and various factors, such as psychologic trauma and immaturity of corticospinal reflexes [10], have been proposed.

![Diagram](Fig. 1) Twelve enuretic patients with constipation. Results after treatment of constipation.