Enuresis

Description/Etiology

Enuresis is involuntary voiding of urine by individuals who are older than the age at which bladder control is normally established (e.g., persons who are > 5 years of age). Although enuresis can occur in adults, most often it occurs in children; the information that follows focuses on enuresis in children. Enuresis can lead to physical and psychological complications, including increased risk for urinary tract infection (UTI), low self-esteem, aggression, acting out, rejection by peers, social isolation, and angry or punitive actions by parents. The emotional and psychologic effects of enuresis on both the child and family can be considerable.

Enuresis is classified as either primary or secondary. Eighty percent of cases of enuresis are primary, in which enuresis is present in a child who has not yet developed sustained bladder control. Secondary enuresis, which accounts for the remaining 20% of cases, is diagnosed in individuals who have a history of bladder control lasting at least 6 months before developing incontinence. Enuresis that occurs at night is called nocturnal enuresis (commonly called bedwetting; also called monosymptomatic enuresis) and enuresis that occurs during the day when the individual is awake is called diurnal enuresis. In some patients, enuresis occurs during both night and day and is called nocturnal and diurnal enuresis (also called nonmonosymptomatic enuresis).

Enuresis can be precipitated by a number of factors, including small bladder capacity relative to age, overactive bladder, increased urine production due to decreased levels of vasopressin (i.e., antidiuretic hormone that reduces urine production during sleep), arousal disorders that prevent the child from waking up in response to signals of a full bladder, and constipation, which puts pressure on the bladder and reduces bladder capacity and/or induces involuntary contractions. Additional causes of enuresis include cystitis (i.e., inflammation of the urinary bladder), sleep-disordered breathing, diabetes mellitus, diabetes insipidus, seizure disorder, urethral obstruction, neurogenic bladder, certain medications (e.g., selective serotonin-reuptake inhibitors, valproic acid, cloZAPine), and psychologic stress.

Enuresis is diagnosed when unintentional voiding occurs at least twice a week for 3 months or when enuresis and related complications cause psychologic distress or functional impairment (e.g., social problems, difficulty in school or work). Diagnosis is made based primarily on patient history and physical examination; laboratory tests and imaging studies can be performed to identify underlying causes of enuresis.

Treatment includes identification and resolution of an underlying cause (e.g., infection, chronic constipation, psychologic stress) if possible, use of moisture alarm devices, medication (e.g., oral desmopressin acetate, which is a synthetic replacement for vasopressin that decreases nocturnal urine output and is prescribed for nocturnal enuresis), and/or psychologic counseling. Guidelines for the management of enuresis in children and adolescents issued by the United Kingdom’s National Institute for Health and Care Excellence (NICE) recommend that the use of moisture alarm devices or medication be selected based on the impact of bedwetting on the patient’s/family’s quality of life, the desired outcome of treatment (e.g., short-term or long-term resolution), and the patient’s/ family’s ability to cope with treatment (e.g., their willingness to consistently use a nighttime moisture alarm device). In general, treatment using a moisture alarm device is associated
with sustained long-term resolution of enuresis, whereas treatment with desmopressin is selected to achieve rapid, short-term results. (For more information on the use of moisture alarm devices in the treatment of children with nocturnal enuresis, see Evidence-Based Care Sheet: Enuresis, Nocturnal: Behavioral Interventions -- Alarms) Supportive strategies, such as counseling about restricting eating and drinking before bedtime, and simple behavioral interventions are recommended before initiating treatment with a moisture alarm device or medication. Parental education regarding the child’s inability to control enuresis is important to avoid potential psychologic damage that can result from punishing, shaming, or otherwise pressuring a child with enuresis. The prognosis is good, and enuresis usually resolves by adolescence.

**Facts and Figures**

Enuresis affects 5–7 million children in the United States. The condition is three times more common in males than in females. The prevalence of enuresis is 40% in 3-year-olds, 10% in 6-year-olds, 3% in 12-year-olds, and 1% in adults. The rate of spontaneous remissions is ~ 15% per year and 99% of cases resolve by age 15 years. Approximately 75% of patients with enuresis have a first-degree relative with the condition.

**Risk Factors**

Risk factors include low vasopressin levels, excessive consumption of liquids before sleep, inability to arouse from sleep when the bladder becomes full, developmental delay (e.g., in level of maturity and/or the neurologic system), family history of enuresis, constipation, lack of or poor toilet training, UTI, certain mental health disorders (e.g., depression, anxiety, social phobias, conduct disorder, attention deficit hyperactivity disorder [ADHD]), child abuse, allergic disorders (e.g., allergic rhinitis, atopic dermatitis, allergic conjunctivitis), obstructive sleep apnea, and certain other medical conditions/disease states that are associated with enuresis (for details, see Description/Etiology, above).

**Signs and Symptoms/Clinical Presentation**

Nocturnal enuresis often occurs soon after falling asleep during the rapid eye movement (REM) (i.e., heavy, deep sleep) stage of sleep. Children with diurnal enuresis can have a sudden urge to urinate in response to bladder contractions that are caused by increased intra-abdominal pressure that results from laughing, crying, or sneezing. Children can urinate involuntarily while awake because they wait too long before going to the bathroom, fear using the toilet as a result of social anxiety, or are unaware of the need to urinate due to preoccupation with an activity (e.g., watching television, playing video games). Enuresis can occur in children with other delays in maturation, including language, motor skills, and social development.

**Assessment**

- **Patient History**
  - Ask about history of urination (e.g., frequency, timing, volume), parental response to enuresis, toilet training, behavior problems, and stressful events or changes in the home
  - Parental documentation of fluid intake and voiding in a diary can be requested because it is helpful in identifying patterns
- **Physical Findings of Particular Interest**
  - Physical examination might identify genital irritation or infection, constipation, or medical causes of enuresis such as labial fusion; meatal stenosis; and abdominal mass, lower back cutaneous lesion, or an asymmetric gluteal cleft, which can indicate spina bifida
- **Laboratory Tests**
  - UA might show increased urine glucose and osmolality, which can indicate diabetes mellitus, or might show the presence of blood, which can indicate UTI
  - Urine culture can be ordered to determine the appropriate antibiotic for a UTI
- **Other Diagnostic Tests/Studies**
  - Measurement of bladder capacity can be ordered if a small bladder is suspected
  - Renal and/or abdominal ultrasound and a voiding cystourethrogram can be ordered if structural abnormalities are suspected
  - Sleep studies can be ordered if sleep abnormalities are suspected
  - Neurologic examination can identify seizures that can cause of enuresis

**Treatment Goals**

- **Promote Resolution of Enuresis and Emotional Well-Being**
  - Monitor vital signs, assess all physiologic systems, and review results of laboratory/other diagnostic studies; immediately report abnormalities and provide or assist with initiation of prescribed treatment
Talk with the patient/parents to gather information and provide supportive care (e.g., ask about the patient’s eating, drinking, and daytime toileting habits; suggest using positive reinforcement [i.e., a reward system] for keeping a dry bed, if appropriate) before initiating the prescribed treatment (e.g., moisture alarm device, pharmacotherapy).

Educate the patient/parents about the use of a prescribed moisture alarm device.

- NICE recommends that the patient’s response to moisture alarm device be assessed within 4 weeks and treatment be stopped if there are no early signs of response; treatment should be continued if the patient is demonstrating early signs of response. Alarm treatment can be discontinued when the child has 14 consecutive dry nights.

Administer medications, as ordered, which can include oral desmopressin acetate or imipramine (i.e., a tricyclic antidepressant) to inhibit urination, although the mechanism for inhibition is unknown. Anticholinergics (e.g., oxybutynin, tolterodine) inhibit bladder contraction and can be prescribed in combination with desmopressin or imipramine or as adjunctive treatment with a moisture alarm device.

If enuresis is due to or results in psychologic distress, request referral to a mental health clinician for counseling and training in behavior modification, which can be helpful in resolving enuresis.

Initiate bladder training if ordered as treatment of enuresis.

- Assess patient/parental anxiety level, coping ability, and for knowledge deficits regarding enuresis; provide emotional support, educate, and encourage discussion about enuresis etiology, potential complications, treatment risks and benefits, and individualized prognosis. (For more patient education, see What Do I Need to Tell the Patient/Patient’s Family?, below)

- Assess risk for child abuse resulting from enuresis, and follow facility protocols for mandated reporting of criminal activity if appropriate

- Encourage parental involvement in patient care, as appropriate, and follow facility protocols regarding rooming-in of parents for pediatric patients.

**Food for Thought**

- Moisture alarm devices appear to be more effective than tricyclic antidepressants in the treatment of nocturnal enuresis in children. Cochrane reviewers analyzed 64 studies involving 4,071 children and found that the rate of treatment failure was 67% with imipramine and 17% with alarms (Caldwell et al., 2016).

- Researchers in a study in which 559 children were followed from age 3 years to age 9 years found that both child anxiety and history of maternal anxiety were both risk factors for enuresis (Kessel et al., 2017).

- In a study of 32 children with nocturnal enuresis, all of whom had sleep problems, 91% reported sleeping better and 75% experienced resolution of enuresis with melatonin (Waters et al., 2017).

**Red Flags**

- Children with enuresis are at risk for child abuse because of parental frustration.

- Acute water intoxication is an extremely rare and potentially fatal adverse effect of desmopressin that can occur if fluid intake is not limited while receiving desmopressin. The nasal-spray formulation of desmopressin is no longer recommended because of its association with most cases of water intoxication. Water intoxication signs and symptoms include headache, nausea, and vomiting (for more information, see Quick Lesson About … Water Intoxication in Children).

- Children with nocturnal enuresis can demonstrate poor grades or under-achievement in school because of sleep disruption.

**What Do I Need to Tell the Patient/Patient’s Family?**

- Provide written information about enuresis, if available, to reinforce verbal education.

- Reassure the child and parents that enuresis almost always resolves with time; emphasize the importance of having patience, adhering to the prescribed treatment regimen, and avoiding punishment of the child.

- Suggest using the following nonpharmacologic interventions to resolve enuresis:
  - Reminding the child to urinate frequently during the day, limiting evening fluid intake, and having the child void at bedtime. Parents should awaken the child at regular intervals during the night to urinate.
  - Covering the mattress with plastic so the child is awakened when urine contacts the skin; use of diapers should be avoided because their use can be perceived by the child to mean that bedwetting is acceptable behavior.
  - Reinitiating bladder training, including having a regular toilet routine.
  - Showing continued encouragement and support for the child, particularly during relapses, which are common.

- For information about behavioral and pharmacologic interventions for enuresis, see the series of Evidence-Based Care Sheets about nocturnal enuresis.
Emphasize the importance of continued counseling/psychotherapy to assist children who are coping with stressful or traumatic events, as appropriate

Refer parents to the National Kidney Foundation at https://www.kidney.org/patients/bw/BWbedwetSecondary for additional educational information and identification of support organizations

References


