



child & youth

Pediatric Telehealth Rounds

Today's topic:

**Primary Nocturnal
Enuresis: An Approach to
Diagnosis and
Management**

Speaker:

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Friday December 18 2015

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Declaration of conflict

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Objectives

1. To be comfortable diagnosing primary nocturnal enuresis
2. Know the use of alarm devices
3. Know the options for pharmacological therapy and how to prescribe medications
4. Know the options for behavioural therapy
5. Recognize the psychological impact on the patient and family and how to provide support

Case:



- 10 year old boy presenting to pediatrician's office for consultation regarding bed wetting
- Child seems shy and parents give most of the history, they are worried about his development given that he still wets the bed
- **HPI:**
 - Has never been dry overnight, no daytime issues, he is a very deep sleeper
 - They have tried some behaviour modification, he is not allowed to drink an hour before going to bed and voids right before bed. They tried setting an alarm for themselves and waking him up over night but this didn't help.

Case: Continued

- **PMHx:** otherwise healthy, no history of UTIs, no meds, IUTD, does well in school no history of learning disability
- **ROS:** Patient has large hard stools and stools every 5 days, this is his “normal”
- **FamHx:** Mom wet the bed until 13 years old
- **SocHx:** no recent stressors
- **Physical Exam:** normal exam



Definitions

- **Primary nocturnal enuresis** = involuntary discharge of urine at night by children old enough to be expected to have bladder control
- **Primary monosymptomatic nocturnal incontinence (PMNE)** = lifelong nocturnal enuresis without history of lower urinary tract symptoms or bladder dysfunction
- **Nonmonosymptomatic nocturnal enuresis (NMNE)** = variety of different reasons for enuresis such as UTI, diurnal enuresis, anatomical or neurologic bladder dysfunction

Primary vs Secondary

- **Primary** - when bladder control has never been attained
- **Secondary** - when bladder control was attained (at least 6 months of continence) and incontinence reoccurs

Physiology

- **Variation in the development of normal bladder control**
- Strong genetic component, usually family history, some research has shown a gene on chromosome 13q is involved
- May be associated with deep sleep patterns, most families report the child is a “heavy sleeper,” difficulty with sleep arousal
- Some have nocturnal polyuria (urine production $>130\%$ of child's expected bladder capacity)
- Some have small bladder capacity

Epidemiology

- Males > Females
- Bedwetting is found in 10-15% of children age 5-6yo, 6-8% of children 8yo and 1-2% by teenage years
- More common when a first degree relative has a history of primary nocturnal enuresis
- If both parents have a history of primary nocturnal enuresis up to $\frac{3}{4}$ of their children will have it

Patient Assessment

- Complete history and physical exam
 - Screening questions:
 1. Previously dry for 6 months?
 2. Associated with daytime urine control issues?
 3. Constipation, fecal soiling?
 4. Severe recent stress? Important to identify psychological stressors
- If the above are positive consider secondary cause

History

- How many nights per week does it happen? What is the bedtime routine? Fluid consumed in the evening? Voiding prior to bedtime?
- What has the family tried and what was the outcome?
- History of straining, urinary retention or feeling of incomplete voiding? History of UTIs? – suggest underlying voiding problem
- Good screening history for constipation – what is the child’s “normal pattern”
- Screen for OSA, sleep disordered breathing
- **Degree to which child is bothered by the problem** – should only be treated where it poses a significant problem for the child
- Typically family is more affected than the child, need the child to be motivated for behavioural interventions to be successful

Physical Exam

- HEENT – enlarged tonsils
- Abdo – check for palpable bladder, stool in LLQ
- GU – males rule out meatal stenosis and females rule out labial adhesions, important to assess for rashes/skin changes related to chronic wetness
- Assess for any stool streaking suggestive of encoporesis or constipation, look for fissures/tears
- Neuro – perineal sensation
- Spine – look for dimples, tufts, asymmetric gluteal cleft (underlying spinal cord problem)

Investigations

- If history and physical exam are completely reassuring, low pretest probability for urinalysis and potential for false positive
- Judicious use of investigations, not routine
- Urinalysis – look for UTI, proteinuria or hematuria
- Diary of voiding and stool pattern

Diagnosis

- Based on complete history and physical exam



Management

- Reassurance, support and avoidance of punishment
- Communicate openly with child and parent
- Parents may need reassurance
- Enuresis should only be treated with pharmacotherapy and alarms in cases where it poses significant problem for the child

Behavioural Therapy

- Simple behavioural therapy (such as reward systems or waking a child to void in the toilet) may be effective for some
- Punishment and humiliation are to be avoided
- No meta-analysis exists, small trials cite fewer wet nights with reward systems and lifting
- The potential for negative consequences of such therapy has not been carefully studied
- It may be difficult to convince a child that a wet night is nothing to be ashamed of when dry nights are rewarded
- Lifting is labour intensive and may contribute to frustration and conflict

Behavioural Therapy

- The goal of treatment is to **reduce problems with frustration, conflict and poor self-esteem** - behavioural therapies for enuresis may do more harm than good
- Adverse outcomes of simple behavioural strategies for enuresis - family strife, emotional problems, and failure of the treatment because it was too demanding of the children or their families
- There is insufficient evidence to recommend routine use of behavioural therapy for primary nocturnal enuresis

Alarms

- The purpose of the enuresis alarm is to teach the child to respond to a full bladder while asleep
- The alarm goes off when the child starts to void. It may teach the child to wake up to the alarm and then, by approximation, transfer the waking to the sensation of a full bladder.
- The success of the alarm depends on the child being motivated
- The alarms are most effective in children >7-8yo

Alarms

- The miniature alarm systems are lightweight, portable, worn on the body and run on miniature batteries
- Options available in \$80 range (some much more expensive)



Alarms

- Initially, the child may continue to sleep deeply through the buzzer, requiring the parents to wake the child
- When awake the child should void in the washroom and assist in changing the bedding (non-punitive manner)
- Try for 3-4 months, use of the alarm system is continued until there have been 14 consecutive dry nights
- If relapse occurs a second trial of the alarm therapy can be used
- Actual cure rate of primary nocturnal enuresis using alarm devices is just under 50% (significantly lower than previously found)

Pharmacological Therapy

- **Desmopressin** is a **vasopressin analogue** that reduces the amount of urine produced at night (analogue to ADH)
- In a Cochrane Review of clinical trials, the use of desmopressin compared with placebo **desmopressin led to dryness in 20-30%**, and up to 40% of patients may have had a partial response
- Concluded that the use of desmopressin resulted in one to two fewer wet nights per week compared with placebo
- Risk of hyponatremia, other side effects - headache and abdominal pain
- Avoid consuming fluids for one hour before and eight hours after taking desmopressin

Desmopressin



- Desmopressin acetate's greatest value may be for short-term treatment, in settings such as camp or sleepovers, rather than as an attempt at a cure
- Tablet form (100 μg or 200 μg tablets), desmopressin acetate may be prescribed at doses from 200 μg to 600 μg
- Relapse rate is higher than the alarm
- Many of the guidelines suggest withdrawal of the medication every 3 months as a way to check and see whether the child still needs desmopressin

Pharmacological Therapy

- **Imipramine hydrochloride** is a **tricyclic antidepressant**, mode of action unclear
- Cochrane Review found that **20% of children will achieve dryness**
- Side effects include: personality changes, emotional lability, irritability and anxiety, disturbed sleep patterns, headaches and changes in appetite
- Serious side effects from overdose -convulsions, coma and arrhythmias
- Found to have a risk of QT prolongation in children, and a careful cardiac history for the child and the family should be obtained before starting

Imipramine



- The recommended starting dose is 25 mg for children 6-12yo and 50 mg for those >12yo
- The dose may be increased gradually to a maximum of 50 mg in children 6-12yo and 75 mg for >12yo
- The dose is given 1 h to 2 h before bedtime
- Medication should be tapered or withdrawn every 3 months to check for resolution
- Therapy for short-term treatment of nocturnal enuresis in distressed, older children if other treatments have been unsuccessful or are contraindicated, and if parents are judged to be reliable and are counselled about safe storage of the medication

Pharmacological Therapy

- Anticholinergics – not typically recommended
- Can cause constipation and worsen the issue

Supporting Families

- Listen to parents concerns, may seek medical opinion simply for reassurance
- Parents should be reassured about their child's physical and emotional health
- Validate how it is impacting the family
- Important to maintain the child's self-esteem and try to help minimize parental frustrations
- Need to communicate openly with both the child and parents

CPS Statement

Management of primary nocturnal

CPS Recommendations

- Clarify the goal of getting up at night and using the toilet
- Assure the child's access to the toilet
- Avoid caffeine-containing foods and excessive fluids before bedtime
- Have the child empty the bladder at bedtime
- Take the child out of diapers (training pants may be acceptable)
- Include the child in morning cleanup in a non-punitive manner
- Preserve the child's self-esteem

CPS Recommendations

- **Children for whom primary nocturnal enuresis is not distressing should not receive treatment.** Parents should be reassured about their child's physical and emotional health and should be counselled about eliminating guilt, shame and punishment (strength of recommendation – B, level of evidence – III)
- **A conditioning alarm system is the most efficacious therapy,** but it will be successful in the long term in less than 50% of children. Alarms may be the most appropriate initial line of therapy for primary nocturnal enuresis for older children in highly motivated families (strength of recommendation – A, level of evidence – I).

CPS Recommendations

- Pharmacological therapy with **desmopressin acetate** has a place in special situations, such as at camp and sleepovers, or when the alarm system is impractical or not effective (strength of recommendation – A, level of evidence – I). Special care should be made to avoid consuming fluids for one hour before and eight hours after taking desmopressin.
- In difficult circumstances, **imipramine hydrochloride** may be used cautiously but requires careful explanation to reliable parents about the danger of overdose.
- Treatment of primary nocturnal enuresis should be aimed at **minimizing the emotional impact on the child**. There is insufficient evidence about the good versus harm that behavioural therapies may exert in this regard. Reward systems and lifting should not be recommended without careful consideration of, and discussion with parents about, potential adverse effects (strength of recommendation – I).

Back to the Case

- Genetic component, sleep arousal difficulty and constipation
- Need to find out how it's impacting him, motivation to use the alarm system
- May consider Desmopressin for special events (200 μg)

Take-Home Points

- Primary nocturnal enuresis is common and most children will outgrow the condition spontaneously, it is a variation in the development of normal bladder control
- The psychological effect to the child can be significant and represents the main reason for treatment of these children
- Important to differentiate primary from secondary enuresis
- Enuresis should only be treated with pharmacotherapy and/ or alarms in cases where it poses a significant problem for the child
- Parents should be reassured about their child's physical and emotional health and should be counselled about eliminating guilt, shame and punishment

References

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Thanks!



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January 15, 2015



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