PEDS: NOCTURNAL ENURESIS IN CHILDREN

Background

1. Definition: urinary incontinence or bed-wetting at night (more than twice a week) in children >5 y/o
2. General Information
    - Monosymptomatic: uncomplicated – does NOT include other Lower Urinary Tract Symptoms (LUTS)
        - Primary: consistent night-time dryness has never occurred
        - Secondary: symptoms occur after previously achieving period of night-time dryness (of at least 6 months)
    - Non-Monosymptomatic: complicated - includes other LUTS or other co-morbidities (eg, diabetes, spina bifida, seizure disorder, other)

Pathophysiology

1. Physiology[1]
    - Possible low AVP (arginine vasopressin) secretion with resultant increased urine production
    - Smaller functional bladder capacity
    - Deep sleep with diminished arousal capacity
    - Detrusor instability[2]
    - Psychosocial stressors
    - Genetics - linkage to chromosome 8q, 12q, 13q, 22q11[1,2]
2. Incidence, Prevalence
    - Monosymptomatic makes up 85% of cases
    - Age 5 – 7% of boys, 3% of girls
    - Age 10 – 3% of boys, 2% of girls
3. Risk Factors
    - 2:1 ratio, boys to girls
    - Genetics - strong familial component[2]
        - 44% of kids with one positive parental FHx (family history), 77% with both parents positive FHx
        - Twin concordance - 68% of monozygotic, 36% dizygotic
    - Maturational delay
    - Lower socioeconomic groups
    - Larger families
    - Institutionalized children
4. Morbidity / Mortality
    - Mainly psychological morbidity
    - 1% remain enuretic until adulthood

Diagnostics

1. History
    - Onset, duration, severity
    - Fluid intake habits
    - Voiding habits

- Voiding symptoms (dysuria, frequency, urgency, nocturia, wetting/incontinence)
- Bowel habits and frequency
- ROS to include constitutional (fatigue, weight loss), snoring, polydipsia
- Past medical history
- Family history of enuresis

2. Physical Examination
   - Constitutional
   - Ear, Nose and Throat – assess tonsils and adenoids
   - Abdominal exam – assess for distended bladder, enlarged kidneys or fecal masses
   - Genitourinary exam - inspect urethra for discharge, perineum for irritation or signs of trauma, anus for signs of pinworm
   - Neurologic – gait, tone, strength, reflexes, evaluate perineal sensation and rectal tone
3. Diagnostic Testing – point of care
   - Urinalysis
   - Urine culture
4. Further Diagnostic Testing - rarely needed - reserved for complicated cases.[2]
   - Laboratory evaluation
     - Basic metabolic profile to include kidney function and glucose
     - Thyroid Stimulating Hormone
   - Diagnostic imaging
     - Renal ultrasound
     - VCUG (voiding cystourethrogram)
     - Lumbsacral MRI
   - Other studies
     - Urodynamics

Differential Diagnosis[2]

1. Key Differential Diagnoses
   - Bladder Dysfunction
   - Urinary tract infection
   - Constipation/Obstipation/Encopresis
2. Extensive Differential Diagnoses
   - Obstructive Sleep Apnea
   - Psychological Stress
   - Pinworm Infection
   - Diabetes Mellitus
   - Hyperthyroidism
   - Chronic Renal Failure
   - Diabetes Insipidus
   - Seizure disorder
   - Sickle cell disease

Therapeutics

1. Acute Treatment: not indicated in absence of co-morbidities
2. Long-Term Care [2, 3]
    - Hold treatment until after 7 y/o unless significant distress about symptoms or negative affect on self-esteem – (SOR:B).[4]
    - Record voiding patterns and volumes, rule out daytime symptoms.[4]
    - Reassurance with elimination of guilt, shame and specifically punishment. Minimize emotional impact. Avoid rewards for dry nights. – (SOR:C).[4]
    - Behavioral plan – avoid caffeine and excessive fluids before bedtime; void before bed; include the child in morning clean-up (non-punitively); preserve self-esteem.[4]
    - Enuresis alarm reduces wet nights by almost 4 per week (NNT 2)[5] – (SOR:A).
    - Dry-bed training (awakening child at night to void) and bladder training alone are not recommended – (SOR:B).[2]
    - Dry-bed training can be used in combination with alarms for improved number of dry nights – (SOR:A).[5]
    - Second line treatment with tricyclics (imipramine and desipramine) not recommended due to side effects [3]. They do reduce wet nights by 1-2 per weeks during treatment (NNT 6) – (SOR:A).[5]
    - Second line treatment with anticholinergics in children with urgency – (SOR:B).
    - ddAVP most effective with normal bladder capacity only while treatment continues (NNT 7) – (SOR:A).
    - ddAVP safe to use long term with occasional attempts to wean – (SOR:B).[6]
    - Alternative treatments including acupuncture, chiropractic or spinal manipulative, reflexology or natural supplements – all Grade C (unclear or conflicting scientific evidence).[7]

Follow-Up

1. Return to Office
    - Acutely with treatment initiation or yearly if following.
    - New or worsening symptoms
2. Refer to Specialist
    - Indicated if refractory to treatment
3. Admit to Hospital
    - Not indicated unless there are co-morbidities

Prognosis - Spontaneous resolution occurs in about 15% per year[2,5]

Prevention – none.

Patient Education

1. http://familydoctor.org/online/famdocen/home/children/parents/toilet/366.html
2. http://www.mayoclinic.com/health/bed-wetting/DS00611

References

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[3] Makari J, Rushton HG. Nocturnal Enuresis. *Am Fam Physician.* 2006 May 1;73(9):1611-1614. http://www.aafp.org/afp/2006/0501/p1611.html

[4] Community Paediatrics Committee, Canadian Paediatric Society. Management of primary nocturnal enuresis. *Paediatr Child Health* 2005;10(10):611-14 www.cps.ca/english/statements/CP/cp05-02.htm

[5] Lyon C, Schnall J. What is the best treatment for nocturnal enuresis in children? *Journal of Family Practice.* 2005 October 54;10: 905-909 www.jfponline.com

[6] Diehr S, Scoville C. How effective is desmopressin for primary nocturnal enuresis? *Journal of Family Practice.* 2003 July 52;7: 568-569 www.jfponline.com

[7] Natural Standard – The Authority on Integrative Medicine. http://naturalstandard.com/databases/effectiveness/ex/nslinkcondition.asp?title=Nocturnal%20enuresis

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