

Bedwetting/Enuresis: -a 15 minute consultation

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Epidemiology:

Children usually achieve daytime dryness (continence) by about three years of age, and night by 5 years. Involuntary wetting during sleep without any inherent suggestion of frequency of bedwetting or pathophysiology after age 5 is defined as Nocturnal Enuresis^[1].

21% of children wet by 4 or 5 years of age with infrequent wetting (less than 3 times a week) and 8% for frequent wetting (more than 3 times a week). By 9 ½ years of age, this reduces to 8% and 1.5% respectively^[1]. Around 2% of pubertal children and adolescents are still bedwetting which can progress into adulthood. Though enuresis is considered to be a benign entity in the community, a persistence beyond 7 years of age can lead to social dysfunctions and negative impact on children's emotional and psychological development^[2].

The Aetiology and Pathogenesis:

Bedwetting is broadly classified into primary Enuresis and secondary Enuresis.

Primary Enuresis is defined as incontinence never achieved in life and is usually due to a delayed brain- bladder coordination or a lack of nocturnal vasopressin surge, it can rarely occur as a result of neurodevelopmental /Urological problems.

Secondary Enuresis is defined as a relapse after achieving a period of being dry for more than 6 months.

This can happen after a stressful event such as bereavement or new arrival of a sibling. It can be caused due to kidney or bladder events such as UTI, voiding dysfunction, neuropathic/ neurological, and urological causes.

Enuresis is considered Monosymptomatic if there are no day time symptoms and Polysymptomatic if the child wets themselves day and night.

Management: History-

A thorough history leads towards a diagnosis in majority of incontinence cases. Hence a detailed history around the birth and development, toilet training habits, and family and social history is important.

Incontinence History should include previous history of continence, the time and frequency of wetting (number of wet episodes / week, early morning or multiple times throughout the night), The amount of wetting (discrete/ large), and whether the child wakes up during bedwetting.

The history should further include questions around Bladder habit during the day time, any history of incontinence, urinary stream, dysuria and any history of previous urinary retention.

A loaded rectum i.e. constipation can trigger nocturnal detrusor over activity and hence enuresis^[3], therefore frequency of bowel

movement and any faecal incontinence must be questioned about.

30% of children inherit this condition from a parent hence the family history is important. The exact mechanism is not well understood. A locus at chromosome 13q has been identified. The inheritance pattern has been found to be autosome dominant (43%) as well as autosomal recessive (9%)^[4].

History around social setting is also necessary including the schooling as Enuresis can present after stressful events for example, bullying or being alienated. Families with high expecting parents have been found to have more incidence of their enuresis.

Physical examination-

The physical examination revolves around ruling out secondary causes i.e. neurogenic or urological abnormalities. This should include a detailed systemic and an external genital assessment. A sore vulva vaginal area leads towards recurrent vulvo-vaginitis. Any presences of STD leads towards a possibility of sexual abuse.

Boys after 5 years of age with constant wetting should be ruled out for urological abnormalities, girls with constant dampening should be ruled out for ectopic ureter.

Diagnosis and management:

The management has traditionally been adopted around a 3 system approach although the current NICE guidelines does not discuss about this.

The approach trails along the following 3 main elements:

- 1) Overactive bladder or small functional bladder capacity
- 2) Nocturnal polyuria
- 3) Lack of arousal

Overactive bladder/ small functional capacity usually presents with night and day time symptoms with increased frequency of micturition, urgency, and urinary leaks of varying patches. This can happen due to hypertonicity or hyperreflexia of the detrusor muscles causing a low filling bladder capacity.

Nocturnal polyuria usually presents due to low levels of nocturnal vasopressin and the child continues to produce urine recurrently at night, sometimes shortly after going to bed.

Lack of arousal occurs in a child when they fail to respond to full bladder signals towards the brain. These children usually wet the bed around early morning, usually after 2 am. Often children are a heavy sleeper and sleep through the wetting episode.

Investigations-

A urine dipstick is useful if there are symptoms suggesting a

UTI, if the child is ill and a recent onset of enuresis^[1]. Investigation should be initiated if any symptoms suggesting diabetes mellitus (DM) or insipidus (DA) such as polyuria and excessive drinking, loss of weight or ill health. An early morning serum/ urine osmolality in paired samples are useful to rule out DA.

Pre/ post void ultrasound of kidney and bladder may be needed to rule out any structural abnormality or to assess the bladder capacity.

In a minority of cases, an uroflometry is needed to assess the bladder function and emptying.

Very rarely, an MRI of spine may be indicated, especially if the child has got any signs of spinal dysraphism, any neurological weaknesses or faecal incontinence.

Initial management-

It mainly revolves around behaviour modification achieved through rewarding the child for maintaining a good liquid intake, bladder and bowel habit, an involvement in linen management. An adequate liquid intake commonly more than 6-8 glasses a day, maintaining hygiene with regular showers/ bath is recommended.

Initial management is by the community Enuresis nursing team. A child comes to medical attention when they fail to respond to the primary measures.

The medical management-

The medical management varies according to the 3 system entities.

A child with lack of arousal is usually considered to be a delayed brain- bladder coordination and respond well to an Enuresis alarm. This is a water sensitive alarm supposed to trigger once the child is wet and thus reconditions there sleep. It comes in mattress or knicker warn alarm and also recently wireless alarms are available.

The alarm is contraindicated if the parent/ child are unable to cope, room shared with a sibling, infrequent wetting or disruption to family life^[1].

Nocturnal polyuria is managed with external vasopressin (Desmopresin). The dose starts at 200 microgram (Desmotab) or 120 microgram (Desmomelt) respectively to be taken at bedtime. The child is advised to stop drinking 1-2 hours before bed time and attend to the toilet just before going to bed.

Desmopressin also improves the neuropsychological function and the sleep pattern^[5].

The side effects may include hyponatremia due to fluid retention, hence the child is advised not to drink at night and not drink excessively in the day time.

A child with an overactive bladder/ small functional bladder needs anticholinergics i.e oxybutynin or imipramine. This works by relaxing the bladder muscles hence increasing the capacity as well as the hyperreflexive attitude of the detrusor muscles.

The dose for oxybutynin starts from 2.5 milligram twice a day and can be increased up to 5 milligram 3 times a day. Common side effects include headache, dryness of mouth and occasional dizziness.

Imipramine is a second line therapy due to its cardiotoxicity. Clinicians need to discuss the benefits and the side effects of the medicine.

NICE advises to assess children for a week after every 3 months if they have achieved a full remission or not. The medicine needs to be resumed if they are still bedwetting more than 3 times a week. In practice, this can sometimes be difficult if not achieved a full remission, as a relapse can work adversely on the child's

confidence, thus further administration of medication may not be as helpful as before.

If the child has no improvements by 4 weeks of treatment, it indicates a management approach reassessment either increasing the dose of medicine, combining the therapies (Desmopressin and alarm), or switching to a second line therapy.

In children presenting with combined polysymptomatic enuresis (day and night time symptoms), a combination of treatment may be useful in addition to reward charts.

Psychological support is needed for parents, and mothers especially, for a more functional stress management related to the PMNE^[6,7].

The prognosis varies and depends on factors such as parental cooperation. It can often be limited in a child with neurodevelopmental issues, dysfunctional families, or any secondary issues not addressed timely.

The treatment outcomes are as follows:

Initial success -responds for more than 14 consecutive dry nights/ days or more than 90% reduction.

Partial response- less than 14 consecutive dry period, less than 90% reduction.

Long term success-

Completes success- no relapse in 2 years after ending the treatment.

Continued success- no relapse in 6 months after finishing the treatment.

Relapse- more than 1 symptoms recurrence per month.

Reference:

1. NICE. Bedwetting in under 19s. NICE Guidelines. 2010. <https://www.nice.org.uk/guidance/cg111>.
2. Butler RJ, Heron J. The prevalence of infrequent bedwetting and nocturnal enuresis in childhood: A large British cohort. *Scandinavian Journal of Urology and Nephrology*. 2008; 42; 257-64.
3. Arnell H, Hjalmas K, Jagervall M, Lackgren G, Stenberg A, Bengtsson B, Wassen C, Emahazion T, Anneren G, Pettersson U, Sundvall M, Dahl N. The genetics of primary nocturnal enuresis: inheritance and suggestion of a second major gene on chromosome 12q. *J Med Genet*. 1997; 34 ; 360-5.
4. Nevés T. Pathogenesis of enuresis: Towards a new understanding. *Int Journal of Urol*. 2017; 24; 174-82.
5. Herzele CV, Dhondt K, Roels SP, Raes A, Hoebeke P, Groen LA, Walle JV. Desmopressin (melt) therapy in children with monosymptomatic nocturnal enuresis and nocturnal polyuria results in improved neuropsychological functioning and sleep. *Pediatric Nephrology*. 2016; 31;1477-84
6. Roccella M, Smirni D, Smirni P, Precenzano F, Operto FF, Lanzara V, Quatrosi G, Carote m. Parental Stress and Parental Ratings of Behavioural Problems of Enuretic Children. *Front Neurol*. 2019; 10; 1-10.
7. Collis D, Kennedy-Behr A, Kearney L. The impact of bowel and bladder problems on children's quality of life and their parents: a scoping review. *Child Care Health Dev*. 2019; 45; 1-14 .

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