



Nocturnal Enuresis

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Uncontrolled leakage of urine at an inappropriate time and place after 5 years of age is known as incontinence.

Primary Nocturnal enuresis (NE) is enuresis in a child who has previously been dry for less than 6 months. Secondary enuresis is enuresis in a child who has previously been dry for at least 6 months. Monosymptomatic enuresis is enuresis in a child without any (other) lower urinary tract symptoms. Non-monosymptomatic enuresis is enuresis in a child with (other) lower urinary tract symptoms, such as daytime urgency, frequency, holding manoeuvres. Prevalence of Nocturnal enuresis is 15% in 5-year-old, 7% in 7-year-old, 5% in 9-year-old, 2% in 15-year-old. Fewer than 1/3rd of the parents of a bedwetting child consults a doctor.

IMPACT OF PRIMARY NOCTURNAL ENURESIS

- **Psychological well-being:** It results in substantial feeling of shame, anger and inferiority, dangerous impairment of self-esteem, inability to socialize impacting outdoor activities and fear of public discovery haunts sufferers.
- **Parental Concern:** NE imparts an emotional impact on child and effects the child's social relationships leading the parents to think if their child is normal. Parental concern also includes removing the smell from the bedroom, keeping it a secret and the extra washing,

A family history of bedwetting strongly predicts bedwetting in children. As per literature, 73% of children affected by bedwetting have first degree relatives with a history of bedwetting, the age of attaining dryness is delayed by 1.5 years if both parents have a history of bedwetting, risk of bedwetting is 5-7 times higher if one parent has a history of bedwetting and 11.3 times higher if both parents are affected. The gene responsible is ENURI 1 gene (AD) and chromosomes 8, 12, 13.

KEY PATHOGENIC MECHANISMS UNDERLYING NOCTURNAL ENURESIS

Nocturnal Polyuria

- Nocturnal urine production > 130% of expected bladder capacity (EBC) for age (normally decreases to 50% of daytime) +/- Reduced or abnormal bladder reservoir function at night.

Bladder Function Problems

- Functional bladder capacity (FBC) is vital for NE, Bladder capacity: {Age (in years) + 2} x 30 ml, in enuretics, nighttime BC is lower, but in non enuretics: 1.6 - 2 times larger than day time BC. There can be detrusor over activity in absence of Lower urinary tract symptoms. Constipation and urinary tract infections can cause detrusor over activity.

CONSERVATIVE MANAGEMENT

- Timed voiding - voiding every 3-4 hours (discourage holding), Voiding immediately upon rising in morning and before bed, Adequate hydration, Distribute fluid intake (40% morning, 40% afternoon, 20% evening).
- Treat constipation, Proper positioning on the toilet seat, encourage child to take time on toilet to empty completely, Encourage physical activity - discourage TV / Computer for long duration, motivational therapy like Star charts should be started.
- Alarm Therapy: 60-70% Effective but labour extensive, Moisture sensor and alarm which rings when child wets, Conditioning - teaches child to wake to a full bladder before wetting, May be used in combination with DDAPV and/or oxybutynin, 30-40% subjects discontinue therapy.
- Dry Bed training: Waking the child on a schedule of decreasing intervals over several nights, The child is made to change clothes and bedding (if wet), and walk to the toilet if voiding is required.
- Motivational Therapy: Combination of providing reassurance, emotional support, eliminating guilt, and rewarding the child for dry nights, Cleaning after bedwetting should not be performed as a punishment, avoidance of dairy products, fruits



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juices, and fluids 2 hours before bedtime, voiding just before bed.

PHARMACOLOGICAL THERAPY OF ENURESIS: OXYBUTININ AND TOLTERODINE

- Primarily to treat children with daytime urgency or frequency as well as night-time enuresis, Small capacity bladder when Neurogenic component is ruled out, Children with PMNE only where primary treatment has failed, Act mainly by suppressing detrusor over activity.
- Side effects include flushing, blurred vision, constipation, tremor, decreased salivation and decreased ability to sweat.
- WHO & NICE has now endorsed that Imipramine cannot be recommended for treatment of PNE.
- Desmopressin: Pharmacologic therapies for nocturnal enuresis decrease the frequency of enuresis and temporarily resolve symptoms until spontaneous resolution occurs, the response rate to desmopressin therapy is 60%–70%, but relapse rates are high. The NE indication has been withdrawn from the

intranasal spray in most countries due to unpredictability of dosing and increased risk of hyponatremia. The combination of an enuresis alarm with desmopressin may be superior to the use of desmopressin alone. Children with Nocturnal Polyuria are most likely to benefit from desmopressin since lower nocturnal vasopressin levels have been demonstrated in a large percentage of patients, making substitution with desmopressin, a rational first-line treatment for children with MNE and NP.

One must rule out the following before starting enuresis treatment: Constipation/Encopresis, Recurrent UTI's: Reflux disorders, Abnormal urine analysis, Sleep disorders : OSA , Underlying DM / DI, Neuropsychiatric conditions like ADHD & Learning disabilities, Spinal dysraphism / lower limb weakness / patulous anus, Failure to thrive : Renal tubular acidosis, Bony deformities due to CKD / RTA, Deranged RFT, USG KUB and Hypertension.

Cite this article as:

Mangla A. Nocturnal Enuresis. Int Healthc Res J. 2021;4(12):GC1-GC2.
<https://doi.org/10.26440/IHRJ/0412.03402>

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