Desmopressin for Nocturnal Enuresis in Children

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DETAILS FOR THIS REVIEW

Study Population: 8,473 children, mostly between 5 and 16 years of age, with nocturnal enuresis (no known organic cause) from 95 randomized or quasi-randomized studies; 5,434 children received desmopressin

Efficacy End Points: Average number of dry nights per week achieved during therapy; 14 consecutive dry nights achieved during therapy

Harm End Points: Adverse events (eg, headache, stomach cramps, dry mouth)

Narrative: By 5 years of age, most children are physiologically capable of sleeping through the night without involuntary loss of urine.[1] However, up to 20% of children who are 5 years of age experience nocturnal urinary incontinence (ie, nocturnal enuresis or enuresis).[2] Although enuresis prevalence in children decreases by 15% per year as a child ages through adolescence, persistent symptoms can feel stigmatizing and diminish patient and caregiver quality of life.[1]

Desmopressin is a vasopressin analogue that promotes free water resorption in the kidneys, reducing urine accumulation in the bladder to a level that can be accommodated overnight.[1] Historically, desmopressin was administered intranasally, but oral formulations are now recommended for their superior reliability, tolerability, and safety.[3]

The 2025 Cochrane review described here included 95 randomized and quasi-randomized studies across 29 countries in primarily outpatient settings that compared desmopressin with various treatments, including placebo, enuresis alarm therapy, anticholinergics (eg, oxybutynin), and combination therapies.

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THE NUMBERS

Benefits of Desmopressin for Nocturnal Enuresis in Children

Desmopressin vs placebo or no active treatment

1 in 5 achieved 14 consecutive dry nights with desmopressin; use may result in 1.81 fewer wet nights on average per week

Desmopressin plus alarm vs alarm only

Combination therapy may result in 0.80 fewer wet nights on average per week

Desmopressin plus alarm vs desmopressin only

1 in 10 achieved 14 consecutive dry nights with combination therapy; combination therapy may result in 0.88 fewer wet nights on average per week

Desmopressin plus anticholinergics vs desmopressin alone

1 in 6 achieved 14 consecutive dry nights with combination therapy

Harms

Insufficient data

The Cochrane review included a total of 8,473 participants, of whom 5,434 received desmopressin.[4]

At varied nightly doses (200, 400, and 600 mcg), desmopressin therapy appeared to produce 1.81 fewer wet nights on average per week compared with placebo (16 randomized controlled trials [RCTs]; n = 1,267; low-certainty evidence). Moderate-certainty evidence showed that desmopressin also probably increases the number of children achieving 14 consecutive dry nights compared with placebo (risk ratio [RR] = 3.18;

The NNT Group Rating System

Green	Benefits greater than harms
Yellow	Unclear benefits
Red	No benefits
Black	Harms greater than benefits

95% CI, 1.75-5.80; absolute risk difference [ARD] = 2.2%; number needed to treat [NNT] = 5; 11 RCTs; n = 922). There was no apparent difference in adverse events between the two groups.

Very low-certainty evidence showed that desmopressin plus alarm therapy may produce 0.80 fewer wet nights on average per week compared with alarm therapy alone (six RCTs; n = 528), although there was no apparent difference in adverse events or achieving 14 consecutive dry nights.

Desmopressin plus alarm therapy produced 0.88 fewer wet nights on average per week compared with desmopressin alone (two RCTs; n = 156; moderate-certainty evidence) and probably increases the number of children achieving 14 consecutive dry nights vs desmopressin alone (RR = 1.26; 95% CI, 1.06-1.51; ARD = 11%; NNT = 10; five RCTs; n = 370; low-certainty evidence). No adverse events were reported for this comparison.

Low-certainty evidence demonstrated that desmopressin plus anticholinergics may increase the number of children achieving 14 consecutive dry nights vs desmopressin alone (RR = 1.53; 95% CI, 1.10-2.11; ARD = 19.9%; NNT = 6; eight RCTs; n = 611), with no apparent difference in wet nights or adverse events.

Across all studies, adverse events were reported in approximately 27% of those who received desmopressin and included gastrointestinal discomfort, dizziness, headaches, nasal discomfort (with nasal desmopressin administration), mood changes, and one report of convulsions.

Caveats: Although the data presented from this systematic review were synthesized from several higher quality studies, much of the available data demonstrated uncertain outcomes due to small sample sizes (n < 50) in 30 of the trials; high or unclear risk of bias from incomplete information on randomization methods, allocation concealment, or blinding; and lack of adequate sequence generation in most trials.

Additionally, no distinctions were made between age subgroups (eg, 5-11 vs 12-16 years of age). Older children presumably respond more reliably to therapies such as enuresis alarms, and subgroup analysis would be desirable in future studies.

The data favor alarm and desmopressin combination therapy over either therapy alone in several metrics. However, enuresis alarm therapy relies on awakenings in response to being wet to train the patient. Pharmacologic reduction of wet nights with the addition of desmopressin is theoretically contrary to this behavioral goal because it reduces the opportunity for association building. The treatment duration necessary to achieve 14 consecutive dry nights was not reported in this review, which further limits informed decision-making. Additional high-quality studies on combination alarm and desmopressin therapy vs monotherapy are warranted to determine significance.

Reports of adverse events such as headaches and stomachaches were common, but the severity and duration of these harms were not often documented. Improvement in quality of life from nighttime continence is the primary patient-centered goal of treatment, and studies that focus on the overall or net patient satisfaction from treatment would provide a more compelling benchmark for treatment success.

Furthermore, access and feasibility of implementing enuresis therapy deserve discussion. A family with financial constraints with access to prescription benefits may prefer pharmacologic therapy more than alarm therapy from a cost standpoint.

Several expert society guidelines, such as the International Children's Continence Society, the American Academy of Pediatrics, and the National Clinical Guideline Centre, recommend desmopressin as a treatment option for nocturnal enuresis.[1,2,5]

Conclusion: Given the effectiveness and safety profiles, we have assigned a color recommendation of green (benefits greater than harms) for the use of desmopressin in children with nocturnal enuresis. Desmopressin may be beneficial in reducing the mean number of wet nights and helps individuals achieve 14 consecutive dry nights compared with placebo, with fewer prevalent harms than its pharmacologic comparators. Because of similar effectiveness between alarm therapy and desmopressin, treatment should be tailored to the individual's goals and situation, particularly when considering ease of implementation. Further high-quality studies are needed to provide greater certainty and to assess the effect of these therapies on patient-centric qualitative measures.

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