

Review: alarm interventions reduce nocturnal enuresis in children

Glazener CMA, Evans JHC. *Alarm interventions for nocturnal enuresis in children*. *Cochrane Database Syst Rev* 2001;(1):CD002911 (latest version 24 Nov 2000).

QUESTIONS: Do alarm interventions reduce nocturnal enuresis (bed wetting) in children? Are alarm interventions more effective than other interventions?

Data sources

Studies were identified by searching AMED (alternative medicine), ASSIA (Applied Social Science Index and Abstracts), BIDS, BIOSIS Previews (1985–96), CINAHL, DHSS Data, EMBASE/Excerpta Medica (1974–97), Medline (1966–97), PsycLIT, and SIGLE; bibliographies of relevant studies and reviews; and by contacting key organisations, manufacturers of enuresis products, researchers, physicians, psychologists, and other health professionals.

Study selection

Randomised or quasi-randomised controlled trials in any language were selected if they compared an alarm intervention with an appropriate control group for the treatment of non-organic nocturnal enuresis and systematically measured baseline levels of bed wetting.

Data extraction

Data were extracted on methods, inclusion criteria, participant characteristics including baseline bedwetting levels, dropouts, type of intervention, length of follow up, and outcomes. Assessment of trial quality considered allocation concealment, comparability of groups at baseline, use of a washout period in crossover designs, intention to treat analysis, clear definition of outcomes, blinding, follow up, and appropriate statistical analyses. Where possible, data were converted to the mean and standard deviation of the number of wet nights per week. Main outcomes were treatment failure (number not achieving 14 consecutive dry nights) and treatment failure or relapse (number not achieving 14 consecutive dry nights or relapsing after achieving that criterion).

Main results

22 randomised trials (n = 1125) met the inclusion criteria. Study quality was generally poor and most comparisons involved data from only 1 study. Average sample size was 51. Meta-analysis of 5 trials (n = 177) (using a fixed effects model) found that children who used alarms were less likely to have treatment failures than children who had no treatment or were on a waiting list (table). Results still favoured alarms when considering children with an outcome of treatment failure or relapse (table). Insufficient evidence exists in the other trials that compared different types of alarms, alarms with behavioural treatment, alarms alone with

alarms augmented with other interventions, or alarms with medications.

Conclusions

Alarm interventions compared with no treatment reduce nocturnal enuresis in children. Insufficient evidence exists about which type of alarm is best, or about the efficacy of alarms compared with behavioural interventions, medications, or augmentation of alarms with other interventions.

COMMENTARY

Primary nocturnal enuresis continues to challenge millions of children and their parents each year. Despite continuing efforts to understand the aetiology of this frustrating, common childhood problem, little is known. What is known is that each year nearly 15% of children with nocturnal enuresis will “outgrow” this problem, so that eventually all but 2–3% of children become dry at night.¹ In this process, however, too many children experience shame and ridicule, further compromising their social and emotional development. Over the years several interventions have been tried, ranging from home remedies to behavioural techniques to medications. One of the most traditional approaches is the use of special alarms that ring when a child wets, awakening the child and conditioning him to self awaken when his bladder is full. Historically viewed by healthcare providers as the most effective intervention, the dominance of alarms has recently been challenged by desmopressin—now marketed as a quick fix for bed wetting.

The review by Glazener and Evans systematically examines what is known about the effectiveness of alarm interventions and compares them with other interventions. Most studies failed the rigour of scientific scrutiny. Nevertheless, analysis of the findings of 22 randomised trials evaluating 1125 children with enuresis confirms clinicians’ assumptions that alarms do work in reducing night wetting. Most importantly, treatment effects hold true even after treatment finishes. Although definitive conclusions about the superiority of alarms over medications during a treatment episode are uncertain, the findings of Glazener and Evans lend credence to the popular understanding that relapse rates are higher after treatment with desmopressin or tricyclics than with alarms. Further study is needed to support early evidence that initiation of desmopressin combined with an alarm may hasten response in clinical situations that require a quick solution. Important questions remain about how best to approach families who appear unable to tolerate lengthy treatment regimens; but when a safe and effective intervention is sought in the treatment of bed wetting, there is clear evidence that alarm interventions make sense.

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1 Forsythe WI, Redmond A. Enuresis and spontaneous cure rate. A study of 1129 enuretics. *Arch Dis Child* 1974;**49**:259–63.

Source of funding:
 National Health Service
 Research and
 Development Programme
 UK.

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Alarm v control for nocturnal enuresis in children*

Outcomes	Weighted event rates			
	Alarm	Control	RRR (95% CI)	NNT (CI)
Treatment failure during treatment	26%	96%	73% (61 to 81)	2 (2 to 2)
Treatment failure or relapse after treatment completion	57%	98%	42% (26 to 54)	3 (2 to 4)

*Abbreviations defined in glossary; RRR, NNT, and CI calculated from data in article.