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WHAT HAPPENS TO CHILDREN WHO HAD BLADDER VOLUME TRAINING FOR REFRACTORY BEDWETTING WHEN THEY GROW UP

Hypothesis / aims of study

Bedwetting is amongst the most prevalent problems in childhood. Current treatment models generate a three system approach: desmopressin for a deficient diuresis pattern, bladder training and anticholinergic drugs for detrusor overactivity and the enuresis alarm to drill the child to wake in response to wetting himself. We present results in children with refractory monosymptomatic primary nocturnal enuresis (NE) treated with bladder volume training. We evaluate the importance of normalisation of the bladder capacity and show the longterm results when such children grow into adolescence and adulthood.

Study design, materials and methods

We included 35 children, 12 girls and 23 boys between 14 and 25 years old who had been treated for NE minimum 5 years ago. No one had daytime incontinence, history of urinary tract infections, urologic or neurologic disease, voiding dysfunction. Nocturnal polyuria was excluded by evaluating nocturnal excretion of solutes and free water.
During the original training all had urodynamic testing in the beginning and at the end of the training period. The basic training had been volume training and anticholinergics. When NE persisted despite a bladder capacity of 80% of age expected capacity an enuresis alarm was added to the treatment. Frequency-volume charts were filled in at start and at the end of the training.
The actual evaluation consisted of a telephone contact with filling in of the first part of a questionnaire. Supplementary questions and frequency volume charts were sent by mail if participation was agreed. All voided volumes were measured during two days with the fluid intake, the reason to void (sensation or other, 1). Capacity expected for age was calculated by the formula of Hjalmas (2).

Results

At the time of primary treatment the participants were mean 9,3 years old (6-15years old). Twenty seven had detrusor overactivity.
Maximum cystometric capacity changed from 58,5% (33 -74%) to mean 119% (69 – 152%) of the expected capacity for age. Maximum voided volumes noted in the diary changed from mean 47% (29 -74%) to mean 120 % (69 – 152%) from age expected capacity. Thirty achieved the age expected capacity. Bedwetting decreased in all and such from mean 6,3 (2-7) per week to mean 3.6 (1/ 2 weeks to 6 / week). No child was completely dry at that stage. Twenty eight used an enuresis alarm for a mean of 4 months. Bedwetting decreased to mean 0,4 per week (1/ 4 weeks to 2/ week). At the end of the treatment 24 were dry. But only 11 were able to sleep through the night (8 dry, 3 occasionally bedwetting). The other woke at night from desire to void (16 dry, 8 bedwetting).
The contact by telephone was mean 7,7 years (5-10 years) after the original training stopped. Participants were then mean 17,1 years old. Twenty eight were now dry, 5 reported bedwetting twice a month and two others 2-4 times a year. Eighteen were able to sleep through the night, 17 woke up spontaneously. Five refused to fill in diary charts, fearing to relapse, unwilling to be remembered an unpleasant period. Five agreed to participate but filled in too incomplete. The other 25 filled in maximum volumes voided of mean 100% (57 – 211 %) of age expected capacity. The average voided volumes were mean 55 % (29% to 127%) of expected capacity. Fluid intake was mean 1659 ml (990 – 2300 ml).

Interpretation of results

Capacity training combined with anticholinergics was able to increase bladder capacity in 86% of these children with urodynamically proven detrusor overactivity, too small bladder capacity and persistent bedwetting. However, though most children improved, none became completely dry. With additional bedwetting alarm in those with normalised capacity, 69% became dry. Half of these cured children woke to void at night.

When reaching adolescence or young adulthood only 36% had normal capacity and again half stood up at night to void. From those with too small capacity 75 % were dry but most woke up at night.

Concluding messages

1. The prevalence of adulthood NE may be higher than written in literature if groups with detrusor overactivity, small bladder capacity are studied.
2. Bladder capacity training and anticholinergics can increase bladder capacity but do not lead to cure of the bedwetting in most
3. Children with normal bladder capacity and NE can greatly benefit from bedwetting alarm
4. Stopping of the bedwetting corresponds with spontaneous awakening at night to void
5. Even when normal capacity is reached with training many will fall back in capacity during the yers following training. This does not correspond with relapse of bedwetting.
6. These data have to be controlled in a larger population.

References

1. Neurourol Urodyn 2003; 22: 638-642.
2. Scan J Urol Nephrol 1988; 114: 20-27.