

## THE INFLUENCE OF AGE, MOTIVATION AND PELVIC FLOOR MUSCLE EXERCISES ON THE FULL-SPECTRUM THERAPY FOR NOCTURNAL ENURESIS: A RANDOMIZED CONTROLLED STUDY

### Hypothesis / aims of study

Pelvic floor exercises were mentioned as treatment for nocturnal enuresis with a 16% higher success rate than spontaneous cure rate and as treatment to increase bladder capacity [1].

The aim of this study is to investigate the role of pelvic floor muscle exercises on the short term success and duration of full spectrum therapy and on the enlargement of the bladder capacity. A second aim is to find predictive factors for success.

### Study design, materials and methods

Sixty-three consecutive children were referred for full-spectrum therapy to try to solve their nocturnal enuresis problem. Children with organic dysfunctions of bladder and kidneys were excluded from the study. Full spectrum therapy includes the use of an enuresis alarm, motivational therapy by giving a reward when the child woke up during the night and a bladder diary with fixed drinking and voiding times. When the child has reached 14 consecutive dry nights, the therapy was considered successful. An extra training was added called over-learning. Over-learning means that the child had to drink one glass each time before he went to bed. When he had reached 7 consecutive dry nights, he had to drink 2 glasses until he achieved again 7 consecutive dry nights, then the therapy is ended. Maximum duration of treatment was 6 months. The 63 children were randomly assigned to either an experimental group (full spectrum therapy including pelvic floor muscle exercises) and a control group (full spectrum therapy without pelvic floor muscle exercises). Before randomisation, stratification was based on age. During the weekly sessions, the results of the diary with the evolution at night, drink- and voiding chart were discussed. The largest voided volume was compared with the expected bladder capacity and the enlargement during treatment was evaluated. The pelvic floor muscles exercises consisted of 20 contractions (10 of 1 second and 10 of 10 seconds). They were repeated in every session with the children of the experimental group and daily at home. The Kaplan-Meier method was used to estimate the time needed to achieve success. The log rank test was used to describe if there was a statistical significant difference between the curve of the experimental group and the control group. To calculate the effect of pelvic floor muscle training between the two groups a Wilcoxon test was used amongst the maximal voided volumes between the 2 study groups. To examine the predictive factors (age, family history, arousability, motivation of the child (=cooperation on a 4 point scale), bladder capacity, polyuria and detrusor overactivity) in function of duration of success the Spearman coefficient for continue variables and the Wilcoxon test for categorical variables were used.

### Results

Of a total of 63 children with a mean age of 8.6 years, 2 children of the experimental group and 1 child of the control group didn't reach the success criterion within six months. The mean duration to become dry for the control group was 50 nights and for the experimental group 49 nights. No significant difference in efficacy and duration of treatment between the experimental and the control group was found. At 30 days the success rate was 34.9%, 63.5 % after 60 days, 76.2% at 3 and 4 months, 85,7% at 5 months and after six months the cure rate was 88.9% (Figure 1). Four children dropped out.

No significant difference in evolution of maximal voided volumes between the experimental group and control group was found (Figure 2).

Predictive factors for duration of reaching success were the age ( $p=0.044$ ) and the motivation of the child at the beginning of the treatment ( $p=0.009$ ).

Figure 1: Percentages of children with nocturnal enuresis in the experimental and control group in function of time

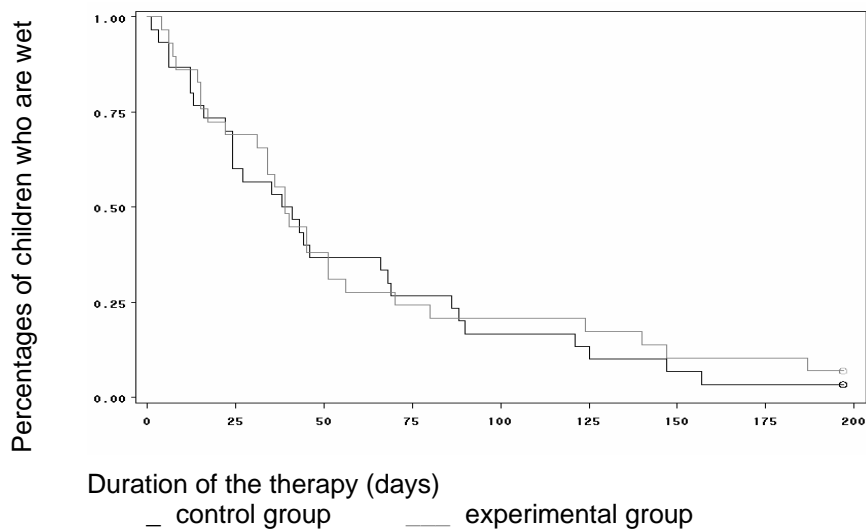
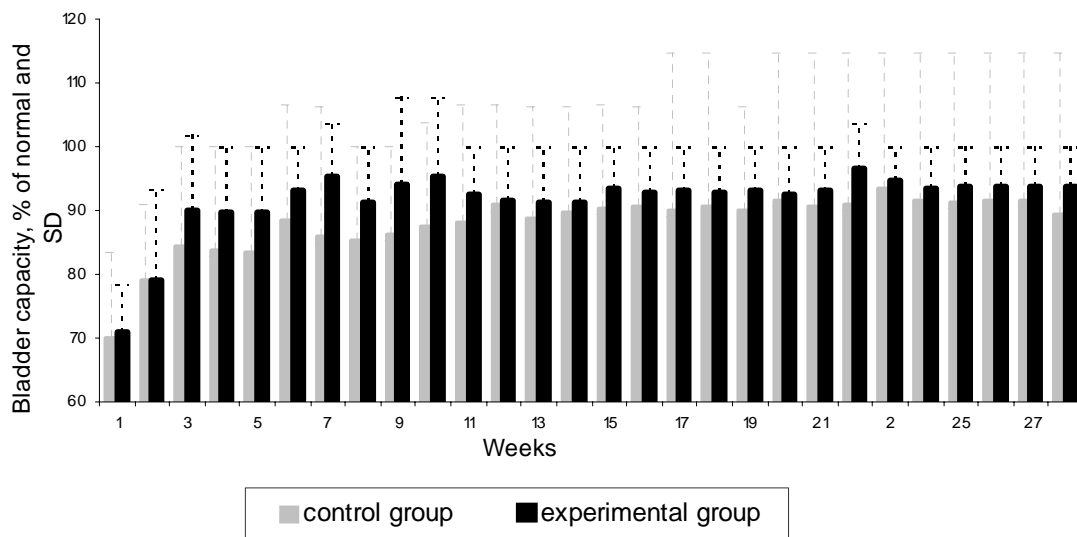


Figure 2: Evolution of the maximal voided volumes between the experimental and control group during treatment



Interpretation of results

No significant difference in efficacy and duration of treatment and in evolution of maximal voided volumes between the experimental group and control group was found. This study has also confirmed the high success rate of full spectrum therapy.

Concluding message

There is no beneficial effect of pelvic floor muscle exercises in the full spectrum therapy and in the increase of bladder capacity for nocturnal enuresis. Older children and those with better motivation at the beginning of the treatment had faster success rates.

[1] Pad-and-buzzer training, dry-bed training, and stop-start training in the treatment of primary nocturnal enuresis. Beh Psychoth 1985; 13: 309-19