

SHORT TERM EFFECT OF SACRAL SURFACE THERAPEUTIC ELECTRICAL STIMULATION TO THE DRUG RESISTANT NOCTURNAL ENURESIS

Aims of Study

Functional electrical stimulation has been used widely to treat lower urinary tract dysfunction ^{1) 2) 3)}. Many stimulating methods have been reported such as the anal, vaginal, sacral nerve roots and transcutaneous stimulation methods. Transcutaneous stimulation is less invasive and more acceptable to the patients ^{4) 5)}. We are developing a sacral surface therapeutic electrical stimulation (ssTES) method and a stimulating machine for home use to treat lower urinary tract dysfunction. In this study, we evaluated the efficacy of ssTES for drug resistant nocturnal enuresis patients without neurogenic diseases.

Methods

This study included five patients, 3 boys (11 to 16 years old), a 22-year-old man and a 23-year-old woman. All patients had no neurogenic disease and had received some type of treatment as primary nocturnal enuresis more than 15 times per month for at least two years. Urodynamics consisted of filling and voiding cystometry before and after the treatment. Electrical stimulation was performed at home twice daily for three months: for a 15-minute duration (10 seconds on 5 seconds off) at 20Hz frequency, 200 μ second pulse width and sub-maximum tolerable intensity to the patient. Surface electrodes were placed at the level of sacral root from S2 to S4 bilaterally. The patients keep an enuresis diary for one month before the stimulation and for the last one month during stimulation. During the electrical stimulation previous therapies were unchanged and continued.

Results

All patients urodynamically proved unstable detrusor in storage phase before ssTES. No patients had abnormal findings in voiding phase. Compliance of home ssTES was over 80% higher than that of scheduled stimulation. There was no side effects on ssTES. After three months ssTES, bladder capacity measured by filling cystometry was significantly increased, 200 +/- 94 (mean +/- S.D.) before the stimulation to 322 +/- 42 ml. (p=0.027; paired t-test). Nocturnal enuresis was decreased in all patients. Frequency of nocturnal enuresis was decreased 20.6 +/- 5.4 before the stimulation to 8.0 +/- 7.1 times (p=0.03) per month.

Conclusions

The results of this study show that ssTES, a safe and easy electrical stimulation method, can improve even severe drug resistant nocturnal enuresis.

References

- 1) Vodusek, D. B., Light, J. K. and Libby, J. M.: Detrusor inhibition induced by stimulation of pudendal nerve afferents. *NeuroUrol Urodynam*, 5: 381,1986
- 2) Tanagho, E. A. and Schmidt, R. A.: Electrical stimulation in the clinical management of the neurogenic bladder. *J Urol*, 140: 1331,1988
- 3) Elabadi, A. A., Magdy, M., Hassouna, M. M. et al: Neural stimulation for chronic voiding dysfunctions. *J Urol*, 152: 2076,1994
- 4) Bower WF, Moore KH, Adams RD. : A pilot study of the home application of transcutaneous neuromodulation in children with urgency or urge incontinence. *J Urol*. 2001 Dec;166(6):2420-2.
- 5) Hoebeke P, Van Laecke E, Everaert K, Renson C, De Paepe H, Raes A, Vande Walle J. : Transcutaneous neuromodulation for the urge syndrome in children: a pilot study. *J Urol*. 2001 Dec;166(6):2416-9.