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SURFACE ELECTRICAL STIMULATION FOR PATIENTS WITH VOIDING DYSFUNCTION

Aims of Study

The study evaluated the efficacy of a non-invasive interferential electrical stimulation applied to the third sacral dermatome in patients with voiding dysfunction due to pseudodyssynergia or pelvic floor overactivity.

Methods

Between November 2000 and October 2001, patients diagnosed as pseudodyssynergia or pelvic floor overactivity and who did not respond to medical treatment were enrolled in our study. The diagnosis was based on clinical history, videourodynamics or uroflow combined with pelvic floor electromyography. Pseudodyssynergia was diagnosed if videourodynamic study showed a high detrusor pressure at maximal flow rate (Pdet.Qmax) ($\geq$ 50 cm H2O in men, $\geq$ 40 cmH2O in women), low maximal flow rate (Qmax) ($\leq$15 mL /s in men and $\leq$12 mL /s in women), and the sphincteric EMG showed intermittent activity during voiding phase. Pelvic floor overactivity was diagnosed if the EMG activity showed no relaxation in conjunction with a normal Pdet.Qmax and low Qmax during voiding phase. Patients with current urinary tract infection, sensory urgency, true urethral stricture or neurogenic voiding dysfunction were excluded. We offered electrical stimulation delivered through surface electrodes over the S3 dermatome. The electrical pulse was set at an amplitude-modulated current of 20 Hz and a carrier frequency of 2500 Hz in continuous mode. The stimulation intensity was adjusted above sensory threshold without muscle contraction. The patients received the electrical stimulation for 30 minutes a session, three times a week. Subjects were excluded if they failed to attend at least six sessions. The response to electrical stimulation was assessed by International Prostate Symptom Score (IPSS), Qmax and flow pattern between baseline and at the end of treatment. The criteria for a success response were an improvement in IPSS of more than 50% with or without an objective confirmation of normal micturition.

Results

Twenty patients (10 males and 10 females, mean age 63 years old, range 47-80) completed therapy and were available for evaluation. Of the 20 patients, 6 were diagnosed as pseudodyssynergia and 14 as pelvic floor overactivity. The number of therapy the patients received ranged from 10 to 36 sessions (average 30). The mean IPSS decreased significantly from 21.2 to 10.2 with a mean of –11.0 points (p= .00). There was a mean decrease of 4.8 points in irritative symptom subscores and 6.3 points in obstructive symptom subscores. The mean quality of life score also improved from 4.7 to 2.6 (-2.1) points. Uroflowmetry analysis revealed significant increase in mean Qmax from 9.5($\pm$4.2) to 16.3 ($\pm$7.6) ml. per second (p= .00). Improvements in both IPSS and Qmax at the end of treatment were found in 9 (45%) patients, and 2 (10%) patients improved in IPSS alone. The total success rate was 55%. There was no significant difference in the total success rate between patients with pseudodyssynergia (66.7%) and patients with pelvic floor overactivity (50%). However, a significantly higher success rate was found in female (80%) than male patients (30%).

Conclusions

In patients with voiding dysfunction due to pseudodyssynergia or pelvic floor overactivity unresponsive to medical treatment, the use of surface electrical stimulation may be useful. The study used a sensory-level electrical stimulation of 20 Hz over S3 dermatome produced significant changes in presenting symptoms and urodynamic parameters in majority of the patients. The noninvasive method may be an effective treatment option or complement to other treatment for the alleviation of lower urinary tract symptoms in those patients.