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EFFECTS OF SACRAL SURFACE THERAPEUTIC ELECTRICAL STIMULATION FOR FEMALE RESIDENTS WITH OVERACTIVE BLADDER IN A GERIATRIC HEALTH SERVICES FACILITY

Hypothesis / aims of study

Sacral nerve electrical stimulation therapies have been widely used to treat lower urinary tract dysfunction. Most of the sacral nerve electrical stimulation therapies are implanted. However, we have treated overactive bladder (OAB) using transcutaneous electrical stimulation. The aims of the present study were (1) to evaluate the efficacy of sacral surface therapeutic electrical stimulation (SS-TES) as a noninvasive technique and (2) to assess the impact on quality of life (QOL) for female residents with OAB in a geriatric health services facility.

Study design, materials and methods

This study included 13 female residents with OAB. The mean age was 79.8±5.6 years (range 68 to 87). As result of the evaluation prior to treatment, 13 female residents were diagnosed with OAB dry in 3, OAB wet in 10. Electrical stimulation was performed twice daily for one month in their bed with a portable electrical stimulator: 15-minute duration (10 seconds on, 5 seconds off) at a frequency of 30 Hz, biphasic rectangular pulses, 200μs width at the sub-maximum tolerable intensity to the subject. The surface electrodes (10cm×6cm) were placed bilaterally at the level of the sacral root from S2 to S4. Evaluation of lower urinary tract dysfunction was performed before and after treatment using 24-hour monitoring wireless wetness sensing system. We changed the pad and/or diaper after each sensor response and measured the volume of leakage by weighing the pad and/or diaper. Moreover, the voided volume was measured during micturition by a urine meter installed in the toilet in the rest room. The subjects were monitored with a sensing machine for 2 days, and the voiding time, incontinence time, 24-hour frequency, incontinence episode(s), volume of micturition and leakage, urinary urgency, fluid intake time and volume and action observation at incontinence were recorded in a bladder diary. The post-void residual urine volume was measured three times with a portable three-dimensional ultrasound scanning device. In addition, QOL assessment was performed using the King's Health Questionnaire (KHQ) and the International Prostate Symptom Score (IPSS) QOL index before and after treatment. Statistical differences were determined by Wilcoxon's signed ranks test. P-values$<$0.05 were considered significantly different.

Results

As result of the evaluation after treatment, 13 female residents were diagnosed with OAB dry in 2, OAB wet in 8, nocturia in 1, and stress urinary incontinence in 2. Of 13 female residents, 3 varied from the OAB diagnostic criteria. The frequency of incontinence decreased significantly from 5.1±5.0 (mean±S.D.) times/day before treatment to 3.3±3.3 times/day after treatment ($p<0.01$). The volume of leakage decreased significantly from 273.4±386.6 mL/day before treatment to 186.9±311.5 mL/day after treatment ($p<0.01$). Urinary urgency decreased significantly from 3.6±2.1 times/day before treatment to 1.3±1.9 times/day after treatment ($p<0.01$). On the other hand, there were no statistically significant differences in 24-hour frequency, 24-hour production, post-void residual urine volume and 24-hour total fluid intake. The KHQ domain scores improved in all domains after treatment. The QOL index score improved significantly from 3.6 points before treatment to 2.1 points after treatment ($p<0.01$).
Moreover, there were no side effects of SS-TES.

Interpretation of results

SS-TES improved not only lower urinary tract symptoms but also quality of life. Urinary urgency disappeared in twenty three percent of subjects after treatment.

Concluding message

Our results suggest that SS-TES is effective for urinary incontinence, urinary urgency, and QOL among elderly female residents in geriatric health services facilities.

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What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**the Ethics Committee Tohoku University School of Medicine**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**