

## **ELECTROMYOGRAPHICAL CHANGES OF THE LEVATOR ANI MUSCLE IN WOMEN WITH URINARY STRESS INCONTINENCE**

### **Aims of Study**

Within the context of conservative treatment of female urinary incontinence the electromyographic(EMG)-based biofeedback pelvic floor reeducation is an effective and economical form of therapy. To what extent can urinary stress incontinence as consequence of pelvic floor functional disorder be verified by analysing electromyograms of the levator ani muscle?

### **Methods**

We examined 48 primiparous women (mean age: 44 years) electromyographically by conducting sum potentials of the levator ani muscle at rest and during volitional contraction using an intra-vaginal probe with surface electrodes. 31 women suffered from urinary stress incontinence (6 SIK I°; 9 SIK II°; 16 SIK III°), 17 asymptomatic women served as collective of comparison. Parameters of the EMG, the degree of incontinence and the pelvic organ prolapse were assessed in accordance with the classification of the International Continence Society (ICS).

### **Results**

Stress incontinent women showed a significantly lower EMG-potential than continent women both at rest ( $1.53 \pm 0.26 \mu\text{V}$  vs.  $2.47 \pm 0.47 \mu\text{V}$ ,  $p < 0.039$ ) and during maximum volitional contraction ( $9.00 \pm 1.77 \mu\text{V}$  vs.  $18.41 \pm 6.71 \mu\text{V}$ ,  $p < 0.0001$ ). The EMG-potentials of forced permanent volitional contraction of continent women were significantly higher than those of incontinent women ( $150.0 \pm 52.7 \mu\text{Vsec}$  vs.  $71.7 \pm 15.5 \mu\text{Vsec}$ ). Continent women showed a significantly higher reaction rate of fast-twitch-fibres than incontinent women ( $7.1 \pm 1.9 \mu\text{V/sec}$  vs.  $4.1 \pm 1.6 \mu\text{V/sec}$ ). A significant correlation between the degree of incontinence and EMG-potentials could be verified. With a rising degree of incontinence the baseline amplitude ( $r = -0.35$ ;  $p < 0.01$ ), the maximal contraction amplitude ( $r = -0.37$ ;  $p < 0.01$ ) and the amplitude of forced permanent volitional contraction ( $r = -0.35$ ;  $p < 0.06$ ) decreased. There was no significant correlation between the rising degree of incontinence and the reaction rate of fast-twitch-fibres. There was a significant correlation between EMG-parameters and the expression of a cystocele. With increasing cystocele the maximal contraction amplitude ( $r = -0.38$ ;  $p < 0.13$ ) and the amplitude of forced permanent volitional contraction decreased significantly. No significant correlation could be proved between the expression of a cystocele and the baseline amplitude or rather the reaction rate of fast-twitch-fibres.

### **Conclusions**

Female urinary stress incontinence is a consequence of pelvic floor functional disorder. This can be proved effectively and efficiently with the electromyogram of the levator ani muscle using surface electrodes fixed vaginally. The electromyography of the pelvic floor muscles is a simple and useful method for the assessment of a dysfunction of the pelvic floor muscles. It is moreover useful for the development of an individual pelvic floor reeducation program in case of female urinary incontinence.