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Title: EFFECTIVENESS OF SURFACE EMG AND MANOMETRY IN DIAGNOSIS OF PELVIC FLOOR DISORDER

Aim of study:

Purpose of this study is to evaluate whether surface EMG and manometry is a diagnostic tool or an indicator of good exercise of pelvic floor muscles.

The assessment of pelvic floor muscle function plays an important role in pelvic floor disorder. Pelvic floor muscle strength has traditionally been determined by palpitation and manometry.

Manometry was used as a biofeedback tool by Kegel in 1948. Manometry is considered as an easy method to evaluate pelvic floor muscle strength. However, manometric measurement of pelvic floor muscle strength includes PFM strength and abdominal muscle strength at the same time.

Surface EMG is a newly developed technique. There is a problem of the impedance. But it can measure not only pelvic floor muscle activity but also abdominal muscle activity respectively. Therefore, it is considered to be adequate for estimating the specific pelvic floor muscle strength.

Method:

Patients (n=27) were checked by HMT2000(HMT, Inc., Kontinence™) manometry at pre and post 6 weeks electrical stimulation therapy and biofeedback exercise therapy. Manometry was applied twice. Value of 2nd trial was recorded.

We took maximum value of surface EMG(V_{max}) from pelvic floor muscles and abdominal muscles recorded during pelvic floor muscle exercise.

Digital pelvic examinations were done by the same gynecologist to reduce the subjective inter-personal difference at pre and post therapy.

Digital pelvic floor muscle strength was also checked at pre and post therapy by Oxford scale (0:no, 1:flicker, 2:weak squeeze, 3:moderate squeeze & lift, 4:good squeeze & lift, 5:strong squeeze & lift).

Result:

Surface EMG maximum values(V_{max}) of pelvic floor muscle(PFM) showed 6.1 cm-H₂O (SD±3.0) at pretreatment and 7.1 cm-H₂O (SD±3.1) at post treatment. However V_{max} of PFM did not increase significantly (p=0.29) by treatment.

V_{max} of abdominal muscles showed pretreatment 9.1 cm-H₂O (SD±7.3) at pre and 5.3 cm-H₂O (SD±2.4) at post treatment. V_{max} of abdominal muscles decreased very significantly (p=0.006) after treatment.

In manometry, pressure values showed 26 cm-H₂O (SD±18) at pretreatment and 25 cm-H₂O (SD±14) at post treatment. Difference of manometric pressure was not significant (p= 0.87).

As duration of contraction(endurance) showed 5.5sec (SD±3.6) at pre and 10.3sec (SD±5.7) at post treatment, difference in duration of contraction (endurance) of pre and post treatment increased

significantly($p= 0.002$).

Digital pelvic floor muscle strength of Oxford method(from 1.85 SD \pm 0.9 to 2,7 SD \pm 1.3) increased significantly($p= 0.001$).

Conclusion:

Manometric measurement is not diagnostic of pelvic floor disorder because it includes the pressure of pelvic floor muscles and abdominal muscles at the same time. But we think that increasing endurance means reinforcement of slow twitching muscle fibers by electrical therapy and biofeedback endurance exercise.

It is considered that the decrease of V_{max} of abdominal muscles is a good indicator of successful PFM specific exercise not including abdominal muscles. The coordination of abdominal and pelvic floor muscles rather than simple increase of pelvic floor muscle strength is considered to be important in prevention and treatment of pelvic floor disorder.