

## REAL TIME ULTRASOUND IMAGING AS A TOOL OF BIOFEEDBACK AND CLINICAL REASONING DURING PHYSICAL THERAPY

### Hypothesis / aims of study:

What are the options to control the physical therapy selected parameters and to verify the success of treatment? In this times Kegel exercises are still in research projects used as the gold standard. How to control and specify exercises for individual subjects? It is important to see what the patient considers to be correct. The necessary intensity of pelvic floor tension is controversial discussed. Before training the subject should learn to do the right contraction and should be taught afterwards in functional positions and movement pattern. Often patients with good pelvic floor power has stress urinary symptoms during exercising or dancing. It is important to find out what needs to be change in exercising.

Also standard is the digital examination in supine and standing, and the surface Electromyography with internal probes or external pad electrodes. Here can arise summation potentials, a movement sequence has to much complexity, or a digital examination is not feasible.

### Study design, materials and methods:

In numerous publications it is shown that biofeedback procedures are well targeted movement sequences to learn. The abdominal ultrasound with a convex transducer can use the base of the bladder to recommend a pelvic floor contraction and relaxation. In the perineal view it gives also a good overview about the contractility and relaxation of the pelvic floor muscles. Segmental stabilization can be controlled with the M. transversus abdominis. For functional stability and activity is the M. Transversus abdominis important.

There were 8 different positions tested with 20 women. The design described 1.) sitting in a slump position, 2.) position with slight lordosis, 3.) sitting on a wedge pillow, 4.) sitting on a air pillow, 5.) sitting on a swiss ball, 6.) standing position, 7.) stand on right leg, 8) stand on left leg. The pelvic floor contraction were tested digitally, 30 minutes earlier the subjects drank 500 ml water. The Esaote Ultrasound device with a konvex probe showed images in relaxation and during contraction of the position of the bladder ground. The subject were told to contract much as possible. During different pelvic floor muscle power the bladder ground were watched and valsalva manövre or working by abdominal wall could be exposed.

### Results

The subjects showed different contractibility in different positions, some of them started to use immediately the abdominal wall or started valsalva manoeuvre. With the RTUI the best position could identified and individual training exercises were give to the subject.

### Interpretation of results

The women have learned during physical therapy to optimize the pelvic floor contraction and perform it while movements or activities of daily life. Testing different positions identified biomechanical instabilities, individually this could be included in a functional treatment concept. The control which exercises, which intensity is performing an optimal contraction could be watched by the women. Furthermore she understood why less power is better to hold and miss the valsalva manövre. The acquired knowledge are integrated into everyday life and everyday processes.

### Concluding message

The women leaving the physical therapy with the safety doing it right. This increases the compliance and dyscoordination is detected early and avoided. Ultrasound improves physical therapy, is noninvasive and shows quick results.

### Disclosures

**Funding:** No fundings **Clinical Trial:** Yes **Public Registry:** No **RCT:** No **Subjects:** HUMAN **Ethics not Req'd:** In this study we used Ultrasound Imaging as a biofeedback tool to show patients the structures while exercising. We saved images as we usually do it. There has been nothing what is not usual in our daily work. **Helsinki:** Yes **Informed Consent:** Yes