

## **MOTOR EVOKED POTENTIALS FROM THE PELVIC FLOOR MUSCLES**

### **Aims of Study**

Motor evoked potentials (MEPs) are used in the diagnosis of neuropathies. As lower urinary tract dysfunctions often accompany these diseases we wanted to study the application of the method as a test of pelvic floor innervation. However, transcutaneous magnetic stimulation is broadly focused and the specificity of the method therefore depends on the precision of the recording of action potentials from the target muscle. The pelvic floor muscles are not easily accessible to electrode placement, and the proximity of stimulus and recording is a problem when measuring peripheral latencies. The long-term reproducibility of pelvic floor MEPs is also an unaddressed issue.

### **Methods**

A group of 30 healthy women with a mean age of 52 years and without evidence of neurological or lower urinary tract disease were studied. Transcutaneous magnetic stimulation of cortical and spinal hot-spots was performed. Compound motor action potentials were recorded with concentric needle electrodes placed in the striated urethral sphincter and in the puborectalis, and with two different surface electrodes (intra-vaginal and intra-urethral). Stimulations were performed with the pelvic floor resting and with tonic contraction (facilitated responses). Success-rates of the different electrodes were calculated as the ratio between acceptable curves and expected responses, and compared with Pearson's chi-square test. Eighteen subjects had serial measurements of pelvic floor MEPs with a mean interval of 39 weeks. Agreements between electrodes in the first trial, and between serial measurements, were compared using Bland-Altman plots.

### **Results**

There were no significant differences between the latencies recorded with the various electrodes from either muscle, but the limits of agreement were wide. There was a significant effect ( $p=0.02$ ) of electrode type on success-rate, with recordings via concentric needle electrodes from the puborectalis being superior. There was a poor long-term reproducibility of pelvic floor MEPs, with i.e. limits of agreement of  $\pm 2.0 - 2.2$  ms for cortical facilitated puborectalis MEPs.

### **Conclusions**

We advocate the use of concentric needle electrodes for the study of pelvic floor MEPs. However, the technical difficulties and poor reliability of the method limit the clinical applicability of the method.