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Title: Motor evoked potentials from the striated urethral sphincter: a comparison of concentric needle and surface electrodes

Aims of study:

Transcranial magnetic stimulation of cortical motor centers is broadly focused, and each stimulation evoke concomitant responses in adjacent muscle groups. The specificity of the method therefore rests on the precision in registering the motor evoked potentials from the target muscle. The urethral sphincter is a small muscle with a unique motor innervation. Stronger signals from larger, surrounding muscles (i.e. pelvic floor and gluteals) might contaminate results if surface electrodes are used.

Methods:

We compared two different surface electrodes (intra-vaginal and intra-urethral) with the concentric needle as a gold standard, and by concomitant testing of the levator ani as a potential contaminator. We studied 30 healthy women with a mean age of 52.1 years. Bland-Altman plots were used to compare recorded latencies from the various electrodes and muscles.

Results:

There was no significant difference between the latencies recorded with the various electrodes from either muscle, but the limits of agreement were wide. However, the concentric needle electrodes proved more reliable with a higher rate of reproducible responses.

Conclusions:

We did not encounter major difficulties in using the concentric needle electrode for recordings in the external urethral sphincter, and this electrode was also more reliable than either surface electrode. We therefore advocate the use of concentric needle electrodes in further studies.

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