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MAGNETIC EVOKED MOTOR POTENTIALS (MEP) DURING CYSTOMANOMETROGRAPHY (CMG): A NEW DIAGNOSTIC TOOL TO ASSESS PERIPHERAL AND CENTRAL INNERVATION OF THE EXTERNAL URETHRAL SPHINCTER IN SPINAL CORD INJURED (SCI) PATIENTS.

INTRODUCTION & OBJECTIVES:

In SCI patients clinical examination does not consider pelvic muscle function and voluntary anal contraction (VAC) is less related to external urethral sphincter (EUS) activity Therefore, assessing of neurogenic voiding disorders needs more accurate information about efferent motor pathway to the EUS. This prospective study aims at evaluating motor nervous pathways responsible for EUS activity after SCI by means of combined simultaneous CMG and MEP recordings from EUS with a special microtip catheter

MATERIAL & METHODS:

23 SCI patients (15 male, 8 female, 8 paraplegic, 2 tetraplegic, 10 cauda lesions, 3 multiple sclerosis) and 7 control subjects entered the study All were neurological examined according to the ASIA protocol and underwent full video-urodynamic examination Simultaneously to urethral pressure measurement, MEP of the sphincter urethrae were evoked by transcranial and lumbar (L1/L4) magnetic stimulation (biphasic stimuli, 0 2 ms duration) EUS responses were recorded using a microtip pressure catheter with surface electrodes plugged in an electromyograph Data from different patient groups were analysed relative to MEP latency and pressure changes of urethral sphincter and a ratio (transcranial/lumbar latency) was calculated.

RESULTS:

In all 7 subjects without neurogenic bladder dysfunction MEP latencies from EUS could be recorded after transcranial (mean 19 7 ms +/- 2 ms SD) and lumbar (mean 4 5 ms +/- 0 4 ms SD) magnetic stimulation and spinal/lumbar ratio was 4 37 All patients and control subjects with VAC showed EUS pressure rising after both stimulation types In 3 multiple sclerosis patients with incontinence and weak VAC transcranial MEP showed a pathological mean latency of 25 3 ms whilst normal lumbar mean latency of 4 3 ms Ratio was 5 8 indicating damage of upper motor neuron Similar findings (22 4 ms/4 3 ms) with a ratio of 5 3 could be recorded in 5 incomplete paraplegic patients, whereas in 5 complete lesions only lumbar MEP with 4 4 ms latency could be evoked In incomplete cauda lesions (4) with incontinence and weak VAC transcortical MEP latency was mean 22 ms, whereas lumbar MEP latency was comparatively higher with mean 6 4 ms Ratio was 3 4, indicating nerve damage distal from spinal cord In complete cauda lesions neither transcranial nor lumbar MEP could be measured and no pressure rising in EUS was found

CONCLUSIONS:

Simultaneous recording of MEP and pressure reactions of EUS using a specially adapted microtip catheter is a reliable and painless diagnostic tool for additional information during CMG about integrity of central and peripheral nervous pathways involved in continence mechanisms