

## ARE PUDENDAL AFFERENT FIBRES INVOLVED IN AUTONOMIC DYSREFLEXIA?

### Aims of Study

Stimulation of pudendal afferent fibres during sexual intercourse, electro-ejaculation and vaginal dilatation may elicit autonomic dysreflexia (AD) in patients with spinal cord injury (SCI) on high neurological level. On the other hand, electrical pudendal stimulation is used as a neuromodulative treatment for neurogenic incontinence. In SCI patients with high lesion levels the occurrence AD needs to be considered during pudendal stimulation. This study aimed at evaluating the influence of pudendal nerve stimulation on the cardiovascular system in SCI patients in order to study the underlying neuronal mechanism of AD and the potential risk during stimulation.

### Methods

21 male patients with a complete SCI were divided in two groups according to the level of lesion: group A (C6-T6, n=15) and group B (T7-L2, n=6). 64 stimulations using biphasic rectangular impulses (0.2 ms, 10 Hz) with intensities up to 100 mA were applied to the dorsal penil nerve. In 6 patients from group A 18 stimulations were repeated after intravenous application of 7 mg of phentolamine. Heart rate (HR) and blood pressure (BP) were continuously recorded by a Finapres<sup>®</sup> cuff applied to the right index finger. Bladder pressure to identify detrusor contractions and external urethral sphincter pressure to observe the effect of stimulation were recorded by a transurethral microtip transducer. During stimulation the appearance of clinical AD symptoms like head ache, sweating and paraesthesia was recorded from the patients. Data were statistically evaluated by analysis of variance for repeated measurements (ANOVA, level of significance  $p < 0.05$ ).

### Results

Electrical stimulation was well tolerated in all cases. No patient reported any direct sensation associated with stimulation. Patients with lesions above T6 (group A) reported mild or moderate symptoms of AD for the time of stimulation (mostly head ache and sweating above the level of lesion). Patients with lesions below T6 did not note any of these symptoms during stimulation.

Mean initial HR per minute decreased during stimulation in group A significantly ( $p=0.0002$ ) from 67 to 58 and in group B non significantly from 69 to 64. Mean initial systolic BP increased during stimulation in group A significantly ( $p < 0.0001$ ) from 128 to 161 mmHg and in group B non significantly from 125 to 138 mmHg. Mean diastolic BP increased in group A from significantly ( $p=0.0003$ ) from 61 to 76 mmHg and in group B non significantly from 64 to 70 mmHg. Phentolamine decreased the resting BP and reduced the BP during stimulation significantly ( $p < 0.05$ ).

### Conclusions

Increases of BP accompanied with bradycardia following pudendal nerve stimulation in patients with high SCI suggest AD. Our results show a strong effect of electrical pudendal nerve stimulation on HR and BP in patients with complete SCI above T6 and may indicate, that somatosensory afferent fibres of the pudendal nerve are involved in the neuronal mechanism of AD in SCI patients with high neurological level. Severe hypertension should be taken into consideration during diagnostical or therapeutical stimulation of pudendal afferent fibres. The alpha-blocking agent phentolamine enable a significant BP reduction during stimulation and may act as protective factor for SCI patients undergoing pudendal nerve stimulation.