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Detrusor Hyperreflexia in Stroke

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Abstract: In this study detrusor hyperreflexia was investigated by urodynamic study during the acute phase of stroke in patients who became incontinent after a cerebrovascular accident. Urodynamic studies reveal physiopathological findings of incontinence while the acute period of cerebrovascular accident do not cover

neurogenic bladder features. In our study it was observed that most of the patients (60%) had normal bladder functions and detrusor hyperreflexia was a rare findings. This result is consistent with the other studies in literature.

Key Words: Detrusor hyperreflexia, stroke.

Introduction

Voiding disorders happen very frequently during the acute phase of a stroke. Although incontinent patients who have lesions above the brain stem are expected to have involuntray bladder contractions, urodynamic studies generally do not support this assumption. Clinical studies indicate that detrusor hyperreflexia is a rare findings in these patients and most of the patients have normal bladder functions (1). It is alsosuggested that incontinence happened after a cerebrovascular accident is a reversible condition and must be due to an unbalance between cortical and pontomesencephalic centers. The objective of this study is to observe the cystometric changes in the acute period of a stroke.

Material and Methods

The study was done between May 1995 and December 1995. 15 paients who became incontinent after a cerebrovascular accident were included into the study. None of the patients were comatose and their Glasgow coma scales weremore than ten potionts. All the patinets underwent an urological evaluation including firstly a descriptive history and physical examination. It was known from the history of the patients that none of them had voiding problems before the cerebrovascular event. Urodynamic study was done to all of patients in the first 5 days of the stroke. Cystometric studies were performed by using a multichannel urodynamic system (Griffon Urodynamics V.2.04v, England.). 37° centigrade

isotonic sodium chloride solution used for instillation at the filling speed of 20 ml/min.. The presence of detrusor contractions with amplitude of 15 cm H₂O of or over the filling phase of cystometry was accepted as detrusor hyperreflexia. Progressive stroke cases were excluded from the study in order to establish a correlation with a stable clinical state and prognosis of urinary incontinence. The pathological type of the cerebrovascular lesion (thrombosis or hemorrhage) was not a special condition for the study. All of the patients with the cortical and subcortical lesions were incontinent. The examination was repeated one week later regardless of the patients' status of incontinence.

Results

Of the 15 patients with stroke 8 cases were male, and the others were female. The patients' mean age were 61.7±5.9. Patients did not have any risk factor other than high blood pressure and hyperlipidemia. All of the patients had stroke for the first time in theri life. Cerebrovascular lesion was hemorrhage in 2 (13%) patients and the other 13 (87%) patients had infarct in one of the territory of middle (80%), anterior (2%) or posterior (1%) cerebral arteries. Symptoms, CT, and cystometric findings were summarised in table 1.

Discussion

Urinary incontinence is a very frequent complaint

Table 1. CT and cystometry findings

	Age	Lesion in CT	Neurological Findings	Cystometry
1	65	Left Temporoparietal infarct	Sensorial dysphasia, Right hemiparesis	NM*
2	65	Left Temporoparietal infarct	Global dysphasia, Right hemiparesis	NM
3	68	Left Frontotemporo-parietal infarct	Global aphasia Right hemiplegia	DH**
4	77	Right Thalamic hematoma	Left hemiplegia	DH
5	70	Left Frontal infarct	Right Hemiparesis Motor aphasia	NM
6	65	Right Frontotemporo-parietal infarct	Right Hemiplegia Global aphasia	NM
7	66	Left Frontal infarct	Right Hemiparesis Motor aphasia	NM
8	54	Right Temporal Hemorrhage	Confusion	
9	58	Right Frontoparietal infarct	Left Hemiparesis Motor dysphasia	DH
10	62	Right Temporoparietal infarct	Left Hemihypoesthesia Confusion	NM
11	49	Left Thalamic infarct	Right Hemiparesis	DH
12	61	Right Cerebellar infarct	Impaired Left sided Cerebellar tests	NM
13	47	Right Parietal infarct	Left Hemihypoesthesia	NM
14	57	Right Frontoparietal infarct	Left Hemiparesis, Motor dysphasia	DH
15	62	Left Temporoparietal infarct	Right Hemianopia Sensorial aphasia	DH

*NM: Normoactive bladder **Detrusor Dyperreflexia

after a stroke. However this symptom recovers in a short time period. Urodynamic studies reveal physiopathological findings of incontinence while the acute period of cerebrovascular accident do not cover neurogenic bladder features (1, 2, 3). In another study, it has been also shown that cystometry findings might be normal in spinal cord diseases (4). In this study, normal bladder functions were observed in 60% of the patients. This result is consistent with the other studies in literature.

The innervation of the bladder is very complex. Parasympathetic and sympathetic nerves are in a sensitive balance which is controlled by the higher cortical and subcortical centers. The parasympathetic center is located in the sacral and sympathetic center is in thoracic segments of the spinal cord. The detrusor muscle is innervated with parasympathetic nerves while the internal sphincter is innervated with sympathetic nerves. The external sphincter is composed of striated muscle fibres and is innervated segments via the pudendal nerves. The micturition center in the pontomesencephalic tegmentum of the periaqueductal region receives afferent impulses from the sacral cord segments and its efferent fibers course downward via reticulospinal tracts in the lateral funiculi of the spinal cord. This center also receives fibers

from anteromedial parts of the frontal cortex, limbic regions, amygdaloid nuclei, thalamus, hypothalamus and cerebellum (5, 6). In this study cerebrovascular lesions were located above the brain stem and micturition center was spared so it can be hypothesized that there were temporary unbalances between the cortex and the micturition center. Dysfunction of higher cortical functions of the patients like speaking, reading etc. did not improve though incontinence got well in a few weeks. It can easily be asserted that incontinence does not depend on the cortical localisation of the lesion. Gelber performed urodynamic studies in 51 patients who were diagnosed cerebrovascular accident and 19 were incontinent and observed that most of the patients had wide lesions and were aphasic (1). In another study, Arena obtained similar results (7). Most of the urodynamic investigations have inconsistent results with the clinical situation of the patient in the acute phase of cerebrovascular accident but healthy cortical structures induce the balance again in a short time period. We concluded that micturition center's effects over the sacral segments decline temporarily. However, this theory needs evidence by postmortem studies.

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