



Voiding Disorders in Patients with Cerebrovascular Accident

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Abstract

Background: Cerebrovascular accident often happens in elderly group, frequently causing voiding dysfunction. The aim of the study was to determine the magnitudes of various types of voiding disorders among patients of cerebrovascular accidents attending in Dhaka Medical College Hospital.

Methods: It was a cross-sectional study conducted at the department of Urology of Dhaka Medical College Hospital from July 2009 to June 2011. Hundred and eight patients were enrolled in the study.

Results: More than 61% subjects were male (n=66). Leading number of patients (45.4%) had three to six months disease duration. In this group 67.3% had overactive bladder, 64.7% had underactive bladder and 24.5% had normal activity of bladder. In patients with irritative symptoms majority had overactive bladder (71.4%) while in patients with obstructive symptoms half of the subjects had overactive bladder (50.0%). Majority of the subjects with DM (71.4%) and HTN (82.6%) had overactive bladder. Seventy percent (n=) subjects with overactive bladder had arterial stroke while around 82% (n=) of the underactive bladder subjects had venous stroke. More than 85% subjects with underactive bladder and around 78% subjects with overactive bladder had infection.

Conclusion: Voiding dysfunction is a common sequel of acute stroke and most of the patients with irritative symptoms and about half of the subjects with obstructive symptoms had overactive bladder. Diabetes mellitus, hypertension and arterial stroke were found to be associated with overactive bladder.

Keywords: voiding disorders, cerebrovascular accident

Introduction

Cerebrovascular accident (CVA) or stroke is a serious neurological event primarily affecting the elderly causing temporary or permanent morbidity. Impairment of voiding control is one the most critical sequelae of stroke which makes CVA important to

urologists. More than 500,000 CVAs occur annually in the United States, and one third of them are fatal, another third required long-term medical care and the remaining third allow patients to return home with restored function.¹ Hypertension, diabetes mellitus, smoking, raised serum cholesterol, alcohol

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consumption, obesity, stress and a sedentary lifestyle are the major risk factors for cerebrovascular accident.²⁻⁵ Recently the incidence of cerebrovascular accident in individuals older than 70 years and the mortality rate have been decreasing,^{6,7} but the disease burden remains high. A cerebrovascular accident may have a profound effect on the genitourinary tract. A particular problem is voiding dysfunction, which may range from urinary retention to complete incontinence.⁸⁻¹² Significant sexual dysfunction is another possible effect. However, because cerebrovascular accidents occur predominantly in the elderly population, evaluation and management are often complicated by coexisting genitourinary dysfunction, such as bladder outlet obstruction in men or stress urinary incontinence in women. Also, various co-morbid conditions, including diabetes mellitus, vascular dysfunction and coronary artery disease, may affect the genitourinary system. Furthermore, changes secondary to aging, such as bladder instability, change in circadian rhythm, hormonal decrease and cognitive impairment may disturb the function of the genitourinary tract. The effects of any of these conditions may be erroneously attributed to a cerebrovascular accident and increase the difficulty of management. Some urological findings help when assessing the overall condition of the stroke patient. Particularly urinary incontinence immediately after a stroke implies a poor overall prognosis.^{13,14} Wade and Hewer followed 532 patients beginning shortly after the onset of a cerebrovascular accident and observed that those with urinary incontinence within the first week fared poorly with half dying within 6 months.¹⁶ Incontinence at 3 weeks also predicted a higher risk of death as well as a lesser chance of regaining mobility. Moreover, of the 44% of patients with urinary incontinence 63% had an alteration in the level of consciousness, whereas only 1% of the 300 continent patients had a similar change. Taub et al. reviewed 639 registered cerebrovascular accident patients for disability at 3 and 12 months, and noted that initial incontinence was the best single indicator of future disability with 60% sensitivity and 78% specificity.¹³ Given these data it is clear that urologists are frequently called on to evaluate and treat the stroke patient.

Materials & Methods

This cross-sectional observation study was carried out at the department of Urology, Dhaka Medical College Hospital from July 2009 to June 2011. Hundred and

eight patients aged >40 years having voiding dysfunction attending in the department of Urology of Dhaka Medical College Hospital and Neurology department was included in the study by using purposive sampling technique.

A comprehensive history was obtained & physical examination was performed in all patients after CVA with voiding dysfunction & all patients underwent multichannel urodynamic study by a 10F filling catheter into the bladder & simultaneously measurement of vesicle & abdominal pressure during filling & voiding. Voiding symptoms were classified as obstructive, irritative or mixed.

Ethical permission was taken from Dhaka medical college Ethical Review Committee for data collection. Consent was received from each individual prior to inclusion. They were informed of their right to withdraw from the study at any stage. Assurance had been given that the data would be collected anonymously and the confidentiality concerning their information would be maintained strictly. The research was conducted in full accord with ethical principles.

The data were analyzed with the SPSS for Windows (IBM SPSS Statistics for Windows, version 25.0, Armonk, NY:IBM Corp.) software. The result was presented in tables, figures, and diagrams. Using t test, chi square and other statistical test was done for significance of difference. A P value <0.05 was considered as level of significance.

Results

Out of 108 patients 66 (61.1%) were male (Fig. 1). Regarding duration of the disease more than one third of the subjects were in 91 to 180 days group (45.4%) followed by 1 to 90 days duration group (38.9%) (Fig. II). In the early mentioned group 67.3% had overactive, 24.5% had underactive and 8.2% had normoactive bladder (Table I). Among the subjects with irritative symptoms majority had overactive bladder (71.4%) followed by underactive bladder (22.1%) and normally active bladder (6.5%). Among the subjects with obstructive symptoms half of the subjects had overactive bladder (50.0%) followed by underactive bladder (45.5%) and normally active bladder (4.5%). On the other hand among the subjects who had both irritative and obstructive symptoms overactive bladder and normally active bladder constitutes the same proportion (44.4%) (Table II).

Majority of the subjects with DM (71.4%) and HTN (82.6%) had overactive bladder. About 72% subjects with both DM and HTN had overactive bladder. 78.3% study subjects with no chronic diseases had underactive bladder. Statistically these differences were highly significant (Table III).

On the other hand majority subjects with overactive bladder had arterial stroke(70.0%). Most of the underactive bladder subjects had venous stroke (82.1%) (Table -IV). The proportion of arterial and venous stroke among the subjects with normal active bladder were equal(50.0%). These differences were statistically highly significant.

More than two thirds of the subjects with overactive subjects had infection (78.6%) and importantly infection rate was 85.7% in underactive bladder. Infection was present in 70.0% cases among subjects with normal active bladder. Statistically these differences were significant (Table V).



Fig-1: Sex distribution of the study subjects

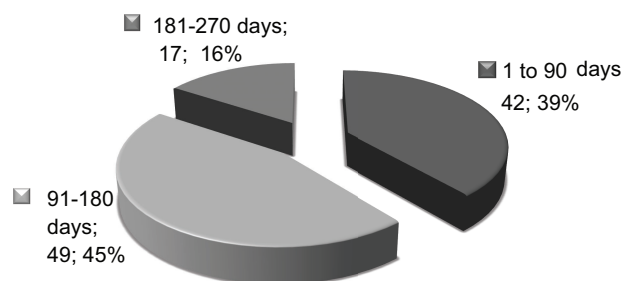


Fig-2: Distribution of the study subjects by duration of symptoms

Table-I : Relation of duration of symptoms with bladder activity among the study subjects

Duration of symptoms (days)	Overactive bladder	Underactive bladder	Normal activity of bladder	χ^2 test	p- value
1-90 (n, %)	26 (61.9)	12 (28.6)	4 (9.5)	0.475	0.976 (ns)
91-180 (n, %)	33(67.3)	12 (24.5)	4(8.2)		
181-270(n, %)	11 (64.7)	4(23.5)	2(11.8)		

ns=Not significant

Table-II : Relation of types of symptoms with bladder activity among the study subjects

Types of symptoms	Overactive bladder	Underactive bladder	Normal activity of bladder	χ^2 test	p- value
Irritative (n, %)	55(71.4)	17(22.1)	5(6.5)	19.47	0.001 (s)
Obstructive (n, %)	11(50.0)	10 (45.5)	1(4.5)		
Mixed (n, %)	4(44.4)	1 (11.1)	4 (44.4)		

s=Significant

Table-III. Chronic diseases related Bladder activity among the study subjects

Chronic disease	Overactive bladder	Underactive bladder	Normal activity of bladder	χ^2 test	p- value
DM (n, %)	15 (71.4)	2 (9.5)	4 (19.0)	45.417	0.001 (s)
HTN (n, %)	38 (82.6)	4 (8.7)	4 (8.7)		
Both DM and HTN (n, %)	13 (72.2)	49 (22.2)	1 (5.6)		No chronic disease
(n, %)	4 (17.4)	18 (78.3)	1 (4.3)		

DM=Diabetes mellitus; HTN=Hypertension; s=Significant

Table- IV : Association of bladder activity *d* with type of stroke among the study subjects

Bladder activity	Arterial stroke (Ischaemic)	Venous stroke	χ^2 test	<i>p</i> - value
Overactive (n, %)	49 (70.0)	21 (30.0)	22.034	0.001 (s)
Underactive r (n, %)	5 (17.9)	23 (82.1)		
Normal activity (n, %)	5 (50.0)	5 (50.0)		

s=Significant

Table- V: Association of bladder activity with presence of infection among the study subjects

Bladder activity	Infection present	Infection absent	χ^2 test	<i>p</i> - value
Overactive (n, %)	15 (21.4)	55(78.6)	13.27	0.001 (s)
Underactive r (n, %)	4 (11.3)	24 (85.7)		
Normal activity (n, %)	3 (30.0)	7 (70.0)		

s=Significant

Discussion

In this study more than half of the subjects were male (61.1%) and 42 (38.9%) were female. This finding is comparable with that of the Anupom et al.¹⁵ study where out of 40 patients 22 (55%) were male. However, in another study Natsume reported higher preponderance of male (34 out of 57, 70%) than others.¹⁶ In the current study more than one third of the subjects were in ninety one to one eighty days group (45.4%) followed by 1 to 90 days duration group (38.9%). Rests were in 181 to 270 days duration group (15.7%).

Among the 1 to 90 days duration groups more than half of the subjects had overactive bladder (OBA) (61.9%). 28.6% had underactive bladder (28.6%). Only 9.5% had normal activity of bladder. Similarly 91 to 180 days duration group and 181 to 270 days duration group this proportion was 67.3% and 64.7%, 24.5% and 23.5%, 8.2% and 11.8% respectively. But all these differences were not statistically significant. In a study Hashim & Abrams.¹⁷ determined how well the symptoms of OAB syndrome correlate with urodynamic DO using International Continence Society definitions. They found that there was a better correlation in results between OAB symptoms and the urodynamic diagnosis of Detrusor overactivity (DO) in men than in women.

Among the subjects with irritative symptoms majority had overactive bladder (71.4%) followed by underactive bladder (22.1%) and normally active bladder (6.5%). Among the subjects with obstructive symptoms half of the subjects had overactive bladder

(50.0%) followed by underactive bladder (45.5%) and normally active bladder (4.5%). On the other hand among the subjects who had both irritative and obstructive symptoms overactive bladder and normally active bladder constitutes the same proportion (44.4%). Rests had underactive bladder (11.1%). Statistically these differences were significant. In another study Victor et al.¹⁸ (1996) stated that among the 38 men 16 (42%) were irritative, 13 (34%) were obstructive and 9 (24%) were mixed. In a large cohort of 935 consecutive patients with acute stroke in Denmark, 36%, 11%, and 53% of the patients had full urinary incontinence, partial urinary incontinence, and no urinary incontinence at admission, respectively; the corresponding figures at 6-month follow-up were 8%, 11%, and 81%, respectively.¹⁹

Urodynamically 24 patients (63%) had obstruction, 9 patients (24%) had no obstruction and 5 (13%) had equivocal findings. Detrusor hyperreflexia was noted in 23 (92%) of 25 patients of mixed (irritative and obstructive) and 8 (62%) of 13 patients with obstructive type. Statistically these findings were significant and support our study findings. In the current study majority of the subjects with DM (71.4%) and HTN (82.6%) had overactive bladder and 72.2% subjects with both DM and HTN had overactive bladder. Around 78% study subjects with no chronic diseases had underactive bladder. Statistically these differences were highly significant. A cross sectional study by Anupom et al. pointed out that among the patients 22 (55%) had HTN alone, 15 (37.5%) had DM and 10 (25%) had both DM and HTN.¹⁵

In our study majority subjects with overactive bladder had arterial stroke (70.0%). Most of the underactive bladder subjects had venous stroke (82.1%). The proportions of arterial and venous stroke among the subjects with normal active bladder were equal (50.0%). These differences were statistically highly significant. In Anupom et al.¹⁵ study out of 40 patients 36 (90%) had arterial stroke. In Chen et al.¹⁷ study detrusor overactivity was commonly found in both ischaemic and haemorrhagic stroke patients.

It was found that more than two thirds of the subjects with overactive subjects had infection (78.6%) and it was 85.7% with underactive bladder. Infection was present in 30.0% cases among subjects with normal active bladder. Statistically these differences were significant. Sharon et al. explained that UTI is consistently found to be one of the most frequent complications of stroke which is in line with our study findings.²⁰

Conclusion

Voiding dysfunction is a common sequel of acute stroke and most of the patients with irritative symptoms had overactive bladder followed by underactive and normal active bladder. About half of the subjects with obstructive symptoms had overactive bladder. Diabetes mellitus, hypertension and arterial stroke were found to be associated with overactive bladder.

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