Preliminary Report

Incontinence and its Risk Factors in 123 Patients with Stroke in a Rehabilitation Setting in Kuwait

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ABSTRACT

Objectives: Incontinence of urine and feces is a common sequela of stroke and has significant importance both prognostically and socially for patients and their caregivers. The aim of this study was to evaluate the prevalence and risk factors of incontinence in patients with stroke.

Material and Methods: We retrospectively studied 123 patients with recent hemispheric strokes (infarction, hemorrhage), representing consecutive admissions to the Physical Medicine and Rehabilitation Hospital in Kuwait during 1998-1999. The following pre-selected risk factors were evaluated by means of univariate analysis: age, sex, history of former stroke, diabetes mellitus, hypertension, other disabling diseases, severity of motor deficit in the paralyzed limbs, aphasia, type, side and size of brain lesion, presence of urinary tract infection.

Results: There was a 53% prevalence of urinary incontinence (UI) on admission and 37% at discharge, which is comparable to other studies. Patients with initial UI were significantly older, had significantly more often communication deficit and severe motor deficit in the affected limbs; the brain lesions were more often large in size and more often multiple infarctions were detected on CT scan. Urinary tract infection showed a significantly higher rate in the incontinent group of patients. Fecal incontinence (FI) showed a 20% prevalence on admission and 4% at discharge and was significantly associated with age, aphasia, severe motor deficit, large and multiple infarctions, and comorbidity with other disabling diseases.

Conclusion: Age, aphasia, severity of stroke (severe motor deficit and large size and multiple brain lesions) are common significant risk factors for both urinary and fecal incontinence. Early recognition of the risk factors may assist rehabilitation management of stroke patients, particularly for appropriate treatment setting and improvement of their long-term outcome.

KEY WORDS: incontinence, risk factors, stroke

INTRODUCTION

Incontinence of urine and feces after stroke is of significant importance both prognostically and socially for patients and their caregivers. Incontinence may be present immediately after stroke or develop later in the recuperative phase[1]. Early urinary incontinence after stroke indicates poor outlook[2-5] and persisting urinary incontinence is known to increase the burden on caregivers[6].

The strictly neurological mechanisms of UI are somewhat unclear. The three major mechanisms suggested by Gelber[7] are disruption of micturitional pathways resulting in bladder hyperreflexia and urgency incontinence; concurrent neuropathy resulting in bladder hyperreflexia and overflow incontinence; and incontinence due to stroke related cognitive and language deficits with normal bladder function.

Though incontinence is an important prognostic feature, there are many gaps in our knowledge of the relationship between stroke and UI. Few studies are available in the literature showing the association between the development of UI and age[3,4], female sex[4] and certain neurological deficits, including lower level of consciousness[3,4], dysphasia[8,9], mental impairment[7,8], severe motor paresis[3,8,10] and the combination of hemiplegia, proprioceptive deficit and visual neglect[9]. A striking lack of information in the medical records about incontinence has been reported[11,12]. To our knowledge, no study is available on this important topic in Kuwait where hemiplegia due to cerebrovascular accident has a high incidence and is a major cause of disability in the adult population[13].

Identifying the risk factors for urinary and fecal incontinence after stroke can lead to appropriate treatment and improvement of the quality of life of the patient. Aggressive treatment of UI may reduce the cost of long-term hospitalization[14].

The purpose of this study is to retrospectively evaluate the prevalence and pre-selected risk factors for urinary and fecal incontinence in patients admitted for a comprehensive

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rehabilitation program to the Physical Medicine and Rehabilitation Hospital in Kuwait, following the acute stage of stroke.

MATERIAL AND METHODS

A total of 123 patients with recent stroke (infarction, hemorrhage), representing consecutive admissions to Physical Medicine and Rehabilitation Hospital during 1998-1999 were included in the study. Subarachnoid hemorrhage, strokes requiring cerebral surgical intervention, brain stem and cerebellar strokes were excluded. All patients were provided comprehensive rehabilitation programs in the standard multidisciplinary fashion (physical therapy and functional training for remediation of sensory-motor deficit, occupational therapy, speech and language therapy),

Data on urinary and fecal incontinence and its risk factors were obtained from the physiatrist's records in the patient's file and from the daily care flow sheet for each patient recorded by the nursing staff. A patient was classified as having urinary/fecal continence when he/she was fully able to control the bladder/bowel and had no accidents. The following risk factors for urinary and fecal incontinence were evaluated: age, sex, history of former stroke, diabetes mellitus, hypertension, other disabling diseases (cardiac, pulmonary, neurologic, peripheral vascular, arthritic diseases), severity of motor deficit, aphasia (expressive, perceptive, total), presence of urinary tract infection (UTI) as well as type (hemorrhage or infarction), site (right or left hemisphere) and size of brain lesion. Motor deficit was assessed by a physiatrist on admission, and was considered as 'severe' in stage 1 and stage 2 according to Brunnstrom classification[15].

Student and t-test for equality of means were used for quantitative variables and Fisher and chi-square for qualitative variables, values of $p<0.05$, were considered significant.

RESULTS

A total of 65 of 123 patients (53%) who participated in the study had urinary incontinence on admission; 46 remained bladder incontinent at discharge. This correlates to a prevalence of UI on admission of 53% and 37% at discharge.

Table 1 shows the demographic characteristics of patients with UI, and Table 2 demonstrates the results of univariate risk factors analysis of initial UI . Patients with initial UI were significantly older and had significantly higher communication deficit and severe motor deficit in the paretic limbs than the continent patients. The brain lesions were more often large in size and more often multiple infarctions were detected on CT scan evaluation in patients in the incontinent group. UTI showed a significantly higher rate in patients with urinary incontinence.

The prevalence of FI was 20% on admission and 4% at discharge. Characteristics of patients with FI

Table 1
Demographic profile of patients with and without urine incontinence

Variable	Group		P value
	Incontinent (n = 65)	Continent (n = 58)	
Mean age ± SD (yrs)	63.5 ± 9.4	56.5 + 12.3	0.001*
Sex (M/F)	34 / 31	29 / 29	0.79
Pre-admission Duration (weeks)	5.9 ± 6.7	5.6 ± 5.4	0.78
Length of Hospital Stay (weeks)	7.27 ± 4.8	6.7 ± 4.4	0.51

* p value < 0.05

Table 2
Characteristics of patients with and without urinary incontinence

Variable	Group		P value
	Incontinent (n = 65)	Continent (n = 58)	
Former Stroke	19	12	0.32
Diabetes Mellitus	38	29	0.34
Hypertension	34	34	0.48
Other Disabling Diseases	20	7	0.12
Motor Deficit Upper Limb			
Stage 1,2 / Stage 3,4,5	50/15	21/37	0.05*
Motor Deficit Lower Limb			
Stage 1,2 / Stage 3,4,5	53/12	21/37	0.05*
Aphasia	34	18	0.001*
Hemorrhage/Infarction	9/65	6/58	0.31
Right/Left Stroke	35/30	30/28	0.72
Large Size of Stroke	31	6	0.001*
Multiple Brain Lesion	18	7	0.02*
Urinary Tract Infection	32	14	0.006*

*p value < 0.05

Table 3
Demographic profile of patients with fecal incontinence

Variable	Group		P value
	Fecal Incontinent (n = 24)	Fecal Continent (n = 58)	
Mean age + SD (yrs)	63.2 + 10.3	56.5 + 12.3	0.02*
Sex - M/F	10/13	29/29	0.59
Pre-admission Duration (weeks)	4.17 + 2.1	5.6 + 5.4	0.207
Length of Hospital Stay (weeks)	6.27 + 3.4	6.7 + 4.4	0.68

*p value < 0.05

Table 4
Characteristics of patients with and without fecal incontinence

Variable	Group Incontinent (n = 24)	Group Continent (n = 58)	P value
Former Stroke	8	12	0.26
Diabetes Mellitus	16	29	0.17
Hypertension	14	34	0.98
Other Disabling Diseases	9	7	0.008*
Motor Deficit Upper Limbs Stage 1,2 / Stage 3, 4, 5	18/6	21/37	<0.05*
Motor Deficit Lower Limbs Stage 1,2 / Stage 3,4,5	17/7	21/37	<0.05*
Aphasia	8	5	0.001*
Hemorrhage/Infarction	9/13	18/40	0.35
Right/Left Stroke	8/16	16/32	0.26
Large Size of Stroke	20	15	0.001*
Multiple Brain Lesions	7	7	0.047*
Urinary Tract Infection	14	14	0.001*

*p value < 0.05

are shown in Table 3. Patients with FI were significantly older, more often had aphasia, severe motor deficit in paretic extremities, large and multiple infarctions on CT imaging and comorbidity of other disabling diseases (Table 4). A large overlap of the patients with UI and patients with FI was found. In the study, 36% of the patients with UI had FI and all patients with FI had UI as well.

DISCUSSION

UI is a common sequelae of acute stroke and its prevalence decreases with the time elapsed from stroke. Our patients were studied on admission 5.9 ± 6.7 weeks after the onset of the stroke and prevalence of UI was 53%. At discharge, after 7.27 ± 4.7 weeks, UI showed a prevalence of 37%. These findings are similar to those previously reported by Barer[3] and Borie[8]. It is likely that our incontinence figure would have been even higher if these patients had been evaluated earlier in the post stroke period as in other studies[1,4,7,10,16]. The prevalence of UI in our study is lower than that of an elderly population reported in two Japanese studies[17,18]. In the present study, only six patients (9%) in the incontinent group were recorded to have incontinence pre-stroke. As in other studies[3,19], pre-existing incontinence explained a small part of post-stroke incontinence.

Previous studies have shown the strong correlation between motor impairment and UI, suggesting that mobility issues are of primary concern[1,8,10]. Our findings confirm that UI is significantly associated with severe motor deficit (stage 1,2) in the paretic limbs. Aphasia has also been found to be a strong predictor for UI. This correlation has been reported in the literature[7,10]. Thus, stroke-related neurological deficit may be directly responsible for UI, as suggested by the Gelber[7], especially for patients with normal urodynamic function.

Information regarding the location of hemispheric lesions associated with UI is lacking. Although animal studies have identified various cortical and subcortical structures that influence voiding, the location of specific lesions that cause detrusor hyperrreflexia in humans remains speculative. Although some retrospective studies[20-22] noted bladder hyperreflexia in strokes involving cerebral cortex, internal capsule and basal ganglia, prospective studies of urinary incontinence after acute stroke[9,23] were not able to correlate lesion localization with the development of incontinence. Several studies have found a correlation between the size of stroke and UI[7,9,24], but not with type and site of the stroke[10]. In the current study, UI was strongly associated with the size of stroke (large strokes, multiple brain lesions) but not with type of stroke (hemorrhage or infarction) or site of stroke (left or right hemisphere). They suggest that UI results from multifocal impairments related to severity of deficit rather than to damage of specific micturitional control mechanism alone. This supports similar analysis by Wade[4] and Ween[10].

The correlation between age and UI in our study is in accordance with other studies[10,16]. The strong association between UI and UTI supports that UTI contributes to poor bladder control, as reported by other authors[10,25].

In our study, prevalence of FI at 4.17 ± 2.1 weeks after the stroke (on admission) was 20% and at discharge (5.6 ± 5.4 weeks after) was 4%. These prevalence figures are in agreement with other publications[4,7,16]. Age, severity of stroke (severe motor deficit, aphasia, large and multiple brain lesions) and comorbidity of other disabling diseases were significant risk factors in our study and have been proven in another study[16].

In conclusion, the current study offers preliminary data on prevalence and risk factors for urinary and fecal incontinence in patients with stroke that are comparable with other studies. Age, severity of stroke (severe motor deficit and large size and multiple brain lesions) and aphasia are proven to be common strong risk factors for both urinary and fecal incontinence. The study shows that patients with these risk factors need extra-attention and care for incontinence.

As this and other studies used univariate analyses only, it is not clear whether these factors have independent influence or they exert influence through association with other factors. On the other hand, important risk factors could have been obscured by these interactions. Further urodynamic studies are needed to detect the underlying

mechanism of bladder incontinence and to implement adequate medical treatment and physical therapy measures.

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