

Stroke and Urinary Incontinence

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Abstract: Stroke is a neurological emergency. It is one of the major causes of morbidity and mortality worldwide leaving either temporary or permanent disability on survivors. Urinary incontinence is a common consequence of acute stroke and correlates with poor outcome and depression in both carer and stroke survivors. Urinary incontinence occurring within 7days after a stroke is a strong prognostic factor for poor survival than a reduced level of consciousness during the period of admission with serious disability and considerable influence on discharge destination.

I. Introduction

Stroke is defined as “rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting more than 24hours or leading to death with no apparent cause other than of vascular origin”.¹ Stroke is one of the major causes of morbidity and mortality globally and ranks third as the most common cause of mortality in developed countries resulting in long term disability and accounting for 4.4 million deaths in the world.^{2,3}

Stroke is often associated with bladder dysfunctions. The dysfunctions range from retention of urine to total incontinence and have significant consequences on the lives of the patients.^{4,5} The International Continence Society defines urinary incontinence as the involuntary leakage of urine that causes hygienic or social problems.⁶ Urinary incontinence is a common consequence of acute stroke and correlates with poor outcome and depression in both carer and stroke survivors.⁷ Urinary incontinence has been reported to be a strong marker of stroke severity being associated with increased institutionalization and mortality rates compared with those who remain continent.⁸ Urinary incontinence occurring within 7days after a stroke is a strong prognostic factor for poor survival than a reduced level of consciousness during the period of admission^{9,10} with serious disability and considerable influence on discharge destination.¹¹

The outcome of stroke can therefore be predicted in the light of urinary incontinence. In a study involving 532 stroke patients, urinary incontinence occurring within 7days of stroke correlated with a poor prognosis with 50% mortality within 6months. Incontinence of urine at 21days also prognosticated an increased risk of mortality with a reduced likelihood of regaining mobility.⁵ Rotar et al had reported that patients who regain continence in the first week have a comparable outcome as the patients who do not have micturition disturbances post stroke.¹²

II. Aetiology

The incidence of urinary incontinence varies from 11% to 53 %^{13, 14, 15} while its prevalence ranges from 30%-80 % during admission, 25% after discharge with 15% remaining incontinent after one year.^{11, 16, 17} The causes of post stroke urinary incontinence are yet to be well understood despite the good knowledge of its prevalence. Three main mechanisms of poststroke urinary incontinence were suggested by Gelber et al.¹⁸ Urinary incontinence was said to result from direct injury to the neuromicturition pathways. The presence of cognitive or language deficits resulting from stroke has been thought of as another mechanism. Studies in the past had demonstrated an association between neurological deficits and urinary incontinence but had not reached a conclusion on whether these deficits were actually the cause of the incontinence.¹⁸ Reding and colleagues had reported on the relationship between urinary incontinence and aphasia, hemiplegia, visual neglect and loss of proprioception but found no association between impairment of cognition and incontinence.¹⁹ This was at variance with other studies that found a correlation between incontinence and impaired cognition.^{18, 20} Another cause of urinary incontinence was proposed to be detrusor hyporeflexia with overflow incontinence. This finding was reported by Gelber et al¹⁸ when he found 21% of incontinent patients to have detrusor hyporeflexia. This aligned with earlier studies that also observed detrusor hyporeflexia in 17%-25% of the incontinent patients.^{19, 21, 22}

III. Factors predicting outcome

The factors found to be associated with urinary incontinence include age, sex, hemiparesis, stroke risk factors, neurological impairments, consciousness, discharge destination, lesion size and site of lesion.

An older age of 75 years and older has been found to correlate with failure to be continent by three months.^{16, 23, 24, 25} This was at variance with other studies that found no relationship between age and urinary incontinence.^{18, 26, 27} Although urinary incontinence has been found to be more frequent in women than men¹⁶, some other studies reported no such correlation.^{18, 24, 25, 26, 27, 28}

There have been controversies regarding the role of risk factors of stroke in the development of urinary incontinence. While previous studies observed diabetes mellitus and hypertension to be important risk factors for the development of urinary incontinence¹⁶, earlier studies had observed that apart from atrial fibrillation which was common amongst patients with urinary incontinence, no statistically difference was found between incontinent and continent patients as regards cigarette smoking, alcohol, hypertension, diabetes mellitus and transient ischaemic attack.^{26, 27, 29} Urinary incontinence is predictive of stroke outcome than a reduced level of consciousness.^{9, 10} An association between symptoms of micturition and stroke subtypes has been reported. Patients with lacunar infarctions and posterior circulatory infarctions were more likely to regain continence than patients with total anterior circulatory infarctions with urinary incontinence.^{23, 26} Symptoms of poor bladder control were found to be more frequent in patients with anterior cerebral artery territory infarctions than posterior cerebral artery territory. Haemorrhagic stroke was commoner in patients with urinary incontinence than in continent patients and tended to be bigger in size.¹⁸

Urinary incontinence has been reported to be strongly linked with severe hemiparesis.^{25, 26, 27} A significant correlation between urinary incontinence and size of lesion was observed in five studies. Lesions with urinary incontinence were commonly larger in size.^{4, 13, 16, 18, 27}

An association between bladder dysfunction and site of stroke was also reported. Urinary incontinence occurred more frequently in patients with combined cortical and sub-cortical strokes than in either.¹⁸ Gelber et al found the presence of aphasia to be strongly associated with the onset of urinary incontinence. The percentage of incontinent patients that had aphasia was 74% compared to 31% of the continent patients that were aphasic. Aphasic patients were found to be 2.3 times more prone to developing incontinence than non-aphasic patients.¹⁸ However, some other studies did not find any relationship between aphasia and urinary incontinence.^{26, 28}

There is an association between discharge destination and urinary incontinence. In a previous study carried out by Ween et al, 64% of incontinent patients were discharged to nursing homes compared to 18% for continent patients.²⁷ Other studies had also reported a higher frequency of incontinent patients that were discharged to nursing homes at various times.^{23, 24, 26, 28} However one study found no difference in the discharge destination between the incontinent and continent patients. Sixty-four percent of the patients without incontinence and 42% of the patients with urinary incontinence were sent to their own homes.³⁰

Functional status of patients assessed using Barthel index was found to be lower in incontinent patients. Gelber et al reported on the modified Barthel index scores to be 20.8 and 38 for incontinent and continent patients respectively.¹⁸ This finding was also in agreement with a study carried out by Kuijk who also found a lower modified Barthel index score among incontinent patients.²⁸

IV. Management

Not much of research has been done on improvement of urinary incontinence in stroke survivors. Making a clinical diagnosis should be the first step in order to base specific management such as retraining of the bladder and anticholinergic drugs in urge incontinence. Non-urological factors that can aggravate incontinence such as deficiency of estrogen in post-menopausal women, polyuria either from drugs or diabetes mellitus, psychological causes should be sought for and excluded.⁷

Thomas and colleagues³¹, after assessing 724 participants, in an attempt to ascertain the optimal methods for the treatment of urinary incontinence after stroke, suggested that professional input through structured assessment and management may help in reducing urinary incontinence post stroke. Different forms of interventional treatments were assessed. Three of the trials assessed behavioural methods like timed voiding and training of the pelvic floor muscle. Other interventions reported were on the use of acupuncture as a form of therapy; drugs such as oxybutinin and estrogen; but the study concluded that the available data were insufficient to direct continence care of adults poststroke. Yet in another study, the instituted treatment of drug therapy, surgical intervention, catheterization and training of the bladder allowed over half to be continent and also improved urinary incontinence in another 38%.³²

Easy access to a bedpan or urinal should be made available to patients who have restricted mobility or expressive aphasia. This is because these patients may have normal behavior and sensation of the bladder but have incontinence due to restricted access to facilities.

V. Discussion

Bladder dysfunction is an uncomfortable and incapacitating problem with major consequences for the quality of life post-stroke. Post-stroke bladder dysfunction has been shown to be a strong predictor of survival and recovery. The severity of stroke has been associated with a greater likelihood of developing urinary

incontinence.³³ In particular, urinary incontinence has been found to have a strong prognostic outcome than depressed level of consciousness in the first seven days of stroke.

The prefrontal cortex has connections directly with the periaqueductal grey and has been found to respond abnormally weakly to bladder filling in patients who have poor bladder control.³⁴ Disruption of the suprapontine circuitry such as occurs in stroke takes away the tonic inhibitory control leading to a decrease in the bladder capacity and detrusor overactivity.³⁵ Lesions of the frontal lobe can lead to inability to suppress reflex detrusor contractions voluntarily, thereby leading to urinary incontinence. Urinary incontinence is a common consequence of acute stroke. The prevalence of urinary incontinence has been reported to vary from 30%-80%.^{11, 16, 18} Studies have demonstrated a decrease in the prevalence of urinary incontinence over time after acute stroke. Patel et al²⁶ noted the prevalence of urinary incontinence after stroke to be 40% on admission, 19% at 3 months, 15% at one year and 10% in two years. In another study, Borrie and colleagues²⁰ observed the prevalence of urinary incontinence to also decrease as time elapsed, 60% at seven days, 42% at one month and 29% at three months. It has been thought that the low prevalence of urinary incontinence after stroke may be due to the time of assessment, as a longer time frame has been found to correlate with a decrease in the prevalence rate.¹⁸ Inclusion of premorbid incontinent patients in some studies has a significant influence on the prevalence of urinary incontinence post-stroke.¹¹

An increasing age has been found to be independently linked with failure to re-attain continence by three months. Explanations for the correlation between increasing age and persistence of urinary incontinence post-stroke have been postulated. Firstly, physiological changes do occur in older age thereby predisposing to the development of urinary incontinence even though the aging process per se does not ordinarily lead to urinary incontinence.³⁶ The changes of decrease in the capacity of the bladder and increase in residual volume in older age are well known. Also, older people tend to have increased prevalence of comorbidities making them prone to developing urinary incontinence. Such comorbidities include increased rates of both benign and malignant prostatic hypertrophy in males, reduced bladder outlet and urethral resistance pressure because of lack of estrogen due to menopause in females, and increased rates of infections of the urinary tract in both males and females.³⁶ Lastly, increasing age is recognized to be associated with increased stroke severity and worse prognosis.²³

VI. Conclusion

This re-creation of awareness of urinary incontinence associated with stroke and identification of factors predicting its outcome will make clinicians to pay more attention to this condition. This is because urinary incontinence does not ordinarily attract much attention.

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