Influence of Lower Urinary Tract Dysfunction on Functional Status among Ambulant Stroke Survivors: A Pilot Study

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Abstract

Background: Stroke is one of the diseases affecting the nervous system which controls the lower urinary tract. Lower urinary tract dysfunction is a broad term of subjective urinary tract symptoms and may vary according to the course of disease. The presence of Lower urinary tract dysfunction is a negative prognostic indicator for a variety of health and rehabilitation outcomes across the spectrum of care. This study was carried out to find whether severity of lower urinary tract dysfunction has an influence on functional status among ambulant stroke survivors.

Methodology: 20 ambulant stroke survivors with the mean age of 68.55±8.02 were evaluated using Core Lower Urinary Tract Symptom Score to assess the severity of lower urinary tract dysfunction and Barthel Index to assess the functional status.

Conclusion: This pilot study found weak negative correlation (r=-0.26) between Core lower urinary tract symptom score and functional status; however it was found to be statistically non-significant (p>0.05).

***Key words**: Barthel index, Lower urinary tract dysfunction, Stroke*

Introduction

Stroke is one of the diseases affecting the nervous system which controls the lower urinary tract.[1] Estimates of the prevalence of stroke in India range from 44 to 843 per 100,000 population.[2] Age is an important non-modifiable risk factor for stroke. The mean age of stroke onset in the South Asian region for example, 63 years in India is lower than in Western countries.[3]

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Lower urinary tract dysfunction (LUTD) is a broad term of subjective urinary tract symptoms such as nocturia, urgency, urinary incontinence and frequency of voiding, defined by the International Continence Society.[1]Lesions in the anteromedial frontal lobe, paraventricular white matter, and putamen are most often associated with LUTD[4]. A cross sectional study by Tibaek S in 2008 has reported the prevalence of atleast one symptom of LUTD in patients with stroke to reach up to 94 %[5]. At 4weeks and 1 year after stroke, a 43.5-53% and 32-37.7% prevalence of urinary incontinence, respectively has been reported .[6,7]

Problems associated with LUTD may vary according to the course of disease. Apart from having significant effects on sleep, daily activities, social life, and relationships; bladder dysfunction has also

been reported to be a predictor of poor functional status.[7]LUT symptoms can have a detrimental effect on the daily activity and health related Quality Of Life(QOL)of stroke patients.[8]LUTD is associated with poor functional recovery. [9] It has been reported that urinary incontinence after stroke is associated with a higher mortality.[8,10] Stroke has differing effects on cognitive, sensory, motor, and autonomic functions. Stroke leads to negative impacts on many components of functioning [11].

The prevalence estimates of other urinary symptoms such as urgency, day time, and night time frequency are also important. However the precise profile of lower urinary tract symptoms among patients with chronic stroke is still unclear according to a study by

Miyazato M in 2017.[12] Previous studies have mostly focused on the prevalence of urinary incontinence (UI) while other symptoms such as urgency, daytime frequency and nocturia are rarely reported and quantified.[7]

Assessment of severity and bother from symptoms is important, which leads to poor functional recovery and ultimately leading to poor functional status and medical help seeing behavior. Chronicity of problems related to the lower urinary system in these patients leads to infections, increases maintenance burden and risk of falling with limitations to social life, and depression.[13.] There are no similar studies which examine the severity of symptoms in Stroke patients. It will be important to assess and detailed information about a stroke patient's actual problems.[5]

There is a clear association between LUTD in particular nocturia, urinary urgency and urgency incontinence, and falls in older adults, with significant associated morbidity, mortality, and healthcare resource use. It is not clear, however, to what extent this relationship is due to falls and LUTD having a common cause, and how much is due to factors such as dual tasking, activity restriction, and other, as yet unrecognised, mechanisms. There are little evidences supporting there being at least an element of "common cause"; that both LUTD and urinary incontinence are common in later life and very common among the frail.[14]The presence of LUTD is a negative prognostic indicator for a variety of health and rehabilitation outcomes across the spectrum of care. There is a need to acknowledge the strong association between bladder control problems, impairments outside the lower urinary tract, function and activity limitations, and rehabilitation outcomes.

Cross-sectional studies are often the first step in understanding the cause-and-effect relationship, and review of the literature clearly reveals that little is known about the influence of lower urinary tract dysfunction on functional status and mobility among ambulant stroke survivors.

Materials and Methods

Twenty, ambulant stroke survivors aged over 60 years and above, in sub acute to chronic recovery, and medically stable, referred by specialists to Physiotherapy in tertiary hospitals in Southern Karnataka were recruited for this study. Purposive sampling was adopted. The study was approved by the Institutional Ethics Committee. Consent was obtained from all participants in our study. Prior history of cerebrovascular disease, presence of a concurrent neurological disorder, presence of an acute systemic disease or a concomitant disorder which could affect urination problems, patients being incapable of answering question due to any reason were excluded.

The participants were given detailed information about the study, following which an informed consent form was signed by the participants.

To evaluate the severity of LUTD Core lower urinary tract symptom score (CLSS) questionnaire was used. It is a comprehensive questionnaire which covers the following 25 Lower urinary tract symptoms defined by the standardization report: increased daytime frequency, nocturia, urgency, urgency incontinence, stress incontinence, nocturnal enuresis, continuous incontinence, other types of incontinence, increased bladder sensation, reduced bladder sensation,

absence of bladder sensation, slow stream, splitting or spraying of the stream, intermittency, hesitancy, straining, terminal dribble, feeling of incomplete emptying, post-micturition dribble, bladder pain, urethral pain, vulval pain, scrotal pain (for men only), perineal pain, and pelvic pain. Symptoms are scored according to their frequency (0: never, 1: rare, 2: sometimes, and 3: often) and their severity (0: none, 1: slight, 2: moderate, and 3: severe). The frequency of voiding is scored as follows: 0 (7 times), 1 (8–10 times), 2 (11–14 times), 3 (15 times) for the daytime, as well as 0 (0 times), 1 (1 time), 2 (2–3 times), and 3 (4 times) for the night time. Each subject is asked to choose up to three symptoms that he/she considered to have a significant impact on daily life.[18] The results of 10 questions were summed, and the total score is reported from 0-30.with higher scores signifying higher severity in LUTD .The questionnaire is found to be reliable to assess lower urinary tract symptoms in patients with chronic stroke as per the study concluded byMiyazato et.al in 2016.[12]

Functional status was then evaluated using Barthel Index . It includes 10 fundamental items of ADL: feeding, grooming, bathing, dressing, bowel and bladder care, toilet use, ambulation, transfers, and stair climbing. The total score ranges from 0 to 20, with higher scores signifying better degrees of function.[15]

Mean and standard deviation was used to summarise quantitative data. Karl Pearson's correlation coefficient was used to test the influence of Lower urinary tract dysfunction on Functional status and mobility among ambulant stroke survivors; p value less than 0.05 was considered significant of this study.

Results and Discussion

Most 12 (60%) of the individuals were in the age group of 60 to 69years (Figure 1).Majority of the study participants 16(80%) were males.(Figure 2) Mean age of 20 participants was 68.55±8.02 with range of 60-90 years .Mean CLSS of 20 participants was 12.85±2.30with range of 8-18 .Mean BI of 20 participants was 69.25±7.304. From Karl Pearson's correlation coefficient, it was observed that weak negative correlation (r=-0.26) exists between CLSS and BI but it was statistically non-significant (p>0.05) (Table 1)

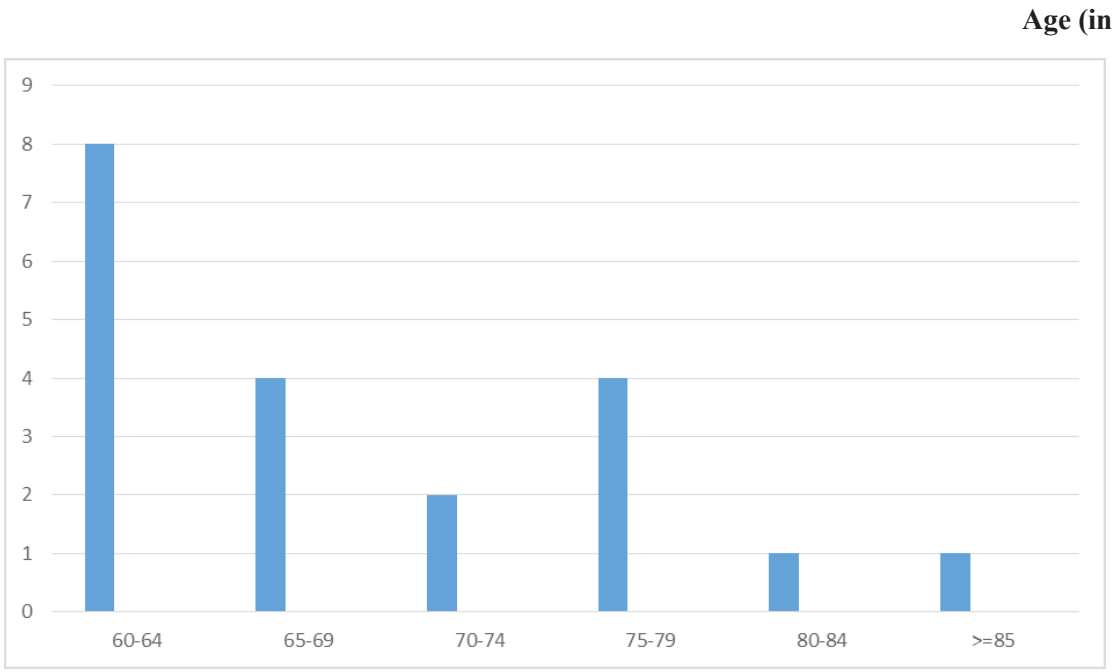

Fig 1: Age wise distribution of participants.

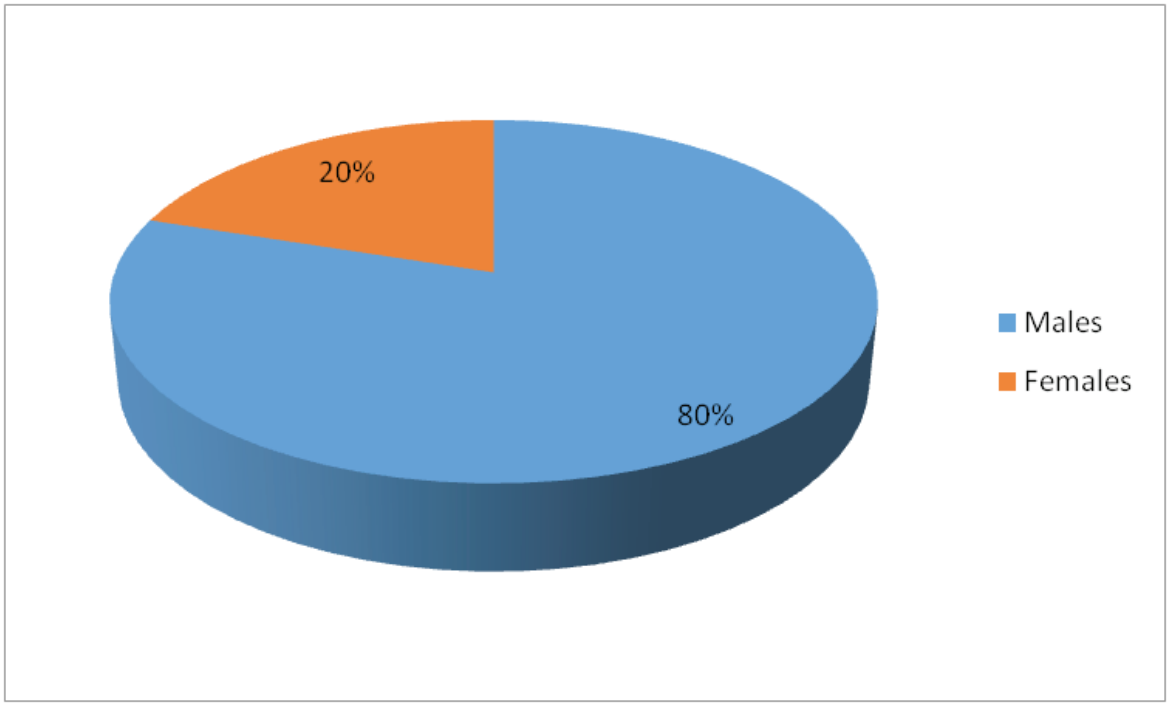

Fig 2:-Gender wise distribution of participants

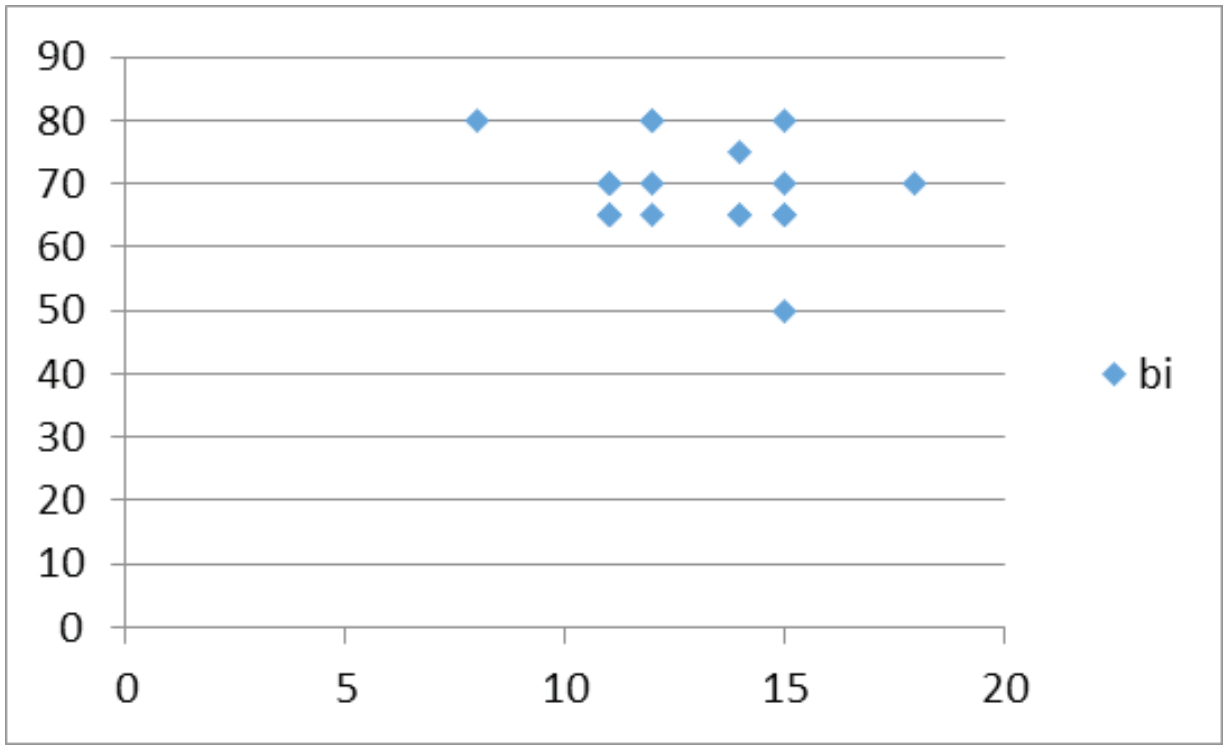

Fig 3:-Correlation of CLSS with BI

Table 1: Correlation of CLSS with BI

		bi	
CLSS	Pearson Correlation	-.258	
	Sig. (2-tailed)	.273	
	N	20	

Several disorders and conditions affecting the nervous system which controls the lower urinary system may result in neurogenic LUTD. Stroke is one of these conditions and it can further increase the problem of LUTD which is common in the aging population. There is a large spectrum of post-stroke urinary symptoms varying from incontinence to retention.[4]The prevalence varies according to the time after stroke [5]. Urinary incontinence, which has recently been recognized as the most common of these symptom, is noteworthy and its prevalence ranges between 40 and 60% .[16]

LUT symptoms can have a detrimental effect on the daily activity and Quality Of Life of stroke patients. Hence this study was carried out to find whether LUTD has an influence on functional status.

Our study demonstrated only a weak negative correlation between severity of lower urinary tract dysfunction (LUTD) and functional status (Barthel Index). In contrast to our results, several studies indicate that urinary retention after stroke is strongly associated with functional status. Akkoc Y et.al found that, LUTD was very common and was also associated with a poor cognitive, functional status in stroke patients with LUTD[13]. Similarly In a longitudinal study including 752 stroke patients, KolominskyRabas PL et al. reported that the Barthel Index scores of those with UI after a period of 12 months were significantly lower and these patients were more confined to the home [7]. In another study by Patel et.al, the effect of post-stroke UI on disability was evaluated and those with persistent UI, irrespective of other factors, were associated with poor clinical outcomes, compared to those without UI[8].. Kong and Young reported that urinary retention is strongly associated with poor functional status and explained that patients with lower functional status are likely to be bedridden [17]. Son SB et.al found that, Urinary retention in post-stroke patients is significantly related to the poor functional status at initial stage of rehabilitation, and also to poor recovery after rehabilitation.[18]

In patients with stroke, urinary retention due to decreased detrusor activity, frequent urination, nocturia, urinary urgency, and urgency-type UI due to increased detrusor activity may be seen[19]. Lower urinary tract dysfunction is a common problem and its frequency ranges from 80 to 90%, depending on the period following stoke. However, studies have shown that the most frequently examined LUTD parameters include UI and urinary retention, whereas the prevalence rates of the other important LUTD complaints such as urgency, pollakiuria, nocturia have not been clearly understood, yet [5].

Several limitations of this study should be considered. Firstly, the sample size was small. Thus further confirmation of these results must be done in a larger population for the generalization of the results. Second, present study population had subjects with both sub acute phase of recovery(15%) and chronic phase of recovery(85%). Studies have indicated that severity of LUTD and functional status are influenced by stage of recovery. This might have influenced the results.

Conclusion

This pilot study found a weak negative correlation between severity of lower urinary tract dysfunction and functional status.

LIST OF ABBREVATIONS

CLSS- Core Lower Urinary Tract Symptom Score

LUTD- Lower Urinary Tract Dysfunction

BI- Barthel Index

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Ethical clearance has been obtained from the Institutional Ethics Committee.

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