

SHORT COMMUNICATION

PREVALENCE OF INCONTINENCE IN PATIENTS AFTER STROKE DURING REHABILITATION: A MULTI-CENTRE STUDY

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Objective: To report the prevalence and degree of isolated urinary and faecal incontinence and double incontinence (i.e. both urinary and faecal incontinence) in patients after stroke during post-acute rehabilitation and the factors related to incontinence.

Design: A multi-centre prospective study.

Methods: Data were extracted from the Thai Stroke Rehabilitation Registry. A total of 185 patients admitted within 4 weeks post-stroke were recruited. Based on the Barthel Index of Activities of Daily Living, the prevalence and degree of isolated urinary incontinence or faecal incontinence, and double incontinence were reported. Multivariate analysis was performed to identify any factors related to incontinence.

Results: The admission prevalence for isolated urinary incontinence was 12.4%, for isolated faecal incontinence 7.6% and for double incontinence 33%. At discharge, the prevalence had decreased, to 8.1% for isolated urinary incontinence, 4.9% for isolated faecal incontinence and 15.1% for double incontinence. Cognitive (adjusted odds ratio (OR) 3.63; 95% confidence interval (CI) 1.71–7.70) and leg muscle functions impairments (adjusted OR 2.79; 95% CI 1.29–6.07) were significantly related to urinary incontinence; whereas, age (adjusted OR 1.98; 95% CI 1.07–3.67) was related to faecal incontinence at admission.

Conclusion: Double incontinence was more prevalent than isolated incontinence in patients after stroke during post-acute rehabilitation. The decrease in prevalence at discharge reflected a recovery of bladder and bowel control. Age, cognitive and leg motor function impairments were related to incontinence.

Key words: stroke, urinary incontinence, faecal incontinence, epidemiology, rehabilitation.

J Rehabil Med 2009; 41: 489–491

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Submitted July 15, 2008; accepted December 18, 2008

INTRODUCTION

Urinary incontinence (UI) is common after acute stroke. Brittain et al. (1) reviewed 9 studies published between 1985 and 1997 and showed that 32–79% of patients after stroke experienced UI on admission, reducing to 25–28% at discharge. Brocklehurst et al. (2) found in their study that initially 39% of 135 stroke survivors experienced UI, but this decreased to 12% at 6 months. According to the Copenhagen Stroke Study, acute assessment revealed 47% with UI, decreasing to 28% at discharge and 19% at 6 months (3). Borrie et al. (4) reported an initial UI rate of 60%, decreasing to 29% at 1 month, and 66% of those with mild UI at 1 month had become continent by 3 months (the study did note that 17% of the subjects may have had UI before their stroke, due to dementia, benign prostatic hypertrophy or stress UI). Regarding faecal incontinence (FI), prevalences of 23–56% have been noted in acute patients after stroke (2, 3, 5–7), 11–21% after 3 months or at discharge (3, 5, 6), and 9–22% at 6 months (3, 6).

To date, most studies reporting on incontinence in patients after stroke have tended to come from developed Western countries, and none cover isolated UI, isolated FI or double incontinence (DI) (i.e. having both UI and FI) during rehabilitation admission. The objectives of this study, therefore, are to report the prevalence and degree of isolated UI, FI and DI in Thai patients after stroke on admission to rehabilitation and at discharge, and to investigate the factors that might relate to incontinence.

METHODS

Due to the wide range of onset conditions of stroke prior to the admission interval of patients in the Thai Stroke Rehabilitation Registry (TSRR) (8), only those admitted within a 4-week period post-stroke were selected for investigation of their prevalence of incontinence in the early post-acute rehabilitation state. The inclusion criteria used for the patients after stroke in the TSRR were: age > 18 years, stable vital signs for 48 h, able to follow at least a 1-step verbal command, and had never received a comprehensive rehabilitation programme (8).

Definitions of incontinence were based on the Barthel Index of Activities of Daily Living (BI ADL) of bladder and bowel: score 0: incontinent (or severe); score 1: occasional accident (or mild); once a

Table I. Prevalence of incontinence at admission and discharge from rehabilitation post-stroke

Degree	Prevalence of incontinence (%)									
	Isolated UI		Isolated FI		DI		Overall UI		Overall FI	
	Adm	Disch	Adm	Disch	Adm	Disch	Adm	Disch	Adm	Disch
Severe	3.78	2.16	2.70	0.54	8.10	1.62	15.14	4.86	16.22	3.24
Moderate					8.65	2.16				
Mild	8.65	5.95	4.87	4.32	16.22	11.35	30.27	18.38	24.32	16.76
Total	12.43	8.11	7.57	4.86	32.97	15.13	45.41	23.24	40.54	20

UI: urinary incontinence; FI: faecal incontinence; DI: double incontinence; Overall: (combined isolated and double incontinence) UI and FI; Adm: admission to rehabilitation; Disch: discharge from rehabilitation.

week for bowel and maximum once per 24 h for bladder); and score 2: normal (9). If a patient had only UI or FI, it was counted as isolated UI or FI; and having both UI and FI as DI (mild: occasional of both UI and FI; moderate: mixed incontinent and occasional UI and FI; and severe: incontinent of both UI and FI). The prevalence and degree of isolated UI, isolated FI and DI were reported as percentages. Multivariate analysis was used to investigate the correlations between incontinence and factors such as age (>60 years), sex, diabetes, hypertension, dyslipidaemia, heart diseases, previous stroke, type of stroke, onset-admission interval (weeks), cognitive impairment (Thai Mini-Mental State Examination score <24), leg muscle functions impairment (admission Brunnstrom's leg motor recovery stage 1-3) and functional limitation (admission BI ADL score ≤12).

RESULTS

A total of 185 patients after post-acute stroke were recruited to this study. Demographic data were as follows: 42.7% females, mean age 62.3 years (standard deviation (SD) 12.7), 21.6% cerebral haemorrhage, 49.7% cognitive impairment, 92.4% functional limitations at admission, mean onset to admission interval 1.9 weeks (SD 1.1), mean length of stay 3.6 weeks (SD 2.0) and 47% had normal bladder and bowel control at admission. Table I shows prevalence of isolated UI, isolated FI, DI and overall incontinence (combined isolated and double incontinence) at admission and discharge. After rehabilitation, a decrease was noted in all prevalences. Additionally, 34.4% of

those with DI on admission regained bladder and bowel control, while 9.8% ended with isolated FI, 13.1% with isolated UI at discharge but 42.6% still had DI.

Regarding any relationships between the above-mentioned factors and the admission prevalence, age and functional limitations seemed to be related to FI; while age, cognitive and leg muscle functions impairments and functional limitation were related to UI (see Table II). After multivariate analysis, cognitive (adjusted OR 3.63; 95% CI 1.71-7.70) and leg muscle functions impairments (adjusted OR 2.79; 95% CI 1.29-6.07) were significantly related to UI; whereas only age (adjusted OR 1.98; 95% CI 1.07-3.67) related to FI at admission. No single factor was significantly related to the discharge prevalence of UI and FI.

DISCUSSION

Isolated UI was found to be more prevalent than isolated FI, both on admission to rehabilitation and at the end of rehabilitation. The prevalence of DI was approximately 3 times greater than isolated UI and 4 times greater than isolated FI. At discharge the prevalence of DI had decreased to approximately half, and approximately one-third of those with DI at admission had regained normal bladder and bowel control by discharge.

Table II. Univariate analysis of independent variables related to faecal and urinary incontinence on admission to rehabilitation

Related factors	Faecal incontinence (n=185)			Urinary incontinence (n=185)		
	Yes	No	p-value	Yes	No	p-value
Age, years (>60/<60)	50/25	55/55	0.025*	55/29	50/51	0.029*
Sex, female/male	29/46	50/60	0.359	37/47	42/59	0.736
Diabetes, yes/no	18/57	30/80	0.618	20/64	28/73	0.545
Hypertension, yes/no	51/24	82/28	0.331	59/25	74/27	0.648
Dyslipidaemia, yes/no	44/31	61/49	0.665	46/38	59/42	0.617
Heart disease, yes/no	11/64	18/92	0.755	14/70	15/86	0.735
Type of stroke, infarction/haemorrhage	60/15	85/25	0.658	69/15	76/25	0.257
Previous stroke, yes/no	4/71	13/97	0.195	9/75	8/93	0.513
TMSE score (n=160) (≤23/>23)	39/23	53/45	0.271	53/15	39/53	<0.001*
Brunnstrom's recovery stages (1-3 vs 4-6)						
Arm	56/19	81/29	0.875	66/18	71/30	0.201
Hand	55/20	79/31	0.821	63/21	71/30	0.476
Leg	55/20	71/39	0.208	67/17	59/42	0.002*
Barthel Index score (≤12/>12)	73/2	98/12	0.047*	83/1	88/13	0.004*

*p<0.05

TMSE: Thai Mini-Mental State Examination.

When reporting UI or FI, previous studies (1–6) did not consider co-existing FI or UI. Combining isolated UI with DI (overall UI), 45.4% of our patients after stroke were found to have had UI at admission and this prevalence decreased to approximately half one month after admission (see Table I). This prompts us to recognize that incontinence occurring after a stroke is usually transient.

Our prevalence figures for UI were quite comparable with previous reports (1, 3). However, severe UI was less prevalent than mild UI, while in the Copenhagen Stroke Study the prevalence of severe UI was 3 times that of mild UI (3). This may be due to 93% of the patients in the Copenhagen study being admitted within the first week after a stroke attack when the patients' conditions might not have been stable, and they needed catheterization.

When combining isolated FI with DI, our admission prevalence of overall FI was 40.5%, (see Table I), which is similar to the acute admission prevalence of FI in the Copenhagen study (40%) (3) and less than the prevalence of new-onset FI after stroke at rehabilitation admission (56%) reported by Baztan et al. (6). At discharge our FI prevalence had decreased to 20%, similar to the discharge prevalence (21.1%) reported by Baztan et al. (6).

According to the Copenhagen Stroke Study of unselected patients after acute stroke (3), significant risk factors associated with UI and FI were age, severity of stroke, diabetes, and co-morbidity of other disabling diseases. However, we found that only age was significantly related to FI, whereas cognitive and leg motor functions impairments were significantly related to UI at admission. No factors were related to incontinence at discharge.

Overall, DI was more prevalent than isolated incontinence. After post-acute rehabilitation, approximately half of patients regained bladder and/or bowel control. Based on the BI ADL

definitions of bladder and bowel control, the prevalence of UI and FI in this study was comparable to those reported in the Copenhagen study.

ACKNOWLEDGEMENTS

Our grateful thanks are extended to the Royal College of Psychiatrists of Thailand and the Thai Rehabilitation Medicine Association for their initiative; to the Clinical Research Collaboration Network for the research grant; and to all site co-ordinators for data collection.

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