Swallowing Problem in Patients with Stroke: Multi-Center Study in Thailand

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Background: *Swallowing problems are a common symptom in patients suffering from stroke. The severity of swallowing problems associate with age, stroke types, and brain lesion. Early recognition of the problem can prevent complications such as aspiration pneumonia, and malnutrition.*
Objective: *To report the prevalence and the long-term outcome of dysphagia in patients with stroke.*
Material and Method: *Data of patients with stroke admitted at nine rehabilitation wards/centers in Thailand were extracted from the Thai Stroke Rehabilitation Registry (TSRR) I and II (1-year follow-up).*
Results: *Of 327 stroke patients [mean age 62 (SD 12) years and male: female = 193:134], 49 (15%) had swallowing dysfunction at admission. Dysphagic patients had significantly more cognitive impairment (TMSE score <24) than non-dysphagic group (p = 0.01). There was no significant difference in age, gender, onset-admission interval, type of stroke, and modified Barthel Index score (mBI) between the two groups. Moreover, there was no relationship between dysphagia and poor functional outcome (mBI ≤12). One year after discharge, only 214 (65.4%) patients returned for follow-up and seven patients (3.27%) had swallowing problem.*
Conclusion: *After a stroke attack, about 15% of patients had swallowing dysfunction. Those with cognitive impairment at admission were more prone to swallowing functions impairment.*

Keyword: *Dysphagia, Stroke, Rehabilitation*

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Approximately 39 to 55% of patients suffered from stroke experienced with swallowing disorder[1-3] which increases mortality rate, cost, and length of stay. Furthermore, silent aspiration is common in stroke patient, about 40 to 70% were reported[3-5]. Most of stroke patients can recover to normal swallowing function within seven days, only 10% have the persistent dysphagia lasting more than 14 days[2,7,8]. For such patients, gastrostomy tube placement should be considered to improve nutrition. Broadley et al[2] found that patient who has abnormal water swallow test and any two of the following features: Barthel index score <20, dysphagia scores <70, dysphasia, involvement of frontal, and insula cortex need gastrostomy feeding. In addition, bilateral stroke, aspiration which documented by videofluoroscopic examination and more than 53 years of age are poor prognostic factor for recovery in swallow function[9]. Although there are many studies about prevalence of swallowing problem in stroke as well as prognostic factor, there is no study about prevalence and long term outcome in Thailand. Therefore, this study aimed to report the prevalence of dysphagia in stroke patients in Thailand. This study aimed to report the prevalence

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and long term outcome (1 year after discharge from rehabilitation ward) of swallowing problem in stroke patients in Thailand.

Material and Method

Data were gathered and analyzed from Thai Stroke Rehabilitation Registry (TSRR) I-II which recruited 327 stroke patients in nine tertiary in-patient rehabilitation settings in Thailand. All stroke patients who met the inclusion criteria (age ≥18, stable vital sign at least 48 hours, able to follow commands, able to participate rehabilitation program and able to maintain in upright position at least 30 minutes) were recruited. The patients who had unstable medical condition, history of psychiatric disorder for example schizophrenia and other disability such as blindness, amputation were excluded. All participants were assessed at admission and one year after discharge. Data were collected and analyzed using SPSS program, Chi-square and t-test were used to compare categorical and continuous data. For modified Barthel Index scale, Wilcoxon sign rank test was used to compare between groups. Multivariate logistic regression was used to identify the factor related with dysphagia.

Results

Of 327 stroke patients, mean age 62 (SD12) years, 49 (15%) had swallowing disorder on the admission. Demographic data of subjects were shown in Table 1. For dysphagic patients, there were significantly more cognitive dysfunctions (based on Thai Mental State Examination (TMSE) score <24) than non-dysphagic group (p = 0.014). Furthermore, there was lower modified Barthel Index score (mBI) at admission in dysphagic group than non-dysphagic group. Whereas, there was no significant difference in age, gender, onset-admission interval, and type of stroke between the two groups (Table 2). During hospitalization, three patients (6.12%) developed pneumonia, all of them were cured. Thus, there was no difference in total hospital expenses between the two groups. Average costs for dysphagic group and non-dysphagic group were 26,625.92±27,434.88 baht and 26,968.77±21,405.77 baht respectively.

One year after discharge, only 214 (65.4%) patients were completed the study, seven patients (3.27%) had swallowing problem. Of the seven patients with swallow problem, two patients used nasogastric tube feeding and two patients used gastrostomy feeding. Characteristics of those patients were shown in Table 3. Although there was lower mBI score in prolonged dysphagic group, no statistical significant difference was detected. There was no association among visual neglect, aphasia, side of weakness, stroke type, history of previous stroke, age, and prolonged swallowing disorder. During 1-year follow-up period, there was one patient suffering from pneumonia.

Table 1. Demographic data of stroke patients (n = 327)

Item	n	Percent
Gender		
Male	193	59.02
Female	134	40.98
Marital status		
Single	23	7.03
Married	239	73.09
Divorced/separate/widowed	65	19.88
Education		
No education	18	5.51
Primary school	174	53.21
Secondary school	55	16.82
Technical school	18	5.51
Bachelor degree or higher	58	17.73
Other	4	1.22
Underlying disease		
Diabetes	87	26.61
Hypertension	245	74.92
Dyslipidemia	178	54.43
Cardiac disease	59	18.04
TIA	3	0.92
Previous stroke	48	14.68
Other	52	15.90
No underlying disease	20	6.12

Discussion

This study showed about 15% of stroke patients reporting swallowing disorder and seven out of 214 (3.27%) patients with dysphagia had persistent swallowing problem at one year follow-up. Our study suggested that visual neglect, left side weakness, and impaired cognitive function were associated with dysphagia. However, no factor relating prolonged swallowing problem (at one year after discharge) was found.

Brodley S. et al[2] found that 50% of acute stroke patients had the swallowing problem and almost half of these were transient dysphagia. For our study, swallowing disorder was diagnosed using only clinical assessment such as choking during swallow and water swallow test, therefore, silent aspiration or mild case of dysphagia could not be detected. Furthermore, we

Table 2. Comparison between dysphagic and non-dysphagic group

Item	Dysphagia		*p*-value
	Yes	No	
Gender (male/female)	34/15	159/119	0.110
Age (mean ± SD)	63.73±12.32	61.98±12.10	0.351
Previous stroke (yes/no)	9/40	39/239	0.429
Type of stroke (infarction/hemorrhage)	41/8	193/85	0.122
Weakness (Lt/Rt/bilateral)	22/21/5	154/121/2	<0.0001*
Aphasia (yes/no)	14/33	55/220	0.094
Visual neglect (yes/no)	4/28	19/230	<0.0001*
mBI on admission (median (IQR))	4 (2-8)	8 (5-10)	<0.0001*
TMSE (≤23, >23)	30/10	138/116	0.014*
Hospital length of stay (weeks) (mean ± SD)	4.04±2.20	4.44±2.54	0.26

mBI = modified barthel index score, IQR = interquartile range, TMSE = Thai minimental state examination

Table 3. Characteristics of patients with prolonged dysphagia (at 1 year follow-up period)

No.	Age	Sex	Type of stroke	Weakness side	MBI at admission	History of previous stroke	Aphasia
1.	77	F	Infarction	Rt	1	No	Yes
2.	59	M	Infarction	Bilateral	11	No	No
3.	72	F	Infarction	Rt	10	No	No
4.	43	M	Infarction	Rt	3	No	Yes
5.	54	M	Infarction	Rt	4	No	Yes
6.	71	M	Infarction	Lt	4	No	No
7.	57	F	Hemorrhage	Lt	2	No	No

conducted study in the subacute phase, thereby transient dysphagia was not included in our result. Hence, prevalence of dysphagia in stroke patients from this study was less than other studies[1-3,10-12].

Overall, 6% developed aspiration pneumonia during hospitalization. Similarly, Kitisomprayoonkul et al[13] reported medical complication during inpatient stroke rehabilitation, 5% of stroke patients experienced pulmonary aspiration. For this result, only using clinical assessment could identify the risk of aspiration. However, videofluoroscopic examination is the gold standard for dysphagia evaluation and could give us more information about swallowing pattern and silent aspiration.

Smithard[12] found the correlation of dysphagia not only with low median Barthel index score at six months after stroke but also prolonged hospital length of stay. Moreover, the patients with dysphagia were more likely to be discharged to institutionalized care. Paciaroni et al[14] confirmed the relationship between dysphagia and mortality and disability rate at three months. On the contrary, this study showed no significant difference in hospital length of stay. For our study, there was few incidence of aspiration pneumonia, therefore there was no difference in length of stay and hospitalization cost between both groups. There was low admission mBI in dysphagia group, but that did not associate with poor functional outcome at discharge (after adjusted for admission score); there was no relationship with mBI score at one year after discharge. As the study of Smithard et al[15] mentioned although the presence of dysphagia was associated with increased mortality rate, they did not find the relationship between dysphagia and mBI. Han DS et al[16] followed the stroke patients for 10 years and found that dysphagia was not the important factor of post stroke patients. There was no contradiction regarding the association between dysphagia and poor outcome in short-term period, but it is still inconsistent for long-term period.

Although, many studies reported the predictor for swallowing function recovery, few studies

determined the factor associated prolonged dysphagia that fail to recover within one year. Broadley[2] found that age greater than 70, Barthel index and lesion at frontal cortex associated with prolonged dysphagia. The result of this study showed no correlation between gender, history of previous stroke, age, stroke type, side of weakness, visual neglect, and aphasia with dysphagia at 1-year follow-up period. For the long term follow-up, more than 20% of participants did not complete the study, in addition, we had only seven stroke patients with swallowing problem, so the association between each factor could not be found. Moreover, we did not examine the lesion size and location which affected swallow function and aspiration[18]. This study did not evaluate the patient in acute phase, so we lacked the information in acute phase. Furthermore, each institute used the different kind of clinical assessment, this may affect the prevalence of dysphagia.

Conclusion

Fifteen percent of stroke patients had swallowing problem and 3 % had persistent swallowing dysfunction (at 1 year follow-up). Further study will be needed to evaluate the predictor for prolonged dysphagia and to determine the effect of dysphagia on long term functional outcome.

What is already known on this topic?

The swallowing problem is common problem in stroke patients. Many studies reported the prevalence of dysphagia, which varied according to the assessment method. To the best of our knowledge, however, the prevalence of swallowing problem in stroke patients in Thailand has not been reported.

What this study adds?

About 15% of stroke patients experienced swallowing disorder and seven out of 214 (3.27%) patients with dysphagia had persistent swallowing problem at one year follow-up. The study suggested that visual neglect, left side weakness, and impaired cognitive function were associated with dysphagia.

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Potential conflicts of interest

None.

References

1. Odderson IR, Keaton JC, McKenna BS. Swallow management in patients on an acute stroke pathway: quality is cost effective. Arch Phys Med Rehabil 1995; 76: 1130-3.
2. Broadley S, Croser D, Cottrell J, Creevy M, Teo E, Yiu D, et al. Predictors of prolonged dysphagia following acute stroke. J Clin Neurosci 2003; 10: 300-5.
3. Daniels SK, Brailey K, Priestly DH, Herrington LR, Weisberg LA, Foundas AL. Aspiration in patients with acute stroke. Arch Phys Med Rehabil 1998; 79: 14-9.
4. Splaingard ML, Hutchins B, Sulton LD, Chaudhuri G. Aspiration in rehabilitation patients: videofluoroscopy vs bedside clinical assessment. Arch Phys Med Rehabil 1988; 69: 637-40.
5. Smith CH, Logemann JA, Colangelo LA, Rademaker AW, Pauloski BR. Incidence and patient characteristics associated with silent aspiration in the acute care setting. Dysphagia 1999; 14: 1-7.
6. Daniels SK, Ballo LA, Mahoney MC, Foundas AL. Clinical predictors of dysphagia and aspiration risk: outcome measures in acute stroke patients. Arch Phys Med Rehabil 2000; 81: 1030-3.
7. Zorowitz RD, Gross E, Polinski DM. The stroke survivor. Disabil Rehabil 2002; 24: 666-79.
8. Mann G, Hankey GJ, Cameron D. Swallowing function after stroke: prognosis and prognostic factors at 6 months. Stroke 1999; 30: 744-8.
9. Ickenstein GW, Kelly PJ, Furie KL, Ambrosi D, Rallis N, Goldstein R, et al. Predictors of feeding gastrostomy tube removal in stroke patients with dysphagia. J Stroke Cerebrovasc Dis 2003; 12: 169-74.
10. Crary MA, Carnaby-Mann GD, Miller L, Antonios N, Silliman S. Dysphagia and nutritional status at the time of hospital admission for ischemic stroke. J Stroke Cerebrovasc Dis 2006; 15: 164-71.
11. Suntrup S, Kemmling A, Warnecke T, Hamacher C, Oelenberg S, Niederstadt T, et al. The impact of lesion location on dysphagia incidence, pattern and complications in acute stroke. Part 1: dysphagia incidence, severity and aspiration. Eur J Neurol 2015; 22: 832-8.
12. Smithard DG, O'Neill PA, Parks C, Morris J. Complications and outcome after acute stroke.

Does dysphagia matter? Stroke 1996; 27: 1200-4.
13. Kitisomprayoonkul W, Sungkapo P, Taveemanoon S, Chaiwanichsiri D. Medical complications during inpatient stroke rehabilitation in Thailand: a prospective study. J Med Assoc Thai 2010; 93: 594-600.
14. Paciaroni M, Mazzotta G, Corea F, Caso V, Venti M, Milia P, et al. Dysphagia following Stroke. Eur Neurol 2004; 51: 162-7.
15. Smithard DG, Smeeton NC, Wolfe CD. Long-term outcome after stroke: does dysphagia matter? Age Ageing 2007; 36: 90-4.
16. Han DS, Pan SL, Chen SY, Lie SK, Lien IN, Wang TG. Predictors of long-term survival after stroke in Taiwan. J Rehabil Med 2008; 40: 844-9.
17. Steinhagen V, Grossmann A, Benecke R, Walter U. Swallowing disturbance pattern relates to brain lesion location in acute stroke patients. Stroke 2009; 40: 1903-6.

ความชุกของภาวะกลืนลำบากในผู้ป่วยโรคหลอดเลือดสมอง: การวิจัยแบบพหุสถาบันในประเทศไทย

ภัทรา วัฒนพันธุ์, อภิชนา โมวินทะ, วุฒิชัย เพิ่มศิริพานิช, ณัฐเศรษฐ มนิมนากร, วิไล คุปตนิรัติศัยกุล

ภูมิหลัง: *ปัญหาด้านการกลืนเป็นภาวะที่พบบ่อยในผู้ป่วยโรคหลอดเลือดสมอง โดยความรุนแรงของอาการสัมพันธ์กับอายุ ชนิด และรอยโรคของโรคหลอดเลือดสมอง การตรวจพบภาวะกลืนลำบากเร็วจะสามารถป้องกัน การเกิดภาวะแทรกซ้อน เช่น ปอดอักเสบติดเชื้อและทุโภชนาการได้*

วัตถุประสงค์: *เพื่อรายงานความชุกของภาวะกลืนลำบากและผลระยะยาวในผู้ป่วยโรคหลอดเลือดสมอง*

วัสดุและวิธีการ: *ศึกษาข้อมูลผู้ป่วยโรคหลอดเลือดสมองจากการศึกษา Thai Stroke Rehabilitation Registry (TSRR) I and II (1 year follow-up) ซึ่งเข้ารับการฟื้นฟูสภาพที่หอผู้ป่วยและศูนย์ฟื้นฟูภาพ 9 แห่งในประเทศไทย*

ผลการศึกษา: *ผู้ป่วยโรคหลอดเลือดสมอง 327 ราย [อายุเฉลี่ย 62 (SD 12) ปี ชาย: หญิง = 193:134], 49 (ร้อยละ 15) มีภาวะกลืนลำบากวันแรกรับเข้ารักษา โดยกลุ่มผู้ป่วยที่มีภาวะกลืนลำบากมีปัญหาด้านการทำงานของสมอง (TMSE score <24) มากกว่ากลุ่มที่กลืนปกติ (p = 0.01). ไม่พบมีความแตกต่างกันของอายุ เพศ ระยะเวลาการเจ็บป่วยชนิดของโรคหลอดเลือดสมองและ modified Barthel Index score (mBI) ระหว่าง 2 กลุ่ม อย่างมีนัยสำคัญทางสถิติ นอกจากนี้ยังไม่พบว่ามีความสัมพันธ์กับภาวะการฟื้นตัวที่ไม่ดี (mBI ≤12) หลังจากการติดตามไป 1 ปี มีเพียง 214 ราย (ร้อยละ 65.4) มาติดตามการรักษาในกลุ่มนี้พบมีผู้ป่วย 7 ราย (ร้อยละ 3.27) มีปัญหาด้านการกลืน*

สรุป: *ภายหลังการเกิดโรคหลอดเลือดสมองผู้ป่วยประมาณร้อยละ 15 มีปัญหาด้านการกลืน กลุ่มที่มีการทำงานของสมองลดลงจะมีโอกาสเกิดความบกพร่องทางการกลืนได้*