Factors affecting adaptation outcome in post intracerebral haemorrhage patients: A preliminary study

Sabarisah Hashim[1], Vickneswaran Mathaneswaran[2], Khatijah Lim Abdullah[3], Aniza Abd. Aziz[4]

[1,2,3] University of Malaya, Kuala Lumpur, Malaysia
[2] Universiti Sains Malaysia, Kelantan, Malaysia

Sabarisah Hashim[1], PhD Candidate, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia, risha@kck.usm.my
Professor Dr. Vickneswaran Mathaneswaran [2], Lecturer, Department of Surgery (Neuro Surgery), Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia, cmvwaran@gmail.com
Assoc. Professor Dr. Khatijah Lim Abdullah[3], Department of Nursing Science, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia, katlim@um.edu.my
Aniza Abd. Aziz [4], Senior Lecturer, Unit of Biostatistics & Research Methodology, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, draniza@kk.usm.my

Abstract

BACKGROUND *Intracerebral haemorrhage (ICH) defined as the bleeding into the parenchyma of the brain that may be extend into the ventricles (Qureshi et al. 2001). Persons with ICH commonly experienced stroke related change or disability. Adaptation outcome after experiencing ICH is perceived as a patients respond to the stroke related changes and living with the change. A better understanding of the factors that affect process of adaptation is essential in planning specific stroke education and rehabilitation interventions.* ***PURPOSE*** *This study was aimed to determine stroke-related adaptation outcome in the rehabilitation phase and to determine factors affecting the adaptation outcome among ICH patients.* ***METHOD*** *This was part of a prospective study conducted at Hospital Universiti Sains Malaysia (HUSM) and Hospital Sultanah Nur Zahirah (HSNZ) Terengganu, Malaysia during July 2009 - July 2010. The study sample was patients admitted and diagnosed as having intracerebral haemorrhage evidenced on the initial CT scan during the study period.The instruments consisted of National Institutes of Health Stroke Scale (NIHSS), Complication Inventory Checklist (CIC), Functional Independence Measure (FIM) and Stroke Knowledge Checklist (SKC).* ***RESULTS*** *There were 80 subjects participated in this preliminary analysis. Their mean (SD) age was 56.0 (11.4) years and about 61.3 percent were males. The regression results revealed that factors significantly affect an adaptation outcome were Initial Adaptation (FIM 2 week), Age, Total depression 3 months, Urinary Infection 3 month post stroke, Shoulder pain 3 month post stroke, Family Caregiver, Deep vein trombosis 2 weeks post stroke were accounted about 75.2 percent (r = .867) of variance change in adaptation outcome (FIM 3 month).* ***CONCLUSION*** *The preliminary result revealed that a few demographic and clinical characteristic were found to affect adaptation outcome in post haemorrhage patients.*

KEYWORD *: intracerebral haemorrhage, stroke, adaptation response, adaptation outcome*

1. Introduction

Intracerebral haemorrhage (ICH), defined as the bleeding into the parenchyma of the brain that may be extend into the ventricles and, in rare cases, the subarachnoid space (Qureshi et al.2001). ICH classified as hemorrhagic stroke (Jauch & Kissela 2009) and accounts for 10 to 15 percent of all cases of stroke and is associated with the highest mortality rate, with only 38 percent of affected patients surviving the first year (Qureshi et al.2001). In Malaysia generally, the frequencies of hemorrhagic stroke about 17.2 percent (Ng, Goh, George et al. 1998).

Jauch and Kessela (2009), Indredravik, (2008), Dobkin, (2005), stated that the person with stroke may experience physical disability, cognitive deficits, speech problems, emotional difficulties, daily living problems, pain and post stroke complication . Results of studies stated that the intracerebral patients with problems related to stroke are at risk of medical complications during the rehabilitation stay and in community e.g. urinary tract infection, respiratory infection, limb pain, contractures and depression (Indredravik, 2008; Sackley et al. 2008; Longhorne et al. (2000). In relation to minimize stroke's impact and stroke complications, stroke patients and caregivers should have adequate stroke knowledge about risk factors, lifestyle management issues such as exercise, smoking, diet, weight, alcohol, stress management and regarding post stroke complication before discharge (Cross, 2008; Ostwald et al, 2008; O' Connell et al, 2003). Lack of information, leading to misconceptions, anxiety and fear, is believed to be a contributory factors to poor health status and emotional, both of which are common among stroke survivor and carer (Rodger et al, 2001).

Adaptation after experiencing stroke is perceived as a process of patients responding to the physiological, psychological, and social changes that occur with the onset of intracerebral bleeding and experience of living with a disability (Secrest & Zeller 2007). Adaptation outcome is the result of the process of individual's response to stroke related disability.
There are factors affecting adaptation of patients with stroke related change or disability due to intracerebral haemorrhage. The severity of stroke was strongly associated with a greater risk of most complications (Indredravik, 2008) and stroke patients who are more functionally dependent in self-care are likely to experience a greater number of complications than those who are less dependent (Indredravik, 2008; Sackley et al. 2008). The research findings suggest that the severity of cerebral dysfunction (Qureshi et al., 2001), high functional disability (Samsa & Matchar, 2004), low stroke knowledge among caregivers (Rodger et al, (2001) and presence of post-stroke complications (Longhorne et al. 2000) are critical factors in determining adaptation outcome after experienced living with change or disability.

A better understanding of the factors that affect stroke-related adaptation outcome is essential in planning specific stroke education and rehabilitation interventions. Thus, the hypotheses of this study were, the factors positively associated with adaptation were increased functional ability, no depression, no evidence of post stroke complication, high stroke knowledge. While the factors

negatively associated with low adaptation were alteration low neurological deficit, severity of illness, and presence of post stroke complications, depression and low stroke knowledge.

The aimed of this study was to determine stroke-related adaptation outcome in the rehabilitation phase and to determine factors affecting the adaptation outcome among ICH patients. The specific objective was to determine association between sociodemographic characteristics, clinical characteristics, acute complication, later complication, patient and caregiver stroke knowledge.

2. Methods

This was part of a prospective study conducted at Hospital Universiti Sains Malaysia (HUSM) and Hospital Sultanah Nur Zahirah (HSNZ) Terengganu, Malaysia during July 2009 September 2010. The study sample was patients admitted and diagnosed as having intracerebral haemorrhage during the study period. The inclusion criteria of the sample include (1) evidence of having intracerebral haemorrhage (ICH) on the initial CT scan, (2) Glasgow Coma Scale (GCS) 9 or more than 9 and in recovery stage. The patients who were eligible for the study were given verbal information regarding the study. The written consent to participate in this study was obtained from the patients who were conscious and for the patient with the problem of cognitive, the secondary consent was obtained from patients' family.

Adaptation outcome were assess using Functional Independence Measure (FIM) was a study outcome. The assessment was done in two different time, during acute phase after ICH (FIM 2 week) and second phase (FIM 3 month).

In phase one of data collection, other variables collected include patients' sociodemographic factors, clinical factors, neurological deficit (examined using National Institutes of Health Stroke Scale-NIHSS) and complication status (using Complication Inventory Checklist (CIC). In phase two, the patient was followed up at home in which the patients' FIM, complication status and patient and caregiver knowledge (using Caregivers' Stroke Knowledge Checklist) were assessed. The data was analyzed using Multiple linear regression.

3. Results

3.1 Sociodemographic characteristics

Table 1 showed that eighty subjects (49 males and 31 females) aged 32 to 79 participated in this study. Their mean (SD) age was 56 (11.5) years. About two third (77.6%) of the subjects were at level of low social economic status. More than half (56.3%) received education until primary school and or no schooling.

3.2 Clinical characteristics

Twenty five subjects (31.3%) of ICH patients are smokers. Majority of them had past health history of hypertension, 28.8 % are diabetes mellitus and 7.5 % having heart disease illness. The selected samples of this study are in category of mild level of altered consciousness (GCS 13-15) (77.5%) while 22.5 % in categorized of moderate level of altered consciousness (GCS 9-12). The result revealed that basal ganglia was the most common area (47.5 %) of bleeding intracerebral and followed by bleeding in lobar area (22.6%) and cerebellar (11.3%) in the brain. Seventy subject (87.6 %) were in categorized of moderate to severe neurological deficit (6-12 = 51-75 percentile) and ten subject (12.6 %) in categorized of mild to normal. The mean (SD) of patients' initial adaptation response (FIM) at 2 weeks after ICH was 48.6 (29.6), were categories in low adaptation and the mean (SD) of patients' adaptation outcome at 3 months was 91.9 (35.3)were categorized in moderate adaptation (Table 2). The result revealed that 68 % of stroke patients and families in categorized of low stroke knowledge and average stroke knowledge. Thirty one percent in categorized of moderately high to high knowledge related to stroke (Table 1). The frequency result of the individual item of stroke patient and caregiver knowledge related to stroke was display in Table 3.

3.3 Association between adaptation outcome [FIM 3 month] and initial adaptation [FIM acute], sociodemographic characteristics, clinical characteristics, acute complication, later complication, patient and caregiver stroke knowledge

The variables significantly associated with adaptation outcome [FIM 3 month] include Initial Adaptation (FIM 2 weeks) (β = .348 , $p < 0.05$), age (β = -.326, $p < 0.05$), total depression 3 month (β = -.327, $p < 0.05$), urinary Infection 3 month post stroke (β = -.265, $p < 0.05$), shoulder pain 3 month post stroke (β =.197, $p < 0.05$), Family caregiver (β = -.188), deep vein thrombosis 2 weeks stroke (-.147, $p < 0.05$). The seven predictor variables contributed significantly about 75.2 percent ($r = .867$) of variance change in adaptation outcome (FIM 3 month).

4. Discussion

Adaptation may be conceived as a process of responding to the functional, psychology, and social change that occur with the onset and experience of living with disability, chronic illnesses, or associated treatment, while adaptation outcome is long term response of patients' experience of living with disability, chronic illnesses, or associated treatment (Livneh 2001). There are factors contribute to affect improve or decline of adaptation outcome (FIM 3 month). The regression results indicate that factors significantly affect an adaptation outcome were Initial Adaptation (FIM 2 week), Age, Total depression 3 months, Urinary Infection 3 month post stroke, Shoulder pain 3 month post stroke, Family Caregiver, Deep vein trombosis 2 weeks post stroke.

Disability and dependence on other to function in motor and cognitive activities have been identified as factors that affect Adaptation Outcome. The regression result indicates that the score of Initial adaptation (FIM 2 week) was associated to increase score of adaptation outcome at 3 month. It proved that in the frequencies analysis, the result showed that mean (SD) of patients' initial adaptation response (FIM) at 2 weeks after ICH was 48.6 (29.6), were categories in low adaptation while the result showed their adaptation was improved at 3 month, (SD) was 91.85 (35.3) were categorized in moderate adaptation. The result indicate that ICH patients showed inability to do physical activities (self care activities of daily living, sphincter control, transfer and locomotion), communication, psychosocial activities and depend on family caregiver during acute phase. It similar to the previous finding stated that the stroke person may have physical disability and decline in functional activities (Dobkin, *2*005; Samsa et al. 2004; Brauer, Schmidt et al. 2001). However, their abilities increasing at 3 month post stroke. Hinkle, (2006) stated that functional ability at the time of admission is strongly linked to functional recovery in the inpatient stroke rehabilitation literature. For example, total FIM scores for 520 general stroke patients at admission were significantly correlated with total FIM scores at discharge (r = 0.80).

The second predictor that affect to the Adaptation Outcome (FIM 3 Month) was age. The result showed that the mean age in this study was 56 years. Result of study showed that age was significantly associated with adaptive outcome [FIM 3 month], indicating that younger age were factor influence adaptation outcome of ICH patients with disability. Previous review stated that age is commonly included in multivariate models for predicting mortality and outcome following stroke (Hinkle, 2006). Result of previous study stated that individuals who were less than 80 years of age had a higher incidence of survival following a stroke, in comparison to those over 80 years of age by (Dighe et al., 1997). Result of previous study showed that there are significant correlations between ages and coping among stroke patients, indicating lower coping was found in older patients (Darlington et al., 2007)

The change in physical and cognitive ability has potential to develop variety of post-stroke complications. Post stroke complications were one of the major factors that affect adaptation outcome. Previous result of studies that reported that the person with problems of stroke are at risk of medical complications during the rehabilitation stay and in community. The common post-stroke complication include neurological-recurrent stroke, chest infection, urinary infection, pressure sore, deep vein thrombosis and depression (Indredravik, 2008; Sackley et al. 2008; Longhorne et al. 2000).

The regression result of this study found that post stroke complications variables include depression at 3 months post stroke, urinary Infection 3 month post stroke, shoulder pain 3 month post stroke and deep vein thrombosis give a significant negative association with adaptation outcome. The result indicate that post stroke complication was a factors contribute to give a variance change in adaptation outcome, it means that increase score of post stroke complication contribute to decrease adaptation outcome and decrease score of post stroke complication, the adaptation outcome was

increase. The result of this study found that were similar with previous study stated that a negative correlation was found between Barthel Index score and the number of complications experienced (low scores on the Barthel Index correlate with a high number of complications (Sackley et al. 2008).

Regression analysis indicated that family caregivers of ICH patients were found contributed as factor that affect an adaptation outcome. The result indicates that family caregivers of ICH patients influence to improve or decline of adaptation outcome. In this study the frequency result showed that 66 percent of caregivers are ICH patient spouse and 28 percent are her/ his children. It indicate that ICH patient had family member to provide care, helping and support during rehabilitation phase. Previous review stated that 'the consequences of suffering a stroke are not isolated to the individual patient, and the family or loved ones are also caught up in circumstances that range from difficult to absolutely catastrophic (Mitchell, 2004).

However the regression result showed that stroke knowledge of patient & family caregivers did not have significant association with ICH patient adaptation outcome. The frequencies result of overall stroke knowledge of this study showed that ICH patients and caregivers had knowledge about stroke symptom such as motor function problem, language or speech problem, respiratory or urinary problem, however majority of them did not know that alteration of vision, sensory and cranial nerve function also can occur on stroke person. Majority of stroke patient and caregiver know that high blood pressure is one of the risk factor of stroke, however majority of them less aware that smoking, alcohol, diabetes and high level of cholesterol also stroke risk factors. Majority of stroke patient and caregiver know regarding the important of follow up after discharge however they did not have knowledge how to overcome the stress and depression problems if occur on stroke patient. Majority of them know that the stroke person should take medication prescribe by the physician and follow rehabilitation programme. The result of this study showed that majority of patient & family caregiver have less knowledge regarding post stroke complications and how to prevent post stroke complication and also they not aware regarding the important of follow up and assess to the medical facilities after discharge. It congruent with the previous result of study stated that 'lack of information, leading to misconceptions, anxiety and fear, is believed to be a contributory factors to poor health status and emotional, both of which are common among stroke survivor and caregivers' (Rodger et al, 2001).

5. Recommendation

Researcher highly recommended that nurses need to do risk assessments for stroke patients in the acute phase and in the longer term and also educating patients about risk of recurrent stroke and monitoring risk factors to help prevent another event. Professional health care providers are encouraged to develop specific ICH educational program to stroke survivors and their family caregivers. The content of stroke knowledge or information include information regarding stroke symptom, risk factor, management of depression, disease and symptom.

6. Conclusion

The preliminary result revealed that post ICH patients were categories in low adaptation response at early while moderate in adaptation outcome at three month. There are factors affecting adaptation of survivors with stroke related to intracerebral haemorrhage. The variables significantly associated with adaptation outcome were initial adaptation response, age of ICH patient, post stroke complications and family caregivers. The results and findings from this studies will contribute as evidence-base regarding factors that affect adaptation outcome of post intracerebral haemorrhage patients and the important of stroke education to stroke patients and family caregivers.

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Table 1: Sociodemographic and Clinical characteristics of ICH patients (n 80)

Variable	%
Age [mean]	56.1 (SD 11.4)
Education	
No history of schooling	16(20.0%)
Primary school	29(36.3%)
Secondary school	29(36.3%)
Tertiary level	6 (7.5%)
Social Economic Status	
High	8 (12.5%)
Moderately high	10(16.7%)
Middle	24(30.0%)
Moderately low	20(25.0%)
Very Low	11(36.7%)
Major Caregiver	
Spouse	53 (66.3%)
Children	22 (27.5%)
Parents/siblings	5 (6.3%)
Smoking Status	
Yes	25(31.3%)
No	55(68.8%)
Past Health History	
Hypertension	76(95.0%)
Hypercholesterolemia	2(2.5%)
Diabetes Mellitus	23(28.8%)
Heart Disease	6(7.5%)
Location of intracerebral haemorrhage	
Lobar	
Lobar (Rt)	9(11.3%)
Lobar (Lt)	9(11.3%)
Non Lobar	
Basal Ganglia (Rt)	20(25.0%)
Basal Ganglia (Lt)	18(22.5)
Thalamus (Rt)	6(7.5%)
Thalamus (Lt)	4(5.0%)
Putamen/Caudate	5(6.3%)
Cerebellum	9(11.3%)
Initial Neurological status [NIHSS]	
Normal to Mild (0-3 = <25 percentile)	3(3.8%)
Moderate (4-5 = 26 to 50 percentile)	7(8.8%)
Moderately Severe (6-12 = 51-75 percentile)	24(30.0%)
Severe (6-12 = 51-75 percentile)	46(57.5%)
Patients and caregivers' stroke knowledge	
Low stroke knowledge(1-10)	13(16.3%)
Average stroke knowledge(11-20)	42(52.5%)
Moderately high knowledge(16-23)	18(22.5%)
High knowledge(24-30)	7(8.8%

Table 2: Minimal scores, maximal scores, mean, standard deviation, and total FIM's score acute and 3 month post ICH n=80.

Variable	Min. Score	Max. Score	Mean(SD) Acute	Mean(SD) 3 month
Self-Care				
A. Eating	1	7	2.50 (1.83)	4.95(2.19)
B. Grooming	1	7	2.43(1.78)	4.94(2.19)
C. Bathing	1	7	2.38(1.72)	4.94(2.19)
D. Dressing Upper Body	1	7	2.36(1.72)	4.94(2.19)
E. Dressing Lower Body	1	7	2.36(1.72)	4.94(2.19)
F. Toileting	1	7	2.35(1.73)	4.94(2.19)
G. Sphincter Control (Bladder)	1	7	2.39(1.73)	5.05(2.21)
H. Sphincter Control (Bowel)	1	7	2.39(1.73)	5.05(2.21)
I. Transfer (Chair,Wheelchair)	1	7	2.24(1.66)	4.89(2.28)
J. Transfer (Tub, Shower)	1	7	2.24(1.66)	4.89(2.28)
K. Transfer (Tub, Shower)	1	7	2.24(1.66)	4.89(2.28)
L. Locomotion (Walk/Wheelchair)	1	7	2.25(1.67)	4.86(2.27)
M. Locomotion (Stair)	1	7	2.24(1.66)	4.85(2.26)
Communication				
N. Comprehension	1	7	3.81(1.66)	5.76(2.26)
O. Expression	1	7	3.73(2.27)	5.65(1.84)
Social Cognition				
P. Interaction	1	7	3.55(2.27)	5.49(1.99)
Q. Problem Solving	1	7	3.44(2.12)	5.34(1.96)
R. Memory	1	7	3.70(2.36)	5.50(2.04
Total mean	**18**	**126**	**48.6(29.6)**	**91.9(35.4)**

Table 3: Frequency and percentage of Patient and caregivers' Stroke Knowledge

No	Variable	Yes (%)	No (%)
1.	Patient & family caregiver knowledge of stroke symptoms		
	a) Motor function problem	77 (96.3%)	3 (3.8 %)
	b) Language or speech problem	68 (85.0%)	12 (15.0%)
	c) General symptoms	54 (67.5%)	26 (32.5%)
	d) Vision problem	17 (21.3%)	63 (78.8%)
	e) Sensory problems	19 (23.8%)	61 (76.3%)
	f) Cranial Nerve Problems	10 (12.5%)	70 (87.5%)
2.	Patient & family caregiver knowledge of Stroke risk factors		
	a) Hypertension	73 (91.3 %)	7 (8.8 %)
	b) Smoking	26 (32.5%)	54 (67.5%)
	c) Hypercholesterolemia	22 (27.5%)	58 (72.5%)
	d) Diabetes mellitus	28 (35.0%)	52 (65.0%)
	e) Alcohol	8 (10 %)	72 (90.0 %)
	f) Heart disease	14 (17.5%)	66 (82.5)
	g) Stress	20 (17.5%)	66 (82.2%)
3.	Patient & family caregiver knowledge of who would you contact case of stroke		
	a) Emergency medical system	20(25%)	60 (75%)
	b) Family physician	27(33.8%)	53 (66.7%)
	c) Relative/neighbors	76 (95%)	4 (5.0%)
4.	Patient & family caregiver knowledge of the important of follow up after discharge	75(93.8%)	5 (6.3)
5.	Patient & family caregiver knowledge regarding how to prevent and control depression		
	a) Refer to physician if patient feels or show behavior like sadness, anxiety & depress	24(30 %)	56(70.0%)
	b) Refer to physician if patient isolate herself/himself	20(25.0%)	60(75.0%)
	c) Take medicine prescribed by physician if feeling emotional	26 (32.5%)	54 (67.5%)
6..	Knowledge to manage the stroke problem		
	a) Take medicine prescribed by physician	75(93.5)	5(6.3%)
	b) Follow rehabilitation program as suggested	58(72.5%)	22(27.5%)
7.	Patient & family caregiver knowledge of Level of knowledge about complication due to stroke		
	a) Lung infection	24(30.0 %)	56 (70.0%)
	b) Mobility problems	49 (61.3 5)	31 (38.8%)
	c) Deep vein thrombosis	8 (10.0%)	72(90.0%)
	d) Shoulder pain	36(45.0%)	44 (55.0%)
	e) Bed sore	22 (27.5%)	58 (72.5%)
	f) Urinary infection	15(18.8%)	65(81.3%)
	g) Stress	16(20.0%)	64(80.0%)

Corresponding Author: Sabarisah Hashim
Telephone numbers: 6012-9833297/ 609 7677551
Email address: risha@kck.usm.my
Postal address: PT 1924, Jalan Sri Iman 9/45, Taman Sri Iman, Mukim Telok, 16100, Kota Bharu Kelantan, Malaysia

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