Effect of Nursing Intervention Protocol on the Severity of Dysphagia among Recently Stroke Patients

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Abstract

Aim: This study aimed to assess the effect of nursing intervention protocol on the severity of dysphagia among recently stroke patients.

Study Design: A Quasi experimental design.

Setting: The study was conducted at the neuro-critical care units at said jalal hospital.

Study subjects: 60 patients complain of stroke within the first month was included in the study and divided randomly into two equal groups 30 patients for each one for application of the intervention (study group) and other receiving the routine hospital care (control group).

Data collection tools: interview questionnaire sheet including demographic characteristics and assessment of the patients history and Gugging swallowing screen.

Result: Highly statistically significant difference in the severity of dysphagia between study and control group patients.

Conclusion: the implementation of nursing intervention protocol was effective in improving the severity of dysphagia. It is recommended to generalize intervention protocol in the routine hospital care.

Keywords: Stroke; Dysphagia; Nursing intervention protocol

Introduction

Swallowing, as the first phase of digestion, is one of the most complicated neuromuscular processes of the central nervous system, it involves multiple areas of the brain and a series of voluntary and involuntary Muscular contractions, oro pharyngeal dysphagia is a highly prevalent clinical condition among stroke patients [1].

Dysphagia is a commonly documented morbidity after stroke, but its reported frequencies are widely discrepant, ranging between 19% and 81%. The presence of dysphagia has been associated with an increased risk for pulmonary complications and even mortality. There is emerging evidence that early detection of dysphagia in patients with acute stroke reduces not only these complications but also reduces length of hospital stay and overall health care expenditures [2].

All staff working with stroke patients should have the knowledge and skills appropriate to their role in the pathway, including those for the detection and management of dysphagia and its complications, inter professional competences have been developed to inform the training and organization of teams in all aspects of dysphagia [3].

Strategies to improve dysphagia are aimed at decreasing its complications through changing patient's posture, feeding in upright position, turning the head to paretic side, diet modifications and oral motor exercise. In many hospitals, dysphagia screening is performed by speech-language therapists who are often not available on weekends/holidays, which results in delayed dysphagia assessment [4].

The presence of formal guidelines for the identification and management of dysphagia may have a significant effect on serious adverse outcomes such as chest infections and death. Training nurses to conduct dysphagia screening and management protocol will improve patient outcomes. If nurses screen patients with an acute neurological impairment within 24 h of admission, it may reduce the time that patients spend without appropriate methods of nutrition and hydration and improve clinical outcomes [5].

Aim of the study

This study aimed to assess the effect of nursing intervention protocol on the severity of dysphagia among recently stroke patients.

The aim was achieved through the following:

- Assess the severity of dysphagia among stroke patients.

- Develop nursing intervention protocol according to the basic assessment for stroke patients.
- Implement the nursing intervention protocol for stroke patients.
- Evaluate the effect of nursing intervention on the severity of dysphagia among stroke patients.

Research questions

What is the effect of nursing protocol on the severity of dysphagia among recently stroke patients?

Subjects and Methods

Research design

A Quasi experimental design was conducted in this study.

Setting

This study was conducted at neuro- critical care units (neuro critical 1, new intensive care unit and stroke unit) at Bab Elsheria hospital (Sayed galal).

Sample and subjects

A convenient sample of 60 patients complain of stroke was included in this study and divided randomly & alternatively into two equal groups 30 patients for each:- one for application of the intervention (Study group) and the other receiving the routine hospital care (control group)with the following inclusive criteria: Adult (age 18-60 years), conscious, who suffered from a recent (within the first month) stroke.

Exclusion criteria

Patients with severe malnutrition, patients have aspiration pneumonia, patients have aphagia, patients have esophageal cancer and jaw fractures.

Tools of data collection

Tool I: Interview questionnaire: The investigator was designed two types of tools for patients after reviewing the current related literature. It was divided into two parts:

Part I demographic data: It aimed to assess age, sex, occupation, marital status, smoking and recurrence stroke.

Part II: It aimed to assess past medical, surgical and allergy history.

Tool II: The Gugging swallowing screen was developed by Trapl et al. [6]. The GUSS consists of 4 subtests and is divided into 2 parts: the preliminary assessment or indirect swallowing test (Subtest 1) and the direct swallowing test, which consists of 3 subtests. These 4 subtests must be performed sequentially.

In the indirect swallowing test:

- Vigilance,
- Voluntary cough and/or throat clearing;
- Saliva swallowing (swallowing, drooling, voice change) are assessed.

The direct swallowing test assesses the deglutition, involuntary cough, drooling and voice change within the semi-solid swallowing, liquid swallowing and solid swallowing trial. The Evaluation is based on a point system, for each subtest a maximum of 5 points can be reached. Thus twenty points are the highest score that a patient can attain, and it denotes normal swallowing ability without aspiration risk. In total 4 levels of severity can be determined:

- Severe dysphagia and high aspiration risk.
- Moderate dysphagia and moderate risk of aspiration.
- Mild dysphagia with mild aspiration.
- Normal swallowing ability. For each level of severity different diet recommendations are given.

Content validity and reliability: Validity of the designed structured interviewing questionnaire was evaluated by Markidan et al. [7] expertises in the medical surgical nursing in Faculty of Nursing Ain shams University, for content clarity and objectivity. The reliability coefficient for the study tool was calculated using the correlation coefficient Cronbach's alpha test (0.844 and 0.846) that is statistically accepted as a good coefficient.

Pilot study: A pilot study was carried out on 6 patients (10% of total sample) to test the clarity, applicability, feasibility and relevance of the tools used and to determine the needed time for the application of the study tools. The patients who were included in the pilot study were included to the sample because no modification was done after conducting pilot study.

Field of work: The data collection process started on the beginning of June (2018) till the end of June (2019). This was conducted within 4 days weekly (Tuesday, Wednesday, Thursday and Friday) from 8 am to 8 pm.

The field work was done through assessment, planning, implementation and evaluation phases.

Assessment phase: the aim of this phase was to assess swallowing deficits within the first 24 hours of patient admission to a stroke unit used a valid screening tool (GUSS) by the investigator and time was taken 30-45minutes.

Planning phase: plan of care was developed for each patient based on the findings of the assessment and nursing intervention protocol was formulated.

Implementation phase: patients of the study group received the nursing intervention protocol according to the severity of dysphagia; intervention was carried out by the investigator for each patient.

Evaluation phase: Each patient in the study group was evaluated two times during the study period by using tool II. The first was within the first 24 hours of patient admission to a stroke unit. Then for evaluation of the effectiveness of the intervention protocol after one week by the same tool.

Each patient in the control group was evaluated once one week from received routine hospital care by using the same tool.

Ethical considerations: Official approval was obtained from Research Ethics Committee in Faculty of Nursing; Helwan University to conduct the current study. The investigator clarified the objective and aim of the study to the sample included. The investigator assured maintaining anonymity and confidentiality of the subject data.

Statistical design: The collected data were organized, categorized, tabulated and statistically analyzed using the statistical package for social science (SPSS) version. Data were presented in tables and graphs. The statistical analysis included; percentage (%), the arithmetic mean (), standard deviation (SD), T-test (T), Pearson correlation (R), F-test and chi-square (X_2).

The observed differences and associations were considered as follows:

- P>0.05 Non- significance (No difference).
- P ≤ 0.05 Significance difference.
- P ≤ 0.001 Highlysignificance difference.

Results

Regarding the demographic characteristics of the studied patients (Table 1), 76.7% of the studied patients less than or equal 40 years, 60% of the studied patients were male, 48.3% were working, 80% were married, 50% smoking and 65% of the studied patients had no recurrent stroke.

%	No	Items
Age		
76.70%	46	≤40 years
23.30%	14	>40 years
Gender		
60.00%	36	Male
40.00%	24	Female
Occupation		
25.00%	15	House wife
26.70%	16	Retired
48.30%	29	Working
Marital status		
0.00%	0	Single
80.00%	48	Married
18.30%	11	Widow
1.70%	1	Divorced
Smoking		
50.00%	30	No
50.00%	30	Yes
Recurrent stroke		
65.00%	39	No
35.00%	21	yes

Table 1: Frequency of the study patients according to demographic characteristics (N=60).

Regarding Frequency of the patients according to past medical, surgical and allergic history (Table 2), it was found that,(91.7%) of the studied patients had medical history, (45%) of patients had hypertension disease, While (51.7%) of the studied patients had surgical history.

(20.0%) of the studied patients had cesarean section delivery. Furthermore (11.7%) of them had allergy from penicillin.

Items	%	No
Medical history		
Yes	91.70%	55
Surgical history		
Yes	51.70%	31
Type of disease		
Ischemic heart disease	5.00%	3
Diabetes Mellitus	28.30%	17
Hypertension	45.00%	27
Hemorrhagic stroke	10.00%	6
Ischemic Stroke	25.00%	15
Type of Surgery		
Cesarean section	20.00%	12
Total hip replacement	10.00%	6
Medication allergy		
Penicillin	11.70%	7
Food allergy		
Strawberry	20.00%	12

Table 2: Frequency of the patients according to past medical, surgical and allergic history (N=60).

Regarding Application of indirect swallowing test among patients of the study group throughout pre and post intervention protocol (Table 3).

Preliminary investigation /indirect swallowing test	Pre				Post			
	Yes		No		Yes		No	
	No	%	No	%	No	%	No	%
Vigilance								
(the patient must be alert for 15 minutes)	30	100	0	0	30	100	0	0
Cough and /or Throat clearing								
(Voluntary cough)	29	96.7	1	3.3	30	100	0	0
Saliva swallow								
• Swallowing successful	29	96.7	1	3.3	30	100	0	0
• Drooling	5	16.7	25	83.3	0	0	30	100
• Voice change	2	6.6	28	93.3	0	0	30	100

Table 3: Application of indirect swallowing test among patients of the study group throughout pre and post intervention protocol (N=30).

It was found that,(96.7%) of patients' pre intervention had swallowing successful and voluntary cough while (100.0%) of them

post intervention had swallowing successful and voluntary cough. Furthermore (16.7%), (6.6%) of patients pre had drooling and voice change. while (100.0%) of them hadn't drooling and voice change post intervention. Regarding Application of direct swallowing test among patients of the study group throughout pre and post intervention protocol (Table 4), it was found that, (36.6%) of the study patient's had semisolid swallowing successful pre intervention and (80.0%) of them post intervention. While (20.0%) of study patients had liquid swallowing successful pre intervention and (33.3%) post intervention.

Furthermore (6.6%) of them had solid swallowing successful pre intervention and (13.3%) post intervention. Regarding Application of indirect swallowing test among patients of the control group (Table 5). It was found that (100.0%), (90.0%) of control patients had alert and saliva swallowing successful. While (93.3%) of them hadn't voice change. Regarding Application of indirect swallowing test among patients of the control group (Table 6), it was found that (26.7%), (13.3%), (6.7%) of patients had semisolid, liquid and solid swallowing successful.

Direct swallowing test	Semisolid				Liquid				Solid			
	Pre		Post		Pre		Post		Pre		Post	
	No	%	No	%	No	%	No	%	No	%	No	%
Deglutition Swallowing not possible	4	13.3	0	0	0	0	1	3.3	0	0	0	0
Swallowing delayed	8	26.6	6	20	6	20	12	40	2	6.6	4	13.3
Swallowing successful	11	36.6	24	80	6	20	10	33.3	2	6.6	4	13.3
Cough (involuntary): (before, during, after- until 3minutes later)	10	33.3	3	10	8	26.6	10	33.3	3	10	3	10
Drooling	3	10	1	3.3	6	20	7	23.3	2	6.6	3	10
Voice change (listen to the voice before and after swallowing)	5	16.6	0	0	1	3.3	5	16.6	2	6.6	1	3.3

Table 4: Application of direct swallowing test among patients of the study group throughout pre and post intervention protocol (N=30).

Preliminary investigation / indirect swallowing test	Yes		No	
	No	%	No	%
Vigilance (the patient must be alert for 15 minutes)	30	100	0	0
Cough and /or Throat clearing (Voluntary cough)	28	93.3	2	6.7
Saliva swallow Swallowing successful	27	90	3	10
Drooling	7	23.3	23	76.7
Voice change	2	6.7	28	93.3

Table 5: Application of indirect swallowing test among patients of the control group (N=30).

Regarding comparison according to the severity of dysphagia among patients in the study group throughout pre and post intervention (Figure 1). It was found that there is a statistically significant difference in the severity of dysphagia in the study group patient throughout pre and post intervention.

Regarding comparison according to the severity of dysphagia among study and control group patients (Figure 2), it was found that there is a highly statistically significant difference in the severity of dysphagia between study and control group patients.

Direct swallowing test	Semisolid				Liquid				Solid			
	Yes		No		Yes		No		Yes		No	
	No	%	No	%	No	%	No	%	No	%	No	%
Deglutition:												
Swallowing not possible	4	13.3	0	0	0	0	0	0	0	0	0	0
Swallowing delayed	8	26.7	0	0	5	16.7	0	0	1	3.3	0	0
Swallowing successful	8	26.7	22	73.3	4	13.3	26	86.7	2	6.7	28	93.3
Cough (involuntary): (before, during, after- until 3minutes later)	11	36.7	9	30	6	20	3	10	3	10	0	0
Drooling	4	13.3	15	50	3	10	6	20	3	10	0	0

Citation: Elabdeny ZA, Ali ZH, Shehata MH, Abd-Elgabar MA (2020) Effect of Nursing Intervention Protocol on the Severity of Dysphagia among Recently Stroke Patients. J Health Edu Res Dev 8: 310.

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Voice change (listen to the voice before and after swallowing)	5	16.7	15	50..0	1	3.3	8	26.7	2	6.7	1	3.3

Table 6: Application of direct swallowing test among control group patients (N=30).
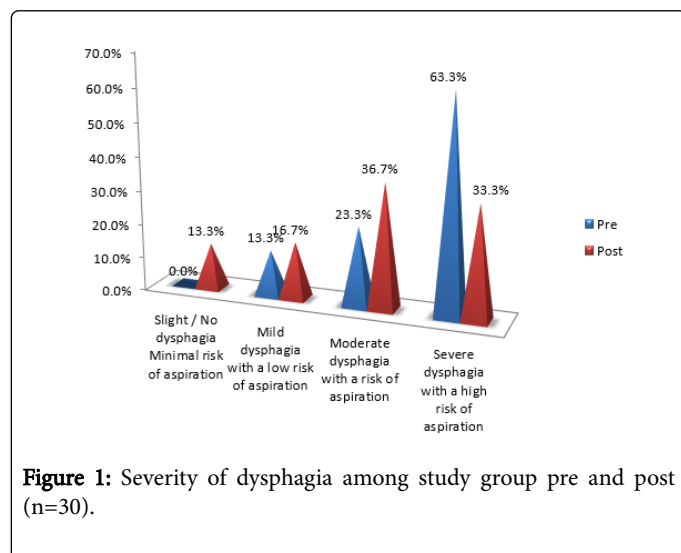
Figure 1: Severity of dysphagia among study group pre and post (n=30).
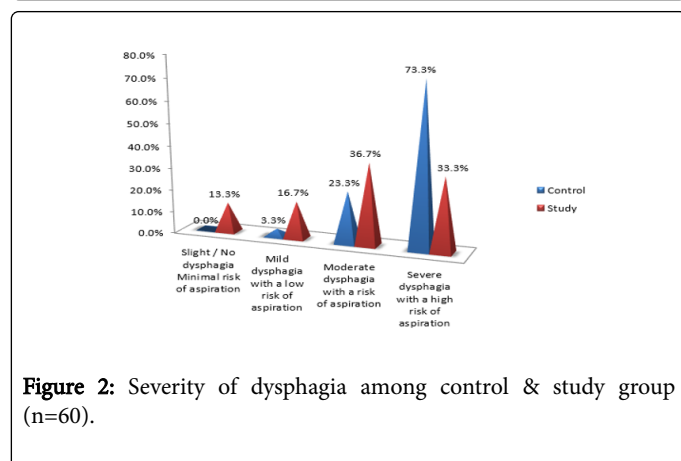

Figure 2: Severity of dysphagia among control & study group (n=60).

Discussion

Regarding the characteristics of the studied patients, the study revealed that the majority of the studied patients were male. This may be due to smoking, which damages blood vessels; Men are more likely to be smokers than women. These findings were in accordance with [7], entitle for smoking and risk of ischemic stroke in young men and reported that strong relation between the numbers of cigarettes smoked daily and ischemic stroke among young men.

Regarding the studied patients age, the present study illustrated that the majority of the studied patients less than or equal 40 years. These finding on the same line with Kissala and Khoury [8] who studied age at stroke and reported that Stroke incidence rates in those 20-54 years of age were significantly increased in both black and white patients.

Also these findings were inconsistent with Smajlovic [9], entitle for strokes in young adults and reported that strokes in young adults are reported as being uncommon, comprising 10% to 15% of all stroke patients.

As regard their occupation, the result of the present study revealed that the majority of the studied patients were working; this may be due to their young age. These findings were inconsistent with Eshak [10], entitle for changes in the employment status and risk of stroke and stroke types and reported that Job lost men and women had increased risks for both hemorrhagic and ischemic stroke incidence and mortality.

Regarding the studied patients marital status, the study revealed that the majority of the studied sample was married. This finding was supported by Ali [11], entitle for Effect of Nursing Care Strategy on the Functional and Physical Abilities of Patients Following Stroke who stated that (96.7%) of the sample was married.

Concerning smoking, of the present study illustrated that half of the studied patients were smoker. This may be due to more than half of the studied patients were male. This finding was supported by Shah and Cole [12], who studied the more you smoke the more you stroke who mentioned that smoking is a risk factor for stroke.

Regarding recurrent stroke, the present study illustrated that more than a half had no recurrent stroke. This finding was disagree with Fu et al. [13], entitle of risk factors associated with recurrent strokes in young and elderly Patients: A Hospital-based Study and found that previous history of ischemic stroke or transient ischemic attack were independent risk factors of recurrent strokes.

Regarding medical history, the present study revealed that more than one third of the studied patients had hypertension. These findings were supported by Boehme et al. [14], who studied stroke risk factors, genetics and prevention and found that the higher the blood pressure, the higher the risk of stroke.

Concerning surgical history, the study revealed that less than one quarter of the studied patients had cesarean section delivery; these findings may be due to venous thrombo embolism this result was agree with Lin et al. [15], who studied increased risk of stroke in patients undergo cesarean section delivery and reported that increase the risk of postpartum stroke during the 3-, 6-, or 12-month period after delivery.

Concerning allergy history (11.7%) of the studied patients had a medication allergy from penicillin, (20%) of the studied patients had food allergy from strawberry; these findings may be due to Anaphylaxis is a serious allergic reaction that may have different manifestations including hypotension. It is reported that vertebral artery hypoplasia (VAH) may bepresent in up to 20% of the general population.

Previous studies have demonstrated that patients with VAH have a higher risk of developing an ischemic stroke in the area supplied by this hypo plastic artery. This result was agreed with Robles and Matilla [16], who studied brain Stem Ischemic Stroke Associated with Anaphylaxis and reported that patients with hypotension secondary to anaphylaxis may have a higher risk of stroke.

Regarding comparison according to the severity of dysphagia among patients in the study group throughout pre and post intervention, the study illustrated that there was a statistically significant difference in the severity of dysphagia in the study group patient throughout pre and post intervention.

The finding was in agreement with El-Tamawy et al. [17], who studied that the influence of physical therapy on oro- pharyngeal dysphagia in acute stroke patients and reported that after intervention there was significant improvement in all variables in the study group.

Also these finding was disagree with Lopes et al. [18], who studiedimpact of the systematic use of the gugging swallowing screen in patients with acute ischemic stroke and stated that systematic administration of GUSS in a population of patients with acute ischemic stroke did not reduce the occurrence of stroke associated pneumonia, mortality and three-month functional dependence when compared with the systematic administration of the 10 ml waterswallowing test.

Regarding comparison according to the severity of dysphagia among study and control group patients, the current study showed that there was statistically highly significant difference in the severity of dysphagia between study and control group patients. The findings were consistent with Carnaby et al. [19] and found that their intervention for dysphagia within the first week after stroke improved swallowing function.

Conclusion and Recommendations

On the light of the findings of the present study, it was concluded that the implementation of nursing intervention protocol within first 24hours of patient admission to neuro-critical units is successful in improving the severity of dysphagia over one week after stroke. More-over showed that significant difference in total knowledge and total performance of nurses regarding caring of patients with dysphagia after recently stroke throughout pre and immediately after implementation of nursing intervention protocol.

The protocol was applied in a governmental hospital with limited human resources and facilities, and it succeeded, therefore the nursing intervention protocol can be applicable in a variety of hospital types.

The present study suggests the following recommendations:

It is recommended to generalize such intervention protocol in the routine hospital care provided to stroke patients.

- Develop continuing in-service training programs for nurses who work in the neurological units about the assessment of dysphagic patients, the compensatory postures and oral motor exercises to be carried out with dysphagic patients.
- Establish a multi disciplinary team for dysphagia management including a nurse, speech- language pathologist, dietician, and a neurologist.

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