SHORT COMMUNICATION

Post-stroke swallowing and communication complications: prevalence and association with comorbid conditions and risk factors

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Abstract

A cross sectional study utilising convenience sampling was conducted to determine the co-morbidities and risk factors in post stroke patients with swallowing and communication complications. The study recruited 150 diagnosed cases of stroke with no gender and age limitation from Combined Military Hospital, Fatima Memorial Hospital, and Mayo Hospital, Lahore, from January to June 2015. Glasgow coma scale, Modified Massey Bedside Swallow Screener, informal clinical assessment by SLP, and medical history sheet were employed for data collection, while the data was analysed using SPSS -23. Results revealed 103 (68.7%) patients with swallowing and 99 (66%) with communication difficulties. Swallowing issues revealed significant association with age (p=.016); history of stroke (p=.017), smoking (p=.004), alcohol intake (p=.035), diabetes mellitus (p=.003), and GCS (p=.009). Communication difficulties had significant association with hypertension (p=.029), GCS (p=.000). Hence, stroke related dysphagia is associated with diabetes mellitus; level of consciousness, previous history of stroke, smoking, alcohol abuse, and age, while communication issues are associated with hypertension and level of consciousness.

Keywords: Comorbidity, Deglutition disorders, Risk factors, Speech, Stroke.

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Introduction

Stroke is the disruption of blood flow to parts of brain resulting in brain cell death because of lack of oxygen and nutrients[1] and is classified as Ischaemic and haemorrhagic. Eighty percent of strokes are ischaemic.[2] A number of risk factors are incriminated with modifiable ones including hypertension (HTN), smoking, alcohol, drugs, lack of activity, hyperlipidaemia, diet, diabetes mellitus (DM), and atrial fibrillation, and non-modifiable being age, gender, ethnicity, transient ischaemic attacks (TIA), and genetics.[1] The prevalence of stroke increases with age and is more frequent in younger women and older men.[1] Stroke may be accompanied with swallowing and communication disorders with communicational disorders having a high prevalence of 30-60%,[2] including dysarthria (28%) or dysarthria (24%) cum aphasia (12%).[3]. Similarly, a high prevalence of dysphagia, i.e. 50%, has been reported with stroke[4] and an even higher prevalence of 53% in a local study[5]. This area requires research since stroke-related communication difficulties, especially aphasia, seriously affect the patients' quality of life.[6]

Stroke is a major cause of death with 5.5 million deaths per year and affects 13.7 million every year. Though prevalence of the disease decreased by 42% from 1990 to 2016 in countries with high income, it doubled in low and middle income nations in the same period.[1] A local study revealed a prevalence of 1.2% in a relatively younger sample of people with a mean age 43.39± 0.85 years.[7] When compared to the existing world literature on stroke prevalence, it was estimated that the prevalence was the highest in Pakistan.[1]

A local study revealed high prevalence of stroke from Pakistan with 393 cases having Ischaemic type of stroke, 126 with intracerebral and 50 with subarachnoid bleeding with lacunar stroke being the most common, indicating stroke as a common medical entity.[7] Local studies reveal a higher prevalence of risk factors and comorbidities including DM, HTN with males being more affected.[7] India has a higher prevalence in urban areas, especially metropolitans, with DM and HTN having higher rates of cardiovascular morbidity.[8]

Keeping in view the high prevalence of stroke,[1] diabetes and HTN[7] and lack of local literature, the current study was conducted with the objective to determine the co-morbidities and risk factors in patients who had swallowing and communication problems associated with stroke. This study will help clinicians to better manage post-stroke dysphagia and help health

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authorities plan better preventive strategies.

Patients and Methods

This cross sectional survey with convenience sampling recruited 150 diagnosed cases of stroke from Fatima Memorial, Mayo, and Combined Military Hospitals, Lahore, from January 1, 2015 to June 31, 2015.

Inclusion criteria was patients admitted with stroke with no age and gender limitations, while exclusion criteria was cases with progressive neurological diseases, endotracheal intubation or tracheostomy, on mechanical ventilation.

Sample was calculated considering the mean prevalence of disease of 10%,[7] DEFF = 1, with confidence level of 95% and 5% absolute precision. Ethical approval was obtained vide registration number Appl. RCRS/RRC/13/0004. Glasgow Coma Scale (GCS) to assess alertness level, Massey Bedside swallow screener (MBSS) to assess swallowing ability at day seven, informal clinical assessment of communicational ability by speech language pathologist and medical history sheet including patient's biodata, history of risk factors, comorbid conditions and diagnosis were utilised for data collection. The judgment of ability to swallow was considered unsafe on observation of involuntarily coughing, choking during swallowing or immediately within the first two minutes, lack of laryngeal elevation, dribbling, or change of voice. Following successful swallow, they were tested with 60ml plain water. Difficulty or a failure was concluded as a failed swallow test, i.e. dysphagia.

With analysis using SPSS-19, Pearson's correlation was utilised and $p<0.05$ was considered significant.

Results

The current study sample with mean age of 62.89±8.9 years comprised mostly males, i.e. 100 (66.7%), and majority, i.e. 103 (68.7%), had swallowing problems. As evident from Table 1, the only variable group which revealed significant association included among demographic characteristics was age which revealed a significant negative correlation with swallowing symptoms (r = -.197, p=.016), while in the history, stroke (r=.194*, p=.017) and smoking (r=.236**, p=.004) revealed a significant positive, and alcohol intake (r = -.172*, p=.035) a significant negative correlation with swallowing problems. As regards comorbidities, HTN revealed a significant negative correlation with communicational issues (r= -.178*, p=.029) and diabetes mellitus had a significant positive correlation with swallowing symptoms (r=.239**, p=.003). GCS score category revealed significant negative correlation with communication (p=-.305**, p=.000) and swallowing issues (r=-.214**, p=.009). The post stroke communication and swallowing complications revealed significant positive correlation with each other (r=.374**, p=.000), while all other variables did not reveal any significant association (Table 1).

Table: Descriptive Statistics: Variables versus Communication and Swallowing Problems. Cross Tabulation & Correlation (n=150).

Category	Variable	Group	n(%)	Communication Problem r, p-value	Swallowing Problem r, p-value
Demographic Characteristics	Age [Mean ±SD)		62.89 ±8.9	-.142, .084	-.197*, .016
	Gender	Female	50 (33.3)	-.156, .056	-.112, .173
		Male	100 (66.7)		
History	Neurologic Diseases	No	150 (100)	-	-
	Loss of consciousness	No	113 (75.3)	.05, .054	.053, .519
		Yes	37 (24.7)		
	Stroke	No	116 (77.3)	-.012, .887	.194*, .017
		Yes	34 (22.7)		
	Smoking	No	46 (30.7)	.066, .42	.236**, .004
		Yes	104 (69.3)		
	Drug Abuse	No	143 (95.3)	.063, .446	.081, .323
		Yes	7 (4.7)		
	Alcohol Intake	No	148 (98.7)	-.088, .287	-.172*, .035
		Yes	2 (1.3)		
Comorbidities	Hypertension	No	37 (24.7	-.178*, .029	.047, .569
		Yes	113 (75.3)		
	Diabetes	No	103 (68.7)	.042, .607	.239**, .003
		Yes	47 (31.3)		
	Cardio-vascular disease	No	105 (70)	-.011, .898	.129, .117
		Yes	45 (30)		
Stroke	Type	Haemorrhagic	52 (34.7)	.113, .169	.082, .32
		Ischemic	98 (65.3)		
	GCS	Mild	99 (66)	-.305**, .000	-.214**, .009
		Moderate	51 (34)		
Post-stroke Problems	Communication	No	51 (34)	1	.375**, .000
		Yes	99 (66)		
	Swallowing	No	47 (31.3)	.374**, .000	1
		Yes	103 (68.7)		

Discussion

The current study revealed that majority, i.e. 68.7% cases had swallowing and 66% had communication issues. Similarly, literature reveals that stroke related dysphagia has significant association with communication disorders in 73% of dysphagia cases with aphasia or dysarthria or apraxia of speech and only 26% with dysphagia alone.[9]

The current study's issues significantly correlated with history of previous stroke with no significant correlation

with communication problem. However, the swallowing difficulty and communicational problems did not correlate with history of unconsciousness.

In the current study, history of stroke revealed significant positive correlation with dysphagia, and no significant association with communicational problems. In contrast, Gorden C. et al reported that there was no significant association of dysphagia with previous CVA.[10]

In the current study, though no significant association of age was noted with communication issues, age revealed a significant negative correlation with swallowing problems. While Gorden C. et al reported that dysphagia was significantly more common between the age of 44 to 85 years,[10] Peña-Chávez R. et al reported that dysphagia following stroke is significantly associated with higher age with 80% observed in the 60-89 years' age group.[9]

In compliance with literature,[9] in the present study, no significant correlation of communication and swallowing symptoms was noted related to gender. In contrast, Jones C. A. et al in a review noted that male gender and older age predict dysphagia following stroke.[11]

In the current study, no significant correlation was noted with the type of stroke; however, GCS score revealed significant correlation with communication and swallowing problems. A study by Jones C. A. et al noted that higher GCS and haemorrhagic stroke compared to ischaemic stroke was a predicting factor for stroke.[11] Literature reveals that stroke cases suffered an average of 2.38 (±0.85) (range 0 to 6) comorbidities, commonest being HTN (86%), cardiovascular issues (64.6%), and diabetes mellitus (DM) (38.5%).[12] In the current study, among post-stroke cases presence of HTN had a significant correlation with communicational issues and DM revealed significant relationship with swallowing symptoms. Gorden C. et al reported no significant association of swallowing with HTN and DM in cases with stroke.[10] In contrast Peña-Chávez R. et al also reported that dysphagia is significantly associated with HTN in stroke patients.[9]

In the current study post-stroke communication and swallowing difficulties revealed significant positive correlation with each other. Similarly, Jones C. A. et al in a review noted that communication problems as presence of dysarthria, dysphonia, and cognitive impairment predicted dysphagia due to stroke.[11]

Hence, for best outcome of those who survive stroke, screening for communication and swallowing impairment is critical.[2]

Conclusion

Stroke-related dysphagia is associated with diabetes mellitus; GCS level; previous history of stroke, smoking, alcohol abuse, and age of the patient. While stroke-related communication issues are associated with hypertension and GCS level.

Limitations: The study was limited to one city of the province, hence results cannot be generalised.

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