

## Deglutition Disorders during Stroke: Clinical, Paraclinical and Prognostic Aspects in the Neurology Department of Conakry University Hospital

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Received: 21 Jul 2023; Accepted: 28 Aug 2023; Published: 02 Sep 2023

**Citation:** Camara M, Dore M, Toure ML, et al. Deglutition Disorders during Stroke: Clinical, Paraclinical and Prognostic Aspects in the Neurology Department of Conakry University Hospital. J Med - Clin Res & Rev. 2023; 7(9): 1-4.

### ABSTRACT

**Introduction:** Swallowing disorders are a significant factor in mortality and morbidity in patients with acute stroke. The aim of this study was to assess the incidence, clinical course and prognosis of swallowing disorders during stroke in the Neurology Department of Conakry University Hospital.

**Patients and Methods:** This was a prospective descriptive study lasting 6 months from 1<sup>er</sup> July to 31 December 2020. All patients hospitalised for stroke confirmed by brain imaging were included. All patients hospitalised for stroke with a swallowing disorder assessed by the Deppipo test were included.

**Results:** During our study period, 76 of 187 patients (40.6%) presented with swallowing disorders. Women predominated (71.1%). Coughing during swallowing was the main symptom observed in 69.7% of patients, followed by the absence of a nausea reflex in 52.6%. The mean NIHSS was  $13.5 \pm 3.4$ . A good outcome was observed in 48.6%, with 38.1% of patients developing inhalation pneumonitis. This was strongly associated with mortality ( $p < 0.001$ ). The mortality rate secondary to swallowing disorders was 28.90%.

**Conclusion:** Swallowing disorders during stroke are common and lead to complications and high mortality.

### Keywords

Swallowing disorders, Stroke, Inhalation pneumonitis, Mortality.

### Introduction

Swallowing disorders are a significant factor in mortality and morbidity in acute stroke patients [1].

The incidence of swallowing disorders in the acute phase of stroke varies from 25% to 81% depending on the study, and decreases to 11% to 50% in six-month survivors [2]. The clinical presentation is polymorphous, and several clinical screening tests are available, but few have been validated by studies. Videofluoroscopy remains the gold standard [3]. Treatment is ideally multidisciplinary, and no pharmacological treatment has proved effective. The use of electrostimulation to rehabilitate swallowing disorders is an

innovative and encouraging method [4-6].

In the first two weeks, around 50% of patients recover swallowing function spontaneously, and persistent swallowing problems are associated with longer hospital stays and increased mortality [7,8]. In Africa, the frequency of swallowing disorders is 26.9% in Congo Brazzaville [9] and 37.4% in Burkina Faso [10].

The aim of this study was to investigate the incidence, clinical and prognostic aspects of swallowing disorders during stroke.

### Materials and methods

This study was a prospective descriptive study conducted at the Neurology Department of the Ignace DEEN National Hospital and approved by the Guinean Society of Neurology.

The survey ran from 1<sup>st</sup> July to 31 December 2020 and covered all patients hospitalised for stroke. Patients with stroke and a swallowing disorder were included in this study. Swallowing disorders were diagnosed by questioning, physical examination and the Deppipo test. Patients with a Glasgow score  $\leq$  8/15, those with a nasogastric tube, a history of swallowing disorder or cognitive impairment were excluded.

Our study looked at sociodemographic (age, sex, occupation, marital status), clinical (NIHSS, signs of swallowing disorders), paraclinical (brain imaging) and progressive (improvement in swallowing disorder, inhalation pneumonitis and death) characteristics. Anonymous data sheets were used to collect the data, which were then analysed using SPSS software version 21.0. Quantitative variables were expressed as the mean with one standard deviation, and qualitative variables as a percentage. The significance level was set at  $p < 0.05$ .

## Results

From 1<sup>st</sup> July to 31 December 2020, out of 187 patients hospitalized for a stroke confirmed by imaging 81 (43.31%) presented with a swallowing disorder 5(2.67%) patients were excluded, and our study included 76 (40.6%) patients.

Table 1 summarises the socio-cultural and clinical characteristics of the patients. There were 54 women (71.1%) and 22 men (28.9%), with a sex ratio of 0.40. The mean age of the patients was  $57.2 \pm 13.7$  years, with extremes of 25 and 85 years.

**Table 1:** Socio-demographic characteristics of patients.

Socio-professional categories	Workforce	Proportion (%)
<b>Profession</b>		
Housekeeper	43	56,6
Retailer	9	11,8
Workers	7	9,2
Accountant	6	7,9
Men in uniform	5	6,6
Cultivator	3	3,9
Teacher	2	2,6
Student	1	1,3
<b>Age</b>		
25 - 35	1	1,3
36 - 45	9	11,8
46 - 55	21	27,6
56 - 65	22	28,9
66 - 75	18	23,7
76 - 85	5	6,6
Average age	$57,2 \pm 13,7$	
<b>Gender</b>		
Woman	54	71,1
Men	22	28,9
Sex ratio	2,46	
<b>Marital status</b>		
Married	51	67,1
Single	13	17,1
Widow(er)	11	14,4
Divorced	4	5,2

RN: nausea reflex;

**Table 2:** Breakdown of patients according to survival.

Variables	Live 54 (71,0%)	Deaths 22(28,9%)	p-value
<b>Age (years)</b>			
Average	48,5	62,4	0,44
Extremes	25 - 74	56 - 85	
<b>Gender</b>			
Female	30	24	0,44
Male	13	9	
<b>NIHSS</b>			
Average	9,9	14,7	0,13
Extremes	4 - 13	8 - 21	
Pneumopathy inhalation	7	22	$P < 0,001$

Swallowing disorders were diagnosed in 4 patients (5.2%) within 6 hours, between 6 and 24 hours in 23 patients (30.2%) and after 24 hours in 49 patients (64.4%). The NIHSS score on admission ranged from 4 to 21 and the mean NIHSS was  $13.2 \pm 3.4$ . For 41 patients (59.9%) the NIHSS was between 11 and 15. Signs of swallowing disorders were coughing during meals in 53 patients (69.7%), absence of the nausea reflex and lip incontinence, which were present in 40 (52.6%) and 39 (51.3%) patients respectively. Cerebral CT scans without injection of contrast medium revealed 49 cases (64.4%) of ischaemic stroke, 25 cases (32.6%) of haemorrhagic stroke and 2 cases (2.6%) of subarachnoid haemorrhage.

According to the location of the brain lesion, we observed 44 capsular lesions (57.8%), 23 frontal lesions (30.2%) and 16 parietal lesions (21.1%). Progression during hospitalisation was marked by improvement in 37 patients (48.6%) in less than a week and 15 patients (28.8%) between one and two weeks, 10 patients (13.1%) remained stationary and 29 patients developed complications of inhalation pneumonitis. We recorded 22 deaths (28.9%) with a significant association with inhalation lung disease ( $p < 0.001$ ).

## Discussion

Stroke is the leading neurological cause of swallowing disorders. The frequency of swallowing disorders during stroke varies according to the severity of the stroke and the method and period of swallowing assessment. In our study, out of 187 patients hospitalised for a stroke confirmed by brain imaging, 43.31% presented with a swallowing disorder. 2.67% of these patients were excluded and our study focused on 40.60% of patients.

To our knowledge, this study is the first in our context and the third in Africa after the study by Diendere J et al. [10] in Burkina Fasso in 2016 and that of Ndamba BB et al. in Congo Brazzaville in 2017, which reported 37.8% and 26.9% respectively. In Canada in 2005, Martino R et al. [11] in a review of the literature from 1966 to May 2005 reported 40 to 80%.

Females predominated in our study, with a sex ratio of 2.45, and the mean age of patients was  $57.2 \pm 13.7$  years. The lack of information on the benefits of medical follow-up for housewives and the predominance of women in our study are thought to be the reasons for the high presence of housewives. High blood pressure

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was the cardiovascular risk factor in 82.8% of patients. This is in line with the majority of data described in the literature concerning the link between stroke and hypertension, which specifies that hypertension increases the risk of cerebral infarction by a factor of four and that of cerebralhaemorrhage by a factor of ten [12].

The main reasons for consultation were motor deficit and language impairment. These frequent and disabling signs oblige patients to consult a health facility immediately. Our observations are similar to those of TOURE M et al. [13] in Mali, who reported 71.0% hemiplegia and 41.9% aphasia.

Swallowing disorders were mainly manifested by coughing during swallowing and absence of the nausea reflex, with proportions higher than those of Terré R et al. [14] in Spain, who reported 47% coughing and 44% absence of the nausea reflex. The absence of paraclinical examinations to explore swallowing during our study could explain this difference.

The fact that swallowing disorders were detected after 24 hours in 64.4% of patients could be the result of early consultation of other health facilities before ours, transport difficulties or a lack of information on what to do when faced with signs suggestive of a stroke. According to Okubo P.C.M.I et al. in 2012, for a threshold of 12, the NIHSS has a sensitivity of 88% and a specificity of 85% in detecting dysphagia [15].

This represents an additional argument to the results observed in our study, i.e. the risk of swallowing disorders during stroke is proportional to the NIHSS. CT scans without injection of contrast medium were performed in all patients and revealed 57.8% capsular lesions. The presence of the geniculate bundle in the internal capsule and the ineffectiveness of CT in exploring the posterior fossa could explain this result, which contrasts with the data in the literature. The latter report a predominance of truncal lesions during strokes associated with swallowing disorders [16].

Diendere J et al. [10] reported that the prevalence of swallowing disorders was 37.8% on day 0 and 15.8% on day 14, showing that half of swallowing disorders progressed well during the first two weeks, as was the case in our study. The rate of inhalation pneumonitis recorded during our study is higher than that of Martino et al., who estimated the overall frequency of pneumonia in patients with swallowing disorders during stroke at 16% and 19%. This may be due to the fact that during our study, patients were sometimes fed by nurses who were not or insufficiently informed about the method.

Our mortality rate for swallowing disorders during stroke is higher than that of Joundi et al. 2017[17] in Canada who reported 23.7% deaths, but lower than Diendere J et al. [10] who recorded a mortality of 36.2%. These differences could be explained on the one hand by the absence of kinesiorespiratory during our study and on the other hand by the difference in methodology. With a p-value of less than 0.001, our results argue in favour of an increase in

mortality during strokes associated with inhalation pneumonitis. As indicated by Clair et al. [18], who conclude that four out of five deaths during stroke are linked to inhalation pneumonitis.

## Conclusion

Our study shows that swallowing disorders are a frequent complication of stroke. The main symptom is coughing during swallowing. The increase in the NIHSS score is an indicator of swallowing disorders. Inhalation pneumonitis is common and associated with a high mortality rate. The involvement of speech therapists and physiotherapists in the management of swallowing disorders could therefore improve prognosis.

## References

1. Ward EC, Green K, Morton AL. Patterns and predictors of swallowing resolution following adult traumatic brain injury. *J Head Trauma Rehabil.* 2007; 22: 184-191.
2. Forster A, Samaras N, Notaridis G, et al. Assessment and screening of swallowing disorders in geriatric medicine, *NPG Neurology Psychiatry Geriatrics.* 2013; 13: 107-116.
3. Mann G, Hankey GJ, Cameron D. Swallowing function after stroke: prognosis and prognostic factors at 6 months. *Stroke.* 1999; 30: 744-748.
4. Jean-Claude D, Pierre J, Philippe F, et al. Evaluation and management of swallowing disorders. *Nutrition Clinique et Métabolisme.* 2011; 25: 247-254.
5. Corinne B, Anna F. Nutrition and stroke. *Nutrition Clinique et Métabolisme.* 2011; 25: 217-226.
6. Courmont M, Testard MM. Rééducation des troubles de la déglutition par électrostimulation. *Journal de Réadaptation Médicale. Pratique et Formation en Médecine Physique et de Réadaptation.* 2013; 33: 46-50.
7. Ickenstein GW, Höhlig C, Prosiel M, et al. Prediction of outcome in neurogenic oropharyngeal dysphagia within 72 hours of acute stroke. *J Stroke Cerebrovasc Dis.* 2012; 21: 569-576.
8. Flamand-Roze C, Roze E, Denier C. Speech and swallowing disorders in the acute phase of stroke assessment tools and the value of early management. 2012; 3795: 389-466.
9. Bébène Bandzouzi Ndamba, Paul Macaire Ossou-Nguet, Lopresty Luberde Ngouala, et al. Troubles de la déglutition à la phase aiguë un AVC à Brazzaville. 2017; 5204: S133-S208.
10. Diendere J, Millogo A, Preux PM, et al. Évolution de l'nutritionnel et des troubles de la déglutition chez les patients victimes accidents vasculaires cérébraux suivis pendant 14 jours en milieu hospitalier au Burkina Faso. *Nutrition Clinique et Métabolisme.* 2018; 32: 265.
11. Sagui E. les accidents vasculaire cerebraux en afrique subsaharenne. *Med Trop.* 2007; 67: 596- 600.
12. Woimant F. hypertension arterielle et accidents vasculaires cerebraux. *Dossier thematique.* 2003; 12.

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13. Mourad JJ. Severe hypertension: definition and patient profiles. *Rev Prat.* 2013; 63: 672-676.
  14. Terré R, Mearin F. Oropharyngeal dysphagia after the acute phase of stroke: predictors of aspiration. *Neurogastroenterol Motil.* 2006; 18: 200-205.
  15. Okubo PC, Fábio SR, Domenis DR, et al. Using the National Institute of Health Stroke Scale to predict dysphagia in acute ischemic stroke. *Cerebrovasc Dis.* 2012; 33: 501-507.
  16. Flowers HL, Skoretz SA, Streiner DL, et al. MRI-based neuroanatomical predictors of dysphagia after acute ischemic stroke: a systematic review and meta-analysis. *Cerebrovasc Dis.* 2011; 32: 1-10.
  17. Joundi RA, Martino R, Saposnik G, et al. Predictor and Outcomes of Dysphagia Screening after Acute Ischemic stroke. *Stroke.* 2017; 48: 900-906.
  18. Clair B. Traitement des pneumopathies de deglutition correspondance enneurologie vasculaire. 2001; 3.