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Original Article

Prevalence of Aphasia in a Hospital Setting Patients

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Abstract

Objective: We provide the first attempt to quantify the prevalence of aphasia after an ischemic and hemorrhagic stroke and the correlation between the location of the stroke and language ability in Arabic-speaking nations.

Methods: 120 individuals with either an acute or subacute ischemic stroke were included in the research. Following the cases were established (at least 10 days following the onset of stroke), aphasia was diagnosed using the abbreviated Boston Diagnostic Aphasia Examination. Topographic localization of stroke was accomplished by computed tomography and/or magnetic resonance imaging, and potential risk factors for stroke were assessed with regular laboratory tests.

Results: Twenty-three out of a total of 120 patients diagnosed with an ischemic stroke showed signs of aphasia. Patients with aphasia due to ischemic stroke were older than those without it (mean age SD, 54.9± 8.4 vs. 56.1± 6.4; P > 0.05) than those without aphasia. There was no evidence that aphasia increased the likelihood of being homosexual. Only two of the aphasic patients had right ischemia infarction and were left-handed. The percentage of patients with IHD as well as AF was significantly higher in aphasic patients compared to non- aphasic patients, but no other stroke risk factors differed significantly between the two groups.

Conclusion: When compared to previous studies, our findings on the prevalence and precipitating causes of aphasia after stroke are consistent. Ischemic strokes that cause aphasia are more common in those with AF. The two main types of aphasia are global and motor. Aphasia subtypes may be predicted based on the locations of the lesions.

Keywords: Ischemic, stroke, Aphasia, hemorrhag

Introduction

In most parts of the world, stroke is a serious health issue [1, 2]. The majority of individuals will survive their first stroke, although they will often suffer permanent disability as a result. Aphasia is most often brought on by stroke, which damages communication pathways in the brain. The left hemisphere's Broca's and Wernicke's areas, as well as the prefrontal and premotor regions, the lower half of the parietal lobe, and the bottom half of the parietal lobe [3, 4]. However, PET, fMRI, as well as magnetoencephalography all shown that these regions, as well as activation of more distal parts of cortex [5], are uniquely active during language activities.

Aphasia affects anywhere from 21.8% to 38.2% of stroke patients, according to several studies [6, 7]. The yearly incidence of post-stroke aphasia (PSA) is estimated to be between 43,000 and 60,000 per 100,000 people in Europe and the United States, respectively [8-10].

According to research, it has been reported that approximately 20% to 40% of cases of aphasia can be classified as global aphasia. In contrast, only 25% of patients display more conventional types of aphasia, such as Broca's or Wernicke's aphasia. Additionally, around 10% to 15% of patients cannot be classified using standard typologies during the acute stage following a stroke [11].

The goals of this research are to (1) assess the prevalence of aphasia after a first-ever ischemic stroke and (2) examine the connections between aphasia subtype and stroke lesion site in Iraq. For the first time, researchers in Arabic-speaking regions are examining the epidemiology of aphasia.

Metahdology:

The research included 120 cases of ischemic stroke and 20 cases with hemorrhagic stroke. Between the beginning of 2019 and the middle of 2023, they methodically recruited from the outpatient clinic. The WHO defines a stroke as a condition characterised by the sudden onset of clinical indicators of localised or global disruption of brain function, with symptoms persisting for 24 hours or more and no obvious explanation other than vascular origin [12]. Inclusion criteria were patients who exhibited acute or subacute onset of stroke, occurring during the first day to 30 days after its initiation, with or without aphasia. The presence of ischemia infarction was determined using computed tomography of the brain. Individuals who were excluded from participating in this study were patients in a comatose state, those with a history of head injury, individuals with metabolic abnormalities, or neurological conditions other than stroke, and individuals having a history of poor speech or hearing, such as deafness or deaf mutism.

After the diagnosis of stroke was established, each patient had a comprehensive assessment of their medical history and neurological status. This evaluation was conducted within a time frame ranging from at least 10 days after the start of stroke until the conclusion of the first month. The assessment of functional impairment was conducted using two standardised scales: NIHSS [14] and HSS [13]. These scales specifically evaluate motor strength as a measure of functional impairment. The identification of this instance of aphasia was accomplished by the use of the shortened Boston Diagnostic Aphasia Examination Test.

Subsequently, a diagnosis of aphasia was established [15].

Statistical analysis

The data were analyzed by using SPSS version 23 software.

Results:

Twenty-three out of a total of 120 patients diagnosed with an ischemic stroke showed signs of aphasia and 20 patients diagnosed with hemorrhagic stroke. Patients with aphasia due to ischemic stroke were older than those without it (mean age SD, 54.9± 8.4 vs. 56.1± 6.4; $P > 0.05$) than those without aphasia.

There was no evidence that aphasia increased the likelihood of being homosexual. Only 22 of the aphasic patients had right ischemia infarction and 2 were left-handed (Table 1). Four out of a total of 20 patients diagnosed with a hemorrhagic stroke showed signs of aphasia. Patients with aphasia due to hemorrhagic stroke were older than those without it (mean age SD, 54.7± 0.7 vs. 55.3± 2.1; P > 0.05) than those without aphasia. There was no evidence that aphasia increased the likelihood of being homosexual. Only 4 of the aphasic patients had right hemorrhagic infarction and 1 was left-handed (Table 2).

While aphasic individuals had a greater prevalence of IHD and AF, no other stroke risk variables were substantially different from non-aphasic patients (Table 3).

Table 1 The demographic information pertaining to all instances of ischemic stroke cases.

Variable	Total ischemic stroke (120 cases)	Patients with aphasia 23 (19.2%)	Patients without aphasia, 97 (79.8%)	*P* value
Age (mean ± SD)	55.3 ± 1.2	54.9 ± 8.4	56.1 ± 6.4	0.726
Sex (M/F)	56/64	13/15	43/49	0.842
Handedness (RT/LT)	114/6	22/2	92/4	0.693
Duration of stroke onset (days)	27.9 ± 13.4	22.8 ± 14.6	11.2 ± 8.4	0.0002
Education	84/36 (70%/30 %)	17/6 (73.9/26.1%)	67/30 (69.1/30.9%)	0.806

Table 2 The demographic information pertaining to all instances of hemorrhagic stroke cases.

Variable	Total hemorrhagic stroke (20cases)	Patients with aphasia 4 (20%)	Patients without aphasia, 16(80%)	*P* value
Age (mean ± SD)	54.7 ± 0.7	54.6 ± 1.5	55.3 ± 2.1	0.274
Sex (M/F)	9/11	3/3	6/8	0.371
Handedness (RT/LT)	18/2	4/1	15/1	0.418
Duration of stroke onset (days)	26.6 ± 2.59	21.9 ± 3.74	10.9 ± 1.6	0.0001
Education	15/5 (75%/25 %)	3/1 (75/25%)	12/4(75/25%)	0.024

Table 3 The parameter under investigation pertains to the risk variables associated with the presence or absence of aphasia in a sample of 120 individuals diagnosed with ischemic stroke.

Parameter	Total number of cases	Patients with aphasia	Patients without aphasia	*P* value
	(120 cases), *N* (percent)	(23 cases)	(97 cases)	
DM	35 (29.2%)	8 (34.8%)	27(27.8%)	0.246
Smoking	27 (22.5%)	6 (26.1%)	21 (21.6%)	0.368
Obesity	22 (18.3%)	4 (17.4%)	18 (18.6%)	0.411
IHD	9 (7.5%)	5 (21.7%)	4 (4.1%)*	0.001*
AF	12 (10.0%)	6 (26.1%)	6 (6.2%)*	0.011*

IHD, atrial fibrillation: AF, number: N

*Statistically significant

Intriguingly, we discovered that global aphasia (n = 11; 47.8%) was the most prevalent kind of aphasia. Motor aphasia (n = 6; 26%), sensory aphasia (n = 3; 13%), nominal aphasia (n = 1; 4.3%), and conductive aphasia (n = 2; 8.7%) rounded out the spectrum of aphasias (Table 4).

Table 4. Location of ischemic stroke-related aphasia lesions on magnetic resonance imaging in 23 patients

Types of aphasia	No. of cases	percentage
Global aphasia	11	47.8
sensory aphasia	3	13
motor aphasia	6	26
Nominal	1	4.3
Conductive	2	8.7

Discussion:

Aphasia is a prevalent cause of disability in individuals after a stroke. To our knowledge, this is the first research in an Arabic-speaking community to attempt to quantify the prevalence and risk factors of aphasia in individuals who have had an ischemic stroke in Egypt. Estimates on the prevalence of distinct forms of aphasia vary, with some studies suggesting a range of 20-30% [16, 17] and others indicating a near-universal occurrence of nearly 100% [18]. The present study revealed a similar

occurrence (20%) of aphasia in individuals experiencing their first ischemic stroke, consistent with earlier research [9, 19–23]. [10] reported a very high frequency of 80%, whereas [24], [25], and [8] all reported an incidence of 30%. However, [26] found a comparatively low incidence (10.3%).

The present investigation did not find any statistically significant disparity between males and females for the diagnosis or treatment of aphasia. Consistent with previous research [27, 28], we found that educational attainment had no role in the development of aphasia.

Except for 35% of left handers (3% of population) who utilise the right hemisphere for language function, the left hemisphere is entirely the domain of language function [29]. 73.7 percent of the very left-handed people exhibited left-sided cerebral language dominance, 15.8 percent had bilateral cerebral representation, and 10.5 percent were right-sided [29]. The current investigation confirms the findings of the earlier study in which the only two left-handed individuals with aphasia had lesions in the right frontoparietal operculum and insula (MCA area).

Aphasia was more common (22.2 vs. 7.6%) and more severe in patients with atrial fibrillation (AF). Several additional groups have shown similar outcomes [8, 22, 30-32]. Ischemic strokes, especially those of a more severe kind, are more common in people with AF [33–35].

Researchers have observed that cardiovascular abnormalities such CAD, HF, and AF increase the risk of stroke in epidemiological studies [36]. When coronary artery disease (CAD) was present, the age-adjusted 2-year incidence of stroke was more than double, when hypertension was present, it was more than triple, when heart failure (HF) was present, it was more than quadruple, and when atrial fibrillation (AF) was present, it was almost quintuple [37]. Our results suggest that the link between IHD and AF is indirect, since we also discovered a substantial correlation between IHD and poststroke aphasia.

Most participants (47.8%) in this research had global aphasia, followed by motor (26%), and then sensory (13%). Only 8.7 percent of those tested had conductive aphasia, while 4.3 percent had nominal aphasia. Similar to previous research [30, 37], we discovered that motor and global aphasia are the most common forms of the disorder.

In our research, individuals with global aphasia tended to have severe damage to the whole MCA supply area, which included both cortical and subcortical structures.

Conclusions:

The incidence, risk factors, and lesion location of post-stroke aphasia are comparable across Western languages and Arabic, despite significant variances between the two.

Although our findings are generally in agreement with those of other studies [35, 37] that found that the location of lesions was both correlated with and predictive of the aphasia type, the distribution pattern of brain injury had a significant degree of overlap with the various types of aphasia, yielding some surprising results.

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