DOI:10.26744/rrttlc.2026.12.1.10

Abilități de comunicare după accident vascular verebral în emisfera dreaptă: Studiu de caz utilizând Testul de Comunicare Lille (TLC)

Communicative Abilities After Right-Hemisphere Stroke: Case Study Using the Lille Communication Test (TLC)

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Abstract

This study examines the communicative abilities of a right-handed patient who experienced a right-hemisphere stroke, using the Lille Communication Test (TLC), adapted for the Algerian linguistic and sociocultural context. A descriptive single-case methodology is employed to evaluate verbal and non-verbal communicative performance in the absence of aphasia. The adapted TLC enabled a multidimensional assessment of communicative behaviour, encompassing attentional, verbal, and non-verbal components. Findings revealed preservation of structural aspects of language, including phonological, lexical, and syntactic domains, as well as mild prosodic impairment and subtle pragmatic features. In contrast, pronounced difficulties were observed in the non-verbal domain, particularly in the comprehension and production of symbolic and ideational gestures. These outcomes are consistent with established neurolinguistic evidence indicating the right hemisphere's role in prosody, pragmatics, and non-verbal communication.

Keywords: Right hemisphere stroke; communicative abilities; Lille Communication Test (TLC)

Introduction

Cerebrovascular accidents (CVAs), commonly referred to as strokes, are among the most prevalent neurological disorders, causing diverse impairments in language, cognition, and neuropsychological functioning. These impairments include aphasia, frontal lobe syndromes, executive dysfunction, apraxia, verbal and motor dyspraxia, and memory disturbances, among others. Strokes may affect either the left or right cerebral hemisphere, as well as subcortical structures such as the brainstem, and may occasionally result in diffuse cerebral injury.

In right-handed individuals, lesions of the left hemisphere are classically linked to aphasia and other neuropsychological disturbances, including perceptual agnosia and apraxia, often accompanied by right hemiplegia, indicating involvement of motor areas. Doutriaux (2023) reports that approximately 21% to 38% of individuals post-stroke exhibit aphasia, defined as an acquired disorder of language that affects expressive and/or receptive abilities in both oral and written modalities. These deficits arise from lesions to cortical and subcortical regions and to the functional neural networks responsible for language processing.

Neuroscientific investigations (Cambier et al., 2024) consistently affirm the predominance of left-hemisphere lateralisation of language areas in approximately 95% of right-handed individuals, with rare exceptions such as crossed aphasia or aphasia in left-handed individuals (Bouridah, 2024).

Moreover, individuals with aphasia frequently display additional neuropsychological and psychomotor deficits, including hemiparesis, apraxia,

visuospatial neglect, executive dysfunction, and impairments in working memory.

The advent of cognitive neuroscience, in conjunction with linguistic modelling and theories of language information processing, has further enriched the analysis of aphasia, particularly through the integration of neuroimaging modalities such as functional magnetic resonance imaging (fMRI) and intraoperative brain mapping (Bouridah, 2021).

From a clinical perspective, individuals diagnosed with aphasia are typically referred for speech and language therapy, which aims to restore communicative competence and enhance interactional skills in daily living. The discipline of speech and language pathology provides a wide range of tools and standardised assessments that assist clinicians in the evaluation and management of post-stroke aphasia and associated communicative disorders.

Despite substantial attention in the literature and clinical practice to aphasia resulting from left hemisphere lesions, there remains a marked scarcity of research on communication disorders following right hemisphere strokes. Accordingly, the present study seeks to address this lacuna by characterising the communicative profile of a patient with a right-hemisphere stroke, with particular focus on verbal and nonverbal communicative competencies, as assessed by the Lille Communication Test (TLC), adapted for the Algerian linguistic environment.

Clinical and neurolinguistic literature has historically prioritised investigating the linguistic and communicative sequelae associated with left-hemisphere strokes, whereas systematic inquiry into right-hemisphere lesions remains relatively limited. Nevertheless, both clinical observation and empirical research consistently demonstrate that damage to the so-called minor hemisphere often results in a constellation of cognitive-communicative disturbances collectively referred to as Right Hemisphere Syndrome.

As outlined by Blake (2018), Cazzoli et al. (2023), and Gallet et al. (2022), these manifestations include unilateral spatial neglect, visuospatial constructional disorders, hemiasomatognosia, anosognosia, and additional deficits that depend on the lesion's location and extent. Despite these well-documented perceptual and attentional impairments, the linguistic and communicative consequences of right-hemisphere injury remain insufficiently characterised compared with left-hemisphere aphasia. To date, researchers have not reached consensus on the existence of distinct right-hemisphere language syndromes or the precise phenomenology of associated communicative disruptions.

Initial descriptions by Eisenson (1962) suggested that right-hemisphere lesions may modify linguistic behaviour even in the absence of aphasia. Subsequent studies by Lecours and Lhermitte (1979) and Lecours (1991) reported nuanced linguistic deviations following right-hemisphere insult. Joanette et al. (1983) identified atypical narrative discourse structures, and Blake (2018) documented

reductions in functional communicative efficacy. Other investigations, such as those by Bartels-Tobin and Hinkley (2005), Champagne and Taché (2016), and Cordonier (2023), highlighted disturbances in narrative cohesion, pragmatic inferencing, and discourse prosody.

Ferré and Joanette (2024) emphasised that evaluating pragmatic and conversational skills often reveals clear impairments, despite intact grammar and lexical abilities. Rousseaux and Daveluy (2016) and Joanette (2004) further identified monotonic prosody, deficits in social discourse, and difficulties in comprehending humour, irony, and indirect speech. Such patients generally preserve the formal linguistic framework, including phonology, morphology, syntax, and semantics, while manifesting subtle yet significant pragmatic and prosodic impairments that impede everyday communication.

Clinical experience in Algerian contexts corroborates these findings. Cases involving right-hemisphere damage often exhibit flattened prosody, disorganised conversational turn-taking, and sporadic echolalia. These features parallel the mild but pervasive neuropragmatic impairments described by Steamer and Cohen (2001), Champagne et al. (2022), and Bouridah (2024). Pragmatic dysregulation often manifests as premature topic shifts or lapses in conversational focus, a phenomenon observable in pragmatic-function assessments but inconsistently captured by standardised instruments such as the Lille Communication Test (TLC) (Rousseaux et al., 2001).

Epidemiological evidence from Roussel et al. (2017) indicates that approximately 50% of individuals with right-hemisphere damage exhibit one or more of these communicative impairments. Non-verbal modalities, including intonation, prosody, facial expression, gesture imitation, and gaze orientation, are particularly vulnerable (Chantraine & Rousseaux, 2019). Additionally, Ferré and Joanette (2016) observed that haemorrhagic lesions typically produce more pronounced communicative deficits than ischaemic lesions, although both categories display prosodic and ocular-gaze abnormalities.

The need for differential diagnosis is paramount. Although most right-hemisphere communication disorders are non-aphasic, a minority of right-handed patients (1–10%) may develop crossed aphasia (aphasie croisée) following right-hemisphere injury (de Partz & Pillon, 2014). Such presentations typically involve right hemiplegia and concomitant neuropsychological symptoms.

Grounded in these theoretical and clinical insights, the present study investigates the verbal and non-verbal communicative capacities of a right-handed patient with a right-hemisphere ischaemic stroke and no aphasia, using the culturally adapted Lille Communication Test (TLC). The principal research question addressed is:

Does a right-hemisphere stroke patient without aphasia demonstrate measurable communication deficits when assessed using the adapted TLC analytical grid?

Methods

Research Design

This study employs a descriptive single-case methodology, particularly appropriate for examining the detailed linguistic and communicative profile of an individual presenting with right-hemisphere brain damage. The qualitative–quantitative approach enabled an in-depth analysis of both verbal and non-verbal communication domains through a structured analytical framework derived from the Lille Communication Test (TLC).

A semi-structured clinical interview was conducted with the patient and a close family member to obtain medical, neurological, and psychosocial background information. These data informed the development of a comprehensive neuropsycholinguistic profile that integrated neuroimaging results, cognitive-behavioural characteristics, and communicative performance.

Participant

The participant, identified as M.R., is a 62-year-old right-handed male, married, and father of three. He completed secondary education and was employed as a trader. His primary language of daily communication is Algerian Arabic.

Neurological Findings

Neuroimaging in January 2024 revealed an ischaemic stroke affecting the superficial territory of the right middle cerebral artery. Clinical manifestations included left hemiparesis, predominantly affecting the face and upper limb, as well as dysphagia. The patient was referred by his rehabilitation physician for a speech-language evaluation addressing swallowing difficulties and visuospatial impairments.

Speech-Language Assessment Data

Initial language assessment indicated the absence of expressive or receptive aphasia. However, mild excessive verbal output and prosodic monotony were noted. Neuropsychological examination identified left unilateral spatial neglect, disturbances of body schema, and ideomotor apraxia. Despite mild anxiety, the patient remained cooperative, attentive, and engaged throughout the assessment.

General Behavioural Observation

The patient exhibited mild anxiety but demonstrated adequate cooperation and responsiveness during both the clinical interview and the speech-language examination.

Instrument

Lille Communication Test (TLC)

The Lille Communication Test (TLC) (Rousseaux et al., 2001) is a standardised clinical instrument designed to assess verbal and non-verbal communicative abilities in adults with acquired brain injury. It provides a multidimensional evaluation of communicative efficiency across three principal domains: motivation and attention to communication, verbal communication, and non-verbal communication.

For this study, the TLC was linguistically and culturally adapted to the Algerian context (Bouridah, 2023). The adaptation followed the psychometric principles used in developing the original French version,

ensuring validity and reliability. The standardisation sample comprised 48 adults (24 women and 24 men) aged 20 to 80 years.

Only minor linguistic adjustments were necessary for the first two sections, which assess communicative intent and verbal interaction, as these rely on semi-structured dialogue centred on personal and general topics. In contrast, the third section, which evaluates non-verbal communication, required modification of the pictorial stimuli originally derived from the PACE method (Promoting Aphasic Communicative Effectiveness).

The images were replaced or adapted to reflect culturally familiar Algerian contexts, based on expert consensus from 15 judges specialising in psychology, speech-language pathology, and sociolinguistics. The revised materials were subsequently piloted to confirm clarity and ecological validity.

Procedure

The adapted TLC was administered during an individual clinical session lasting approximately 90 minutes.

Section A (Attention and Motivation) assessed the patient's willingness to engage in dialogue, responsiveness to greetings, and initiative in sustaining conversational exchange.

Section B (Verbal Communication) consisted of semi-structured discussions on everyday topics related to the patient's interests, educational background, and life experience. This section evaluated speech rate, intelligibility, lexical access, syntactic organisation, and pragmatic management, including topic maintenance, feedback provision, and repair strategies.

Section C (Non-Verbal Communication) was based on the modified PACE procedure and used 38 culturally adapted images, divided into two sets. During the first phase, the examiner maintained a neutral stance while the patient conveyed target information using any available communicative modality (verbal or gestural). In the second phase, the examiner used gestures to assess the patient's comprehension and interpretation of non-verbal cues.

Results

Case Results using the TLC (Algerian Version)

Table 1 presents the results of the TLC verbal and non-verbal communication assessment for case M.R

Attention and Desire for Communication grid		
Item	Response	Score
Greeting Behavior	Responds to the examiner's greeting	1/2
Attention to Dialogue	Very attentive to the dialogue with the examiner	2/2
Contribution to Interaction	Contributes after being prompted by the examiner	1/2
Total for Attention and Desire for Communication Grid	4/6	
Verbal communication grid		
Item	Response	Score

Comprehension of Spoken Language	Absence of comprehension disorders that impede dialogue and exchange	4/4
Speech Fluency	Excessive speed	1/2
Speech Clarity	Clear	2/2
Word Finding Difficulty (Anomia)	Not present	2/2
Paraphasia	Not present	2/2
Syntax and Grammar	Syntactic difficulties, but do not compromise the information	1/2
Answering Open-Ended Questions	Answers are clear	2/2
Maintaining the Topic of Conversation	Yes	2/2
Introducing New Information	Yes	2/2
Introducing New Topics	Yes	2/2
Logical Organization of Discourse Units	Yes	2/2
Adjusting discourse according to the listener's knowledge	Yes	2/2
Verbal feedback showing difficulty in understanding	Yes	2/2
Modifying Speech when the Specialist Indicates Lack of Comprehension	Yes, the patient modifies speech when the specialist indicates a lack of comprehension	2/2
Use of Written Language	No	/
Total for Verbal Communication Grid	28/30	
Non- verbal communication grid		
Understanding of Gestures and Gaze	Yes	1/1
Understanding of Symbolic Movements	No	0/1
Understanding of Object Shape Representation	No	0/1
Understandin of object/Action Use Representation	No	0/1
Understanding of Non-Verbal Expressions Indicating a Physical or Emotional State	Yes	1/1
Non-Verbal Expression (The person expresses their feelings non-verbally)	No	0/3
Interactive Pragmatic Level: Through Appropriate Prosody (Intonation)	No	0/1
Using organized/regulated eye gaze	Yes	1/1
Regulatory nonverbal gestures	No	0/1
Turn-taking respect	Yes	1/1
Non-Verbal Lexical Level: Spontaneous Recourse to Non-Verbal Communication	No	0/2

Deictic gestures or deictic gaze	No	0/2
Production of Symbolic Movements	Yes, but lacking precision	1/2
Production of Object Use Movements	Yes, but lacking precision	1/2
Representation of Object Shapes	Yes, but lacking precision	1/2
Using gestures to express physical or emotional states	Limited by execution deficits	1/2
Ideational/Conceptual Level: Movements or Gestures Using the Conversation Referent	No	0/2
Production of Non-Verbal Reactions to Indicate Difficulty Understanding the Interlocutor	No	0/2
Speech Adjustment when the Interlocutor Indicates Signs of Non-Comprehension	Yes	2/2
Use of Drawin	No	
Total for Non-Verbal Communication Grid	10/30	

The table above presents the results for case M.R., using the verbal and non-verbal communication analysis grid of the TLC test, as adapted for the Algerian context (Bouridah, 2023), and structured according to the three principal axes of the communication process.

The patient achieved a score of 66.66% on the first axis. Although he does not initiate communicative exchanges or actively engage in dialogue, he consistently demonstrates attentiveness to the interlocutor and genuine interest in the communication process by responding appropriately to the examiner's prompts.

Despite achieving a notably high score of 93.33% on the verbal communication axis, specific difficulties related to dysprosody were observed, particularly impairments in intonation and prosodic modulation, alongside a marked acceleration in speech rate. These difficulties do not affect the semantic integrity of the verbal message.

Further analysis reveals a minor difficulty in managing syntactic and morphological structures. However, this challenge neither distorts the overall meaning of the discourse nor undermines its semantic intent.

Assessment of the pragmatic dimension, specifically its verbal aspect, revealed no deficits on any of the relevant items.

Within the domain of non-verbal communication, the findings indicate pronounced difficulties, particularly in interpreting symbolic gestures and comprehending actions involving object use, as depicted in visual stimuli. There is also either an absence or an inaccuracy in the production of gestural movements.

Discussion

The behavioural pattern observed on the first axis highlights the patient's readiness to participate in interaction and his recognition of communicative cues, echoing findings reported by Blake (2018), who emphasises the frequent challenges patients encounter in initiating dialogue.

The prosodic impairments identified in verbal communication are well supported

by established research on language and communication in individuals with Right Hemisphere Stroke (RHS). Steamer and Cohen (2001) and Champagne (2022) have both identified prosodic and intonational disturbances as relatively mild yet characteristic deficits affecting verbal communication in this population.

The minor syntactic and morphological difficulties observed in this case align with the conclusions of Joanette (2004), who found that formal linguistic components, including phonetic, phonological, lexical, and grammatical/syntactic abilities, generally remain preserved in RHS patients. When disruptions occur at these levels, they typically do not compromise the intended message or communicative efficacy of the discourse.

The absence of verbal pragmatic deficits in case M.R. aligns with the findings reported by Rousseaux et al. (2001), whereas those of Steamer and Cohen (2001) and Blake (2018) documented pragmatic impairments, particularly difficulties sustaining the conversational topic. This discrepancy may be attributable to methodological differences, as Rousseaux et al. (2001) employed assessment tools comparable to those used in the present study, whereas Steamer and Cohen (2001) relied on distinct instruments targeting communicative and pragmatic functions.

The observed nonverbal communication impairments are consistent with the conclusions drawn by Rousseaux (2001), Joanette (2004), and Chantraine and Rousseaux (2019). These results may reflect a weakness in the mental representation of movements and gestures, or a disruption in their organisation and execution. These issues are closely associated with clinical phenomena such as ideomotor apraxia and unilateral spatial neglect, which are frequently observed in the neuropsychological profiles of individuals with right hemisphere lesions.

Notably, the absence of spontaneous reliance on nonverbal communicative strategies may reflect either the patient's significant challenges in the nonverbal domain or his relative success in achieving effective communication through verbal means alone, thereby reducing the need for nonverbal compensatory strategies.

Conclusion

Cerebrovascular accidents have a detrimental impact on an individual's linguistic and communicative capacities, often resulting in aphasia when the left hemisphere is affected, particularly among right-handed individuals. Numerous investigations have explored various dimensions of aphasia. Among studies focusing on language and communication following right hemisphere injury, findings indicate the presence of certain disorders that are frequently described as subtle, mild, or nuanced. These include prosodic and intonational impairments, as well as difficulties with non-literal aspects of language and challenges at the pragmatic and ideational levels of communicative functioning.

Within this framework, the present study investigated both verbal and nonverbal communicative abilities in a right-handed individual with a right-hemisphere stroke, utilising the communication analysis grid from the Algerian adaptation of the TLC test. The findings demonstrated prosodic and communicative disturbances, as well

as minor grammatical or morphological difficulties, within the verbal communication domain, while most other linguistic levels remained essentially preserved. Regarding nonverbal communication across its dimensions, the study identified notable deficits in the comprehension, representation, and execution of gestures and symbolic and ideational movements.

As a result, the patient with right hemisphere stroke manifested pronounced non-verbal communication disorders, whereas the verbal dimension remained largely intact or displayed only minor impairments that did not compromise the core meaning of the message or the overall effectiveness of communicative acts. Nonetheless, the current investigation is restricted to a single-case design. Although its findings are in line with those of several preceding studies and also present distinctive results relative to some, there is a need for research encompassing broader samples or groups that are representative of the general population, to enable wider generalisation and in-depth analysis.

Future research should pursue comparative studies that take into account the specific nature of the cerebrovascular accident and the characteristics of the brain injury. Moreover, it is recommended that future studies focus on the management of speech-language therapy for individuals with right hemisphere injury, along with a comprehensive evaluation of all associated linguistic, communicative, and related neurocognitive functions.

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