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RESEARCH ARTICLE

Communication Related Quality of Life in Patients with Different Types of Aphasia Following a Stroke: Preliminary Insights

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Abstract

It is well known that stroke and aphasia can seriously affect communication related quality of life (QoL). What has been less examined is whether communication QoL differs in relation to qualitatively different forms of aphasia. The aim of this exploratory study was to investigate this possibility in four patients with aphasia caused by stroke: two with Broca's and two with conduction aphasia. The quality of communication life scale (QCL) was administered in the chronic phase after stroke, alongside other aphasia assessments. All participants showed overall a relatively good Quality of Communication Life according to QCL. The patient with severe conduction aphasia demonstrated lower scores in all examined life domains compared to the patient with severe Broca's aphasia suggesting that it might be worthwhile in future to investigate differential effects on QoL of different aphasia profiles.

Keywords

Communication quality of life, Aphasia, Stroke

Introduction

Aphasia is typically defined as a language disorder that results from damage to the parts of the brain responsible for language processing (usually, but not exclusively, in the left hemisphere). People with aphasia may lose the ability (totally or partially) to formulate, produce and comprehend spoken and written language. Aphasia can be caused by any disease or damage to the parts of the brain that control language. Stroke is the most frequent cause of aphasia. In around 80% of people who have aphasia, this is the etiology. The incidence of aphasia after stroke is about 30% [1-3].

Different patterns of recovery from aphasia have been shown. Vukovic, Vuksanovic, Vukovic [4] found that only two patients in a group of 34 stroke patients with aphasia had totally recovered language six months post-onset. In later stages, the percentage of patients who were fully recovered is higher. It was shown that about one third of stroke survivors with aphasia have recovered from aphasia 12 to 18 months post-onset, whereas about 60% remain chronically aphasic [2,5,6].

According to symptoms and localization of the brain lesion, aphasia can be categorized into different syndromes. The classical syndromes of aphasia as defined by the Boston school [7] are: Global aphasia, Broca's aphasia, Wernicke's aphasia, conduction aphasia, anomic aphasia, transcortical motor aphasia, transcortical sensory aphasia and mixed transcortical aphasia [3,8,9], though this classification has given way to more recent emphasis on patterns of breakdown within cognitive, neuropsychological models of language breakdown and more fine-grained lesion studies [10,11]. However, regarding the objective of this paper, the focus is on individuals with Broca's aphasia and conduction aphasia as defined by Goodglass, et al. based on the Boston Diagnostic Aphasia Examination [7].

Broca's Aphasia is said to be characterized by non-fluent, sparse and effortful speech output, with reduced phrase length and syntactic complexity, and awkward articulation [3,9]. The dominant feature of Broca's aphasia is agrammatism. During language production, agrammatic patients predominantly use content words (nouns and main verbs), giving the well-known impression of telegraphic speech, and associated problems producing full sentences. In its more severe form, spoken utterances may be reduced to single words. Patients with Broca's aphasia also have word-finding difficulties,

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as well as repetition and reading aloud impairment. Auditory comprehension is relatively good in a conversation, but patients show mild to moderate impairment when comprehension of syntactic structure is necessary. Reading comprehension generally parallels auditory comprehension. Writing can be severely impaired. Among other signs and symptoms, patients with Broca's aphasia often present with oral or ideomotor limb apraxia and right hemiparesis [8]. Typical lesion sites involve the (left) frontal lobe, including frontal operculum, premotor and motor regions, as well as subcortical structure [12].

Conduction aphasia is a type of so-called fluent aphasia with a prominent impairment in repetition of words and phrases alongside relatively spared auditory comprehension [3,9]. The patient may be able to express him- or herself fairly well, but speech flow is frequently interrupted by phonemic paraphasias. Being aware of this, patients make successive attempts to correct output using trial and error behavior, giving the familiar picture of conduits d'approche. Errors in repetition as well as those in naming and spontaneous speech are primarily phonological. In addition, patients with conduction aphasia have difficulties in word finding; impaired writing and reading aloud. Reading comprehension is relatively preserved.

The lesion sites commonly associated with conduction aphasia are left arcuate fasciculus, supramarginal gyrus, insula and its subcortical white matter [12,13]. Other associated signs and symptoms in patients with conduction aphasia may include ideomotor apraxia, but motor and/or sensory deficits can also be present [8].

Considering that ability to communicate is a fundamental human function, aphasia as language impairment may result in considerable activity limitation [14] and participation restriction in all life domains [15].

Many researchers reported that aphasia negatively affects quality of life [16,17]. Quality of life of people with aphasia is significantly worse than that of non-aphasic stroke patients and healthy controls. It has also been reported that quality of life in patients with aphasia improves over time but still remains below that of healthy people [18]. However, some studies show decreasing quality of life over time [19]. Furthermore, some authors found that people with chronic, severe aphasia have a very low level of quality of life [20].

In addition, data show that impact of the language impairment and other factors on HRQL following aphasia, was negatively affected by emotional distress/depression, severity of aphasia and communication disability, other medical problems, activity limitations, and aspects of social network and support [21]. Furthermore, aphasia can cause frustration and feelings of loneliness and alienation [22,23]. However, some data drawn from qualitative studies showed that people with aphasia can have successful lives where they have participation, meaningful relationships, support, opportunity for and facilitation of communication, positivity, independence and autonomy, and see living successfully with aphasia as a journey over time [24].

What the studies to date have largely neglected is whether the type of aphasic disturbance has an influence on QoL in people with aphasia. The aim of this exploratory study was to examine whether there is a case for investigating differences in Quality of Communication life in patients with Broca's and Conduction aphasia, or any other groups of people with varying presentation of aphasia. We expected that there would be differences in Quality of Communication between people with Broca's aphasia and those with conduction aphasia based on different types of impairment. In addition, we expected that people with mild form aphasia would have higher average scores on the overall scale than those with severe aphasia.

Methodology

Participants

Four patients with aphasia after stroke participated in this study. Their general details appear in Table 1. They were recruited from hospital outpatient clinics according to the following in- and exclusion criteria. They were: Over 18 years age, had a single left hemisphere stroke, were right-handed, able to give informed voluntary consent to join in the research. Exclusion criteria were: No dementia or other condition apart from the stroke likely to impact on language and communication. Hence, we excluded people with severe comprehension deficit (mean of percentiles on 4 auditory comprehension subtests on the BDAE below 50).

The control group included 4 non-brain-damaged individual matching the people with aphasia according to gender, age, occupation, years of education and marital status. Two individuals in the control group were working, the others were retired pensioners.

Table 1: Biographical information and neurological profiles of patients with aphasia.

Participant	Gender	Age*	Marital status	Occupation	Education*	Type of aphasia	Severity of aphasia	TPO**	Hemiparesis
DB	f	52	married	bank clerk	14	Broca's aphasia	mild	3,6	None
LM	f	63	widow	dentist	17	Broca's aphasia	severe	10,2	R
GD	f	68	married	translator	16	Conduction aphasia	mild	0,8	None
ZH	f	66	divorced	administrative	12	Conduction aphasia	severe	0,9	None

*Years; **TPO: time post-onset (years, months).

Note: Patients with aphasia: DB, LM, GD, ZH.

Table 2: Biographical information of control group.

Participant	Gender	Age*	Marital status	Occupation	Education*
NM	f	52	married	economist	14
KS	f	60	widow	dentist	17
TD	f	68	married	translator	16
AJ	f	66	divorced	administrative	12

*Years.

Note: Control group: NM, KS, TD, AJ.

Table 3: BDAE individual percentiles.

		Type of aphasia					
		Broca		Total	Conduction		Total
BDAE Subtests		LM	DB		ZH	GD	
Severity Rating		20	90	55	60	90	75
Conversation/Expository Speech	Simple social responses	50	100	75	50	100	75
Fluency	Articulation rating	30	80	55	40	70	55
	Phrase length	20	30	25	50	70	60
	Melodic line	20	60	40	50	60	55
	Grammatical form	20	80	50	70	100	85
Auditory Comprehension	Word discrimination	70	100	85	70	100	85
	Body-part identification	60	90	75	70	90	80
	Commands	40	80	60	70	90	80
	Complex ideational material	30	80	55	60	90	75
Naming	Responsive naming	40	100	70	80	100	90
	Confrontation naming	50	90	70	50	90	70
	Animal naming	70	90	80	70	90	80
Oral Reading	Word reading	60	90	75	60	90	75
	Oral sentence reading	60	85	72.5	70	90	80
Repetition	Repetition of words	40	90	65	40	90	65
	High-probability	50	70	60	30	70	50
	Low-probability	40	80	60	40	80	60
Paraphasia	Literal	50	80	65	10	40	25
	Verbal	70	90	80	60	90	75
Automatic Speech	Automatized sequences	50	100	75	60	100	80
Reading Comprehension	Symbol discrimination	70	70	70	70	70	70
	Word recognition	80	80	80	80	80	80
	Comprehension of oral spelling	70	100	85	70	90	80
	Word-picture matching	60	80	70	60	80	70
	Reading sentences and paragraphs	50	90	70	60	90	75
Writing	Mechanics	40	80	60	50	90	70
	Serial writing	50	90	70	60	80	70
	Words to dictation	70	90	80	70	90	80
	Sentences to dictation	70	90	80	70	90	80
	Narrative writing	20	90	55	20	80	50

Note: Patients with aphasia: DB, LM, GD, ZH.

Aphasia type and severity classification followed assessment with the Boston Diagnostic Aphasia Examination (BDAE, [7]). We included two people with Broca's type aphasia (BDAE definition), one mild one severe aphasia and similarly two with conduction aphasia, one mild one severe.

The patient with severe Broca's aphasia was a widow, living with her family, but in a flat (room, kitchen and bathroom) just for her. She prepares breakfast and dinner by herself, but she eats lunch with the family (her son and his wife prepare lunch for her). She is a pensioner. The patient with mild Broca's aphasia was married and she lives with her husband in their home. She has returned to her previous work as a bank clerk. The patient with mild conduction aphasia also is married and she lives in their home. The patient with severe conduction aphasia is single (divorced) and she lives with her brother who also is single. They live in her home. Both patients with conduction aphasia are pensioners. All patients agreed to test and their families gave permission to conduct research. (Table 1 and Table 2).

Instruments and Procedure

The Quality of Communication Life Scale - QCL [25] was designed to assess various aspects of communication and to determine the impact of language and speech disorder on adult's ability to participate in society. The QCL scale consists of 18 items - statements to

which the respondent can give a score from 1 to 5. If the individual fully agrees with the statement numeric value is 5, and if he or she does not agree the value is 1, with the possibility to select scores between these extremes. The final score derives from adding the ratings for statements 1-17 and calculating the mean rating. Statement 18, namely, "In general, my quality of life is good", was considered in isolation and was recorded by the numerical value attributed by the respondent. The statements were classified into several domains.

The following domains are included: 1. Socialization/ Activities (7 statements); 2. Confidence/Self-Concept (6 statements); 3. Roles and Responsibilities (4 statements); 4. General Well-Being (one general statement about quality of life).

Alongside the QCL patients completed the BDAE and attended informal interviews concerning their circumstances and recovery from aphasia and stroke. The patients were tested at home by a speech-language pathologist.

Results

Table 3 BDAE individual percentiles.

Data presented in the Table 3 show that language performance and deficits are in keeping with the characteristics of Broca's aphasia and conduction aphasia. The obtained results indicate differences between the two cases of severity of aphasia.

The results of the examination of the quality communication life (QCL) for participants of aphasia are presented in Table 4.

The results of the examination of the quality communication life (QCL) for the control group are presented in Table 5.

The results of the examination of different domains of communication life for participants of aphasia are presented in Table 6.

The results of the examination of different domains of communication life for control group are presented in Table 7.

As regards the QCL results showed that the patient with mild Broca's aphasia achieved higher score in three out of the 18 statements and only in the domain of Roles and Responsibilities, compared to the patient with severe Broca's aphasia, but the latter patient had higher scores in seven statements and in the domains of Confidence/Self-Concept and General Well-Being. On the other hand, the patient with mild conduction aphasia had higher scores in nine statements and in all domains except the Confidence/Self-Concept, compared to the patient with severe conduction aphasia. Comparing the scores between the patient with severe Broca's and severe conduction aphasia, we can see that the former patient had higher scores in seven statements and in all domains except Confidence/Self-Concept, where both had the same score. On the other hand, the patient with mild conduction aphasia had higher scores on six statements and in the domains of Socialization/ Activities and General Well-Being (In general quality of life) compared to the patient with mild Broca's aphasia (Table 4 and Table 6).

Table 4: Total and mean scores of quality of communication life scale for participants with aphasia.

Number of item	Item	Type of aphasia			
		Broca		Conduction	
		LM (severe)	DB (mild)	ZH (severe)	GD (mild)
1	I like to talk with people	5	3	5	5
2	It's easy for me to communicate	4	4	4	3
3	My role in the family is the same	3	5	4	5
4	I like myself	5	4	5	5
5	I meet the communication needs of my job or school	2	5	4	3
6	I stay in touch with family and friends	5	5	3	5
7	People include me in conversations	4	5	4	5
8	I follow news, sports, and stories on TV/movies	4	4	4	5
9	I use the telephone	5	5	4	5
10	I see the funny things in life	5	4	4	4
11	People understand me when I talk	4	4	3	4
12	I keep trying when people don't understand me	5	4	5	4
13	I make my own decisions	5	5	5	5
14	I am confident that I can communicate	5	4	5	3
15	I get out of the house and do things	4	3	3	4
16	I have household responsibilities	5	5	3	5
17	I speak for myself	4	4	5	5
Total:		74	73	70	76
Items scored:		17	17	17	17
Mean score overall:		4.35	4.29	4.12	4.41
18	In general, my quality of life is good	4	3	3	4

Note: Patients with aphasia: DB, LM, GD, ZH.

Table 5: Total and mean scores of quality of communication life scale of control group.

Number of item	Item	Participants			
		NM	KS	TD	AJ
1	I like to talk with people	5	5	5	5
2	It's easy for me to communicate	5	5	5	5
3	My role in the family is the same	5	5	5	5
4	I like myself	5	5	5	5
5	I meet the communication needs of my job or school	5	5	5	5
6	I stay in touch with family and friends	5	5	5	5
7	People include me in conversations	5	5	5	5
8	I follow news, sports, and stories on TV/movies	5	5	4	5
9	I use the telephone	5	5	5	5
10	I see the funny things in life	5	5	5	5
11	People understand me when I talk	5	5	5	5
12	I keep trying when people don't understand me	5	4	5	5
13	I make my own decisions	5	5	5	5
14	I am confident that I can communicate	5	5	5	5
15	I get out of the house and do things	5	5	5	5
16	I have house hold responsibilities	5	5	5	5
17	I speak for myself	5	5	5	5
Total:		85	84	84	85
Items scored:		17	17	17	17
Mean score overall:		5	4.94	4.94	5
18	In general, my quality of life is good	5	5	5	5

Note: Control group: NM, KS, TD, AJ.

Table 6: The results of the examination of different domains of communication life for participants with aphasia.

Domain	Broca's			Conduction aphasia		
	DB (mild)	LM (severe)	Mean	GD (mild)	ZH (severe)	Mean
Socialization/Activities	4.14	4.14	4.14	4.43	3.86	4.15
Confidence/Self-Concept	4	4.67	4.34	4.67	4	4.34
Roles and Responsibilities	5	4.5	4.75	5	3.75	4.38
General Well-Being (In general, quality of life)	3	4	3.5	4	3	3.5

Note: Patients with aphasia: DB, LM, GD, ZH.

Mean value (max 5 positive agreement) on different domains of the communication life in patients showed that the patients with both type of aphasia (Broca's and conduction) have communication difficulties in all examined domains of life. Both groups of patients pointed out that their quality of life, in general, is not satisfactory (Table 4 and Table 6). The patients with aphasia achieved lower scores compared to the control group, which confirms that they have low quality of life related to communication. All the subjects from the control group achieved maximum score (5) on all statements on the scale, except one subject who gave lower score on one statement from the domain of Socialization/Activities and one patient who gave lower score on one statement from the Confidence/Self-Concept (Table 5 and Table 7).

Table 7: The results of the examination of different domains of communication life of control group.

Domain	Participants			
	NM	KS	TD	AJ
Socialization/Activities	5	5	4.85	5
Confidence/Self-Concept	5	5	5	4.83
Roles and Responsibilities	5	5	5	5
General Well-Being (In general, quality of life)	5	5	5	5

Note: Control group: NM, KS, TD, AJ.

Discussion

The aim of this study was to examine quality of communication life in chronic patients with Broca's aphasia versus those with conduction aphasia. The results show that both groups of patients expressed some dissatisfaction with their quality of communication life. Patients with conduction aphasia had lower scores in all examined domains (except Roles and Responsibilities) than patients with Broca's aphasia, though in the small sample studied here it was not possible to ascertain whether these were statistically significant. We assume that these finding came from differences between clinical profiles of these two types of aphasia. This suggests there may be a case for conducting more in-depth studies to add more detail to what possible divergences in impact might arise in association with different aphasia types. The present study had insufficient numbers to produce anything more than a general indication. Further, the patients differed linguistically on small number variables, and it would be essential in a future study to compare patients with more widely differing

aphasia profiles. More detailed examination could also explore how far patients with conduction aphasia, who are aware of errors in their speech and very often make attempts to correct it, have a sense of frustration from this during communication. On the other hand, the patients with Broca's aphasia during speech produce short phrases/sentences, consisting of content words, which potentially enable them to communicate relatively successfully with their communication partner, but may lack sufficient depth and detail for the listener.

According to our results, aphasia changes quality of life, regardless of the degree of language impairment. This finding is in line with the results of other researchers who pointed out poor quality of life in people with aphasia [20,26]. It is interesting that the patient with severe Broca's aphasia gave a higher score on the statements related to general quality of life and self-confidence compared to the patient with mild Broca's aphasia. The patient with severe Broca's aphasia had a lower score than the patient with a mild Broca's aphasia only in the statements related to roles and responsibilities. Consequently, our results suggest that severity of language impairment in patients with Broca's aphasia may not have a significant effect on their quality of life - and this would be in keeping with studies that have found no direct match between severity of impairment measures of language with participation and impact measures.

A further point from the results here is that none of the people with aphasia reported a marked impact on their communication related QoL. Future work must explore further why this might be and what factors in a person's social or psychological profile may predispose to or cause greater perceived impact.

In contrast, the severity of language impairment had an effect on quality of communication life in patients with conduction aphasia. Our patient with severe conduction aphasia had lower scores on the statements related to socialization, self-confidence, roles and responsibilities compared to the patient with mild conduction aphasia. In addition, the patient assessed her quality of life in general lower than the patient with mild conduction aphasia. As before, though, the comparison rests on very small patient numbers and therefore much further exploration is required.

Even with these small numbers the complexity of the issues can be appreciated. The patient with severe Broca's aphasia achieved poorer scores than the patient with mild Broca's aphasia only in the domain roles and responsibilities, which is surprising given the more severe aphasia. On the other hand, however, she evaluated herself as good in the Confidence/Self-Concept domain, probably because she is not fully aware of the severity of the language disorder. Besides, being a highly motivated person, she might have scored herself higher. Her score in general quality of life is in line with this assumption. Arguing along these lines one might in later work test out whether the effect of severity of aphasia in patients with conduction aphasia was probably related to the fact that both patients (with severe and mild form of conduction aphasia) were aware of their disorders and limiting capabilities in the communication.

The influence of family factors probably also contributed here. The patient with severe Broca's aphasia has two children and grandchildren. She had maximal support from their children for social activity, communication etc. The patient with mild Broca's aphasia lives with her husband and has no children. She complained that she feels isolated because of her speech difficulties, even though she has returned to her previous work. Our finding is in line with the results from other authors who pointed the correlation between the factors of the environment and quality of life in people with aphasia [24]. However, future work needs to consider in a lot more detailed fashion the accompanying social circumstances of an individual, not just their aphasia scores and QCL rating scores in isolation from other key influences. Any interventions aiming to improve communication related quality of life must also factor in these variables. People's needs and aspirations occur in the context of a wider social and psychological context, and these must be assessed alongside aphasic impairment, but clinicians also need to support people with aphasia in formulating and expressing their own QoL goals.

Conclusion

According to our results, the following conclusions can be drawn: People with Broca's and conduction aphasia express some dissatisfaction regarding their communication related QoL. However, it can be said that their communication life is relatively good, bearing in mind the type and severity of the language impairment.

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