Aphasia, an acquired language disorder

Schoeman R, MBChB, MSocSc, FCPsych, MMed **Van der Merwe G,** BRek, BComptHons
Department of Psychology, Stellenbosch University, South Africa
Correspondence to: Dr Renata Schoeman, e-mail: bibitica@mweb.co.za
Keywords: aphasia; language disorder; approach; Broca; Wernicke

Abstract

Affecting an estimated one in every 272 South Africans, or 0.37% of the population, aphasia is a neurological condition described as "any disturbance in the comprehension or expression of language caused by a brain lesion".

Despite extensive debate throughout the history of neuropsychology there is no universal agreement on the classification of aphasia subtypes. The original localisationist model attempts to classify aphasia in terms of major characteristics, and then to link these to areas of the brain in which the damage has been caused. These initial two categories, namely fluent and non-fluent aphasia, encompass eight different subtypes of aphasia.

Aphasia occurs mostly in those of middle age and older, with males and females being affected equally. As the general practitioner is likely to have first contact with affected patients, it is important to be aware of aphasia and to diagnose and refer patients in an appropriate and expeditious manner.

In this article we will review the types of aphasia, an approach to its diagnosis, aphasia subtypes, rehabilitation and prognosis.

Ⓟ **Peer reviewed. (Submitted: 2009-10-11, Accepted: 2010-01-10).** **SA Fam Pract 2010;52(4):308-311**

Introduction

Aphasia is a neurological condition affecting an estimated one in every 272 South Africans.[1] Aphasia seldom occurs as an isolated symptom, but typically with other symptoms, indicators and risk factors that are suggestive of the underlying cause. As the general practitioner is likely to have first contact with affected patients, it is important to be aware of aphasia and to diagnose and refer patients in an appropriate and expeditious manner.

Described as "any disturbance in the comprehension, or expression, of language caused by a brain lesion",[2] aphasia mostly occurs in those of middle age and older, with males and females being affected equally. However, children can also be affected.[3] Aphasia is caused by any brain injury such as a cerebrovascular accident (stroke), trauma, a brain tumour, a degenerative process such as dementia, or as a sequelae of infections such as meningitis.[3]

Language demonstrates a hemispheric localisation of function, with 90% of individuals having left hemispheric dominance for language,[4] as was first observed by the neurologist Broca (Broca's area) in 1861, and affirmed by Wernicke (Wernicke's area) in 1874.[5] To understand aphasia it is important to acquire an insight into the anatomy of the language areas, including those for comprehension, production of speech, and speech fluency (see Figure 1).

Broca's area (Brodmann areas 44 and 45) is located in the posterior portion of the frontal lobe and is regarded as the syntactic-articulatory pole of the language system, associated with speech production and articulation.[6]

Wernicke's area (Brodmann area 22) is located in the superior posterior temporal lobe and is associated with language processing in both the written and spoken forms.[6] It connects with Broca's area via a neural pathway, the arcuate fasciculus.

The angular gyrus (Brodman area 39) is located at the junction of the temporal, occipital and parietal lobes, and is involved in the processing of auditory and visual input.[7]

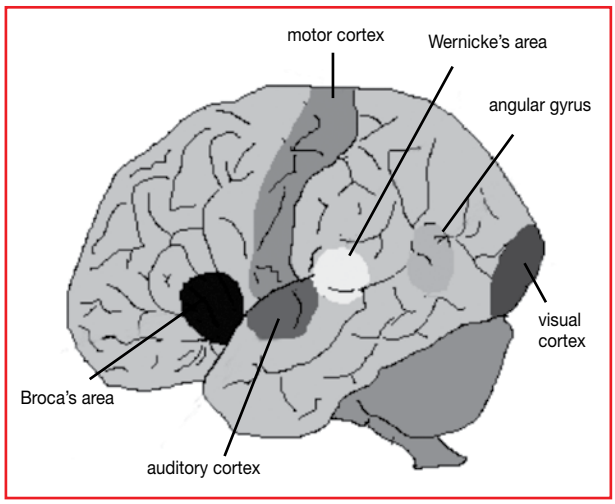

Figure 1: Language areas of the brain

Other areas involved in the comprehension and production of speech are the motor cortex, visual cortex and auditory cortex.

Types of aphasia

There is no universal agreement on the classification of aphasia subtypes, despite extensive debate throughout the history of neuropsychology.[8] One popular school of thought subscribes to the original localisationist model that attempts to classify aphasia by major characteristics, and then link these to the areas of the brain in which the damage has been caused.[9] These initial two categories, namely fluent and non-fluent aphasia, were devised by Wernicke and Broca respectively,[8] and encompass the eight different subtypes of aphasia.

Fluent aphasias, also known as receptive aphasias, are impairments related to the reception of language, with difficulties either in auditory comprehension or in repetition. Speech is easy and fluent, but with difficulties in the output of language, such as the use of incorrect words, or sounds and words in nonsensical combinations (paraphasia). Non-fluent aphasias, also called expressive aphasias, are characterised by effortful and non-fluent speech, but with relatively good auditory comprehension.[8,9]

Assessing aphasia (an approach to diagnosis)

A high index of suspicion of aphasia should be present whenever a patient's difficulty in speech, or speech comprehension, appears to be unrelated to concentration or attention deficits; loss of hearing; physical speech impairment; psychiatric conditions (such as psychosis); or a foreign language background.[10] It is important to assess a patient for the presence of aphasia when he/she presents with complaints of sensory changes, or weakness, in the right half of the body, which is indicative of damage to the left cerebral hemisphere.

Bedside testing, observed and reported behaviour (i.e. behavioural observations, medical records and case history) of the patient should be conducted before any formal, test-based assessment.[11]

Bedside testing allows for the informal appraisal of language and differential diagnoses of aphasia subtype (see Table I), and should probe several different aspects (see Figure 2), such as:

- Expressive, spontaneous, conversational speech and speech fluency. Normal speech should be produced easily, precisely, articulately and typically remain consistent with normal, conversational dialogue, whereas non-fluent speech is effortful, oftentimes distorted, and poorly articulated;
- Repetition of words, phrases, sentences and tongue-twisters;
- Comprehension of spoken language with verbal responses to 'yes/no' questions and response to verbal commands; naming of colours, numbers and letters;
- Reading text aloud and explaining an understanding thereof; and
- Writing words and sentences to dictation and sentences on command.

In assessing aphasia, objects and stimuli familiar to the patient should be employed in order to elicit accurate responses.[10-13]

Management

Once the underlying condition has been treated, and the patient has been stabilised and referred appropriately, the focus shifts to rehabilitation. A patient will occasionally enjoy full recovery from aphasia without rehabilitation, usually following a transient ischaemic attack. In these cases, language abilities may return in a few hours or days. For most patients, however, recovery is not as quick or as complete. Although premorbid proficiency in communication may be re-attained, most patients do not recover completely. In these instances, speech-language therapy is often helpful. The duration of recovery typically spans a two-year period, with few gains thereafter.[8,19,20] Factors influencing recovery include the cause of the brain damage, the area damaged, the extent of the injury, and the patient's age and health.[21]

Given the wide range of variables associated with the condition, rehabilitation should be approached as a process of patient management. Consequently, the process

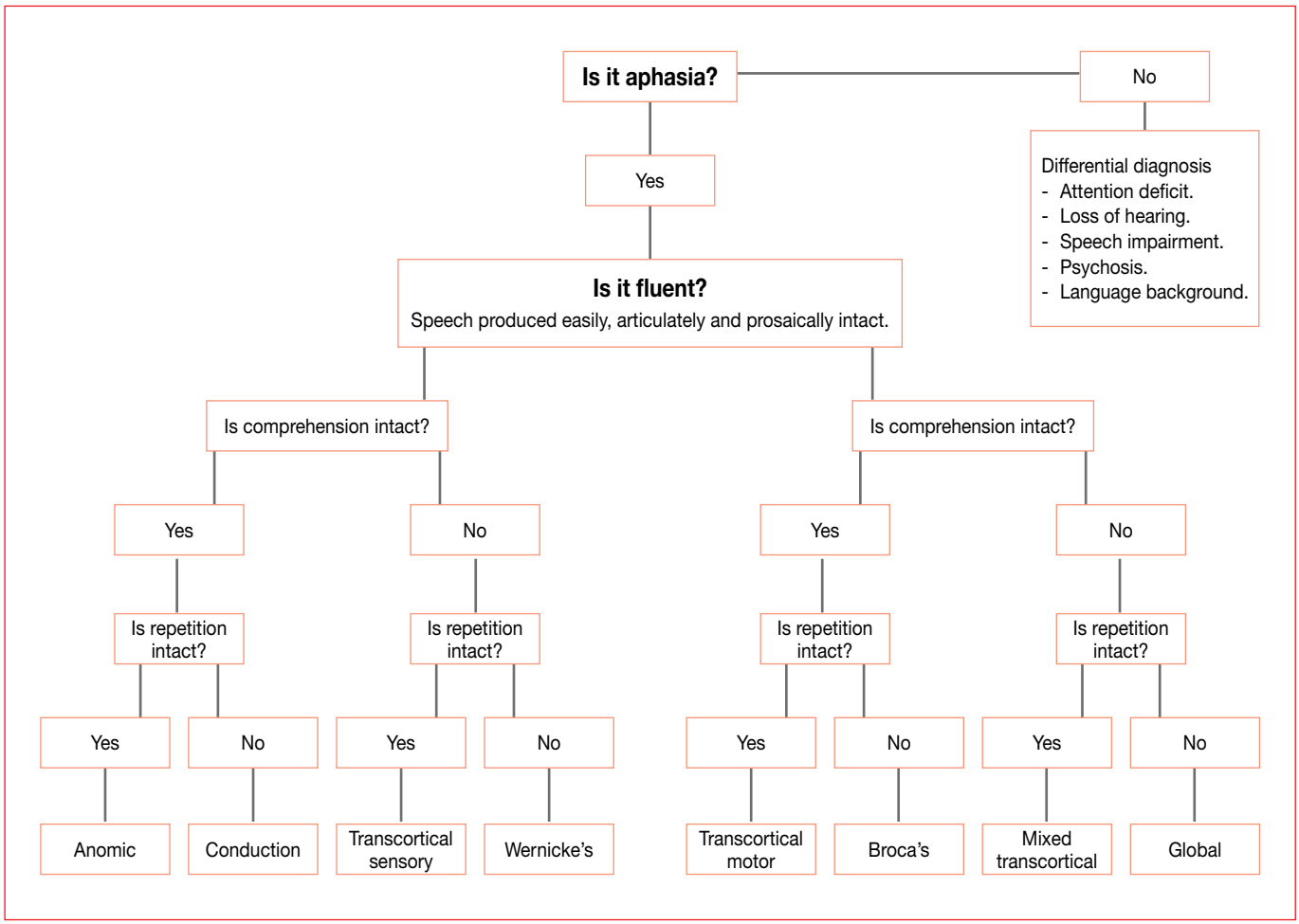

Figure 2: Aphasia flowchart

Table I: Aphasia subtypes in brief

Anomic	Considered the most common of the disorders. Speech output is fluent, well articulated and grammatically correct, yet difficulty in naming objects does have a limited effect on speech output. Language comprehension is intact; and repetition is normal.[8]
Conduction	A comparatively rare form of aphasia. Spontaneous speech production is relatively normal, fluent and correct, although minor phonemic paraphasias may be introduced.[11] Patients struggle to repeat verbatim, and most will fail to repeat anything when function words are requested.[14,15]
Transcortical sensory	Similar to Wernicke's aphasia, the exception being that repetition is intact. Patients have fluent and paraphasic speech and can repeat verbatim, but understand little of what they repeat or read.[12,14]
Wernicke's	Characterised by a severe deficit in auditory comprehension, with fluent, spontaneous, but incoherent, speech being present.[2,16] Patients are usually unaware that their speech is unintelligible.
Transcortical motor	Repetition is intact, but speech is non-fluent, troubled by phonemic and global paraphasias and without connective words. In severe cases a patient's speech is virtually absent. Comprehension is intact and writing is impaired.[12,14,17]
Broca's	Classical non-fluent, and most generally recognised, form of aphasia.[8] It is defined when there is a disturbance in or loss of speech, but with good comprehension of spoken language.[2,14]
Mixed transcortical	The least common of the transcortical aphasias, this form combines both the motor and sensory elements common of the transcortical aphasias. Patients cannot write and have severe speaking and comprehension impairment, but with unaffected repetition.[8,18]
Global	Presents with near complete loss of ability to formulate verbal communication. Speech is non-fluent and reduced to a few words, with impairment of language and auditory comprehension. Right-sided hemiplegia may be present.[14]

becomes one of helping patients and their families to facilitate and restore sufficient, functional communication. In general, patients tend to recover skills in language comprehension more completely than those skills involving expression. Aphasia therapy aims to improve a patient's capacity to communicate by focusing on the use of the remaining language abilities, restoring these language abilities as much as possible; and learning alternative communicative methods. Individual therapy focuses on the specific needs of the person, while group therapy facilitates the opportunity to use new communication skills in a group setting.[19]

Conclusion

Aphasia is a common symptom in patients assessed by the general practitioner (see Table II). The time between onset, diagnosis and the initiation of therapy, and the intensity of therapy all affect the eventual outcome of the degree of recovery. It is therefore imperative to diagnose and refer patients in an appropriate and expeditious manner. The management of a patient should go beyond the aim of improvement of language to include the patient's perception of his or her quality of life, emotional state, sense of well-being, and the presence of adequate familial involvement and support. Depression is the most severe consequence of aphasia, with patients experiencing denial, frustration and anger.[19] The acceptance of a condition such as aphasia is especially complex, and often not achievable.

Table II: Practical considerations

High index of suspicion	'uncooperative' patients difficulty in speech difficulty in comprehension unilateral (right-sided) sensory changes or weakness
Exclude	concentration or attention deficits loss of hearing physical speech impediment psychiatric conditions (such as psychosis) foreign language background
Assessment	general physical examination neurological examination language assessment
Management	manage treatable causes and risk factors early referral to neurologist CT/MRI brain facilitate prompt rehabilitation, including speech and language therapy, physiotherapy and occupational therapy

Acknowledgements

The authors are grateful to Mr Heath Jones, for his assistance with the preparation of the manuscript and the language editing.

References

1. CureResearch.com. Available from http:// www.cureresearch.com/a/aphasia/stats-country.html (Accessed 19/08/2009).
2. Sadock BJ, Sadock VA. Kaplan and Sadock's synopsis of psychiatry: behavioural sciences, clinical psychiatry, 10th ed. Philadelphia: Lippincott Williams & Wilkens; 2007.
3. National Institute on Deafness and Other Communication Disorders. Available from http://www.nidcd.nih.gov/health/voice/aphasia.htm#who (Accessed 19/08/2009).
4. From thought to language. Available from http://thebrain.mcgill.ca (Accessed 16/08/2009).
5. Schoeman R, Louw D. Neuropsychological assessment versus neuro-imaging in the diagnosis of cerebral lesions: an explorative study. Medical Technology SA 2003;17(1):386–93.
6. UCSF Memory and Ageing Centre. Available from http://memory.ucsf.edu/Education/topics/Language.html (Accessed 16/08/2009).
7. Angular gyrus. Available from http://www.wikipedia.org/wiki/Angular gyrus (Accessed 16/08/2009).
8. Beaumont JG. Introduction to neurospychology, 2nd ed. New York: The Guilford Press; 2008.
9. Kolb B, Whishaw IQ. Fundamentals of human neuropsychology, 5th ed. New York; Worth; 2003.
10. Lezak MD, Howieson DB, Loring DW. Neuropsychological assessment, 4th ed. New York: Oxford University Press; 2004.
11. Benson DF, Ardila A. Aphasia: a clinical perspective. New York: Oxford University Press; 1996.
12. Vanderploeg RD. Clinician's guide to neuropsychological assessment, 2nd ed. Mahwah: Lawrence Erlbaum; 2000.
13. Spreen O, Risser AH. Neuroanatomical correlates of the aphasias. New York; Oxford University Press: 1998.
14. Damasio H. Neuroanatomical correlates of the aphasias: acquired aphasia, 2nd ed. San Diego: Academic Press; 19
15. Conduction aphasia. Available from http://en.wikipedia.org/wiki/Conduction_aphasia (Accessed 04/09/2009).
16. Nevid JS, Rathus SA, Greene BA. Abnormal psychology in a changing world, 7th ed. Englewood Cliffs: Prentice Hall; 2008.91
17. Transcortical motor aphasia. Available from http://en.wikipedia.org/wiki/Transcortical_motor_aphasia (Accessed 04/09/2009).
18. Mixed transcortical aphasia. Available from http://en.wikipedia.org/wiki/Mixed_transcortical_aphasia (Accessed 04/09/2009).
19. Sarno JE, Gainotti G. Acquired aphasia, 3rd ed. New York: Academic Press; 1998.
20. Timol RSH. Aphasia and the presence of fluent speech in dreams. Unpublished master's thesis, University of Cape Town, South Africa; 2005.
21. Basso A. Prognostic factors in aphasia. Aphasiology 1992;6(4):337–48.