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Jyoti Shah {ORCID: 0000-0002-2099-7608 }
Sureshwar Lal Karna {ORCID: 0000-0001-6133-8687 }
Himanshu Verma {ORCID: 0000-0002-0306-4961}

CONSTRUCTION OF WESTERN APHASIA BATTERY IN NEPALI: A PILOT STUDY

Jyoti Shah*[1], Sureshwar Lal Karna[2], Himanshu Verma[3]

Ethics committee approval: Its a pilot study at small level and doesn't involved any invasive procedure so didn't need ethical committe approval as such.

Abstract

Present study aims to construct the Western Aphasia Battery in Nepali language. Subjects for this study were 10 Nepali speaking adults in age range of 30 and above, out of which five were healthy and five were aphasics. The cortical quotient (CQ) was not included in the present study as many of our population were illiterate and examining them on the tests of reading and writing was not possible. The current study clearly shows that aphasic patients can be identified and classified into the types of aphasia and also severity of the language deficits can be obtained in terms of the AQ, by using Nepali WAB. The test gives detailed information about oral language abilities which further provides the baseline for therapy plan and recovery.

Keywords: aphasia, western aphasia battery-nepali, aphasia quotient

[1] Dept. of Audiology & Speech-Language Pathology, Ashtavakra Institute of Rehabilitation Sciences & Research, Rohini, Delhi.

[2] Chief of Audiology & Speech-Language Pathology Unit, Tribhuvan University Teaching Hospital, Nepal.

[3] Speech-Language Pathologist & Audiologist, Speech & Hearing Rehabilitation Unit, Dept of Otolaryngology, Post Graduate Institute of Medical Education & Research, Chandigarh.

* Sorumlu Yazar: [1] Dept. of Audiology & Speech-Language Pathology, Ashtavakra Institute of Rehabilitation Sciences & Research, Rohini, Delhi. e-mail: zyots282@gmail.com

1. Introduction

Aphasia is an acquired communication disorder caused by brain damage, characterized by an impairment of language modalities-speaking, reading, listening and writing. It is not the result of a sensory or motor deficit, a general intellectual deficit, confusion, or a psychiatric disorder (Goodglass et. al 1993). Aphasia syndrome can be classified in many ways. Most popular & clinically used classification is the Boston Classification, where aphasia is classified into following types: Broca's aphasia, Wernicke's aphasia, Global aphasia, Conduction aphasia, Anomic aphasia, and Transcortical aphasia.

Assessment is necessary to find out the exact degree, nature, severity & type of aphasia. It also indicates what aspects of language performance are most appropriate for treatment (Byng et al 1990). One of the widely used comprehensive test battery to diagnose degree, severity & type of aphasia is Western Aphasia Battery (WAB) given by Shewan & Kertesz in 1980. WAB designed to evaluate linguistic & non-linguistic both skills. A linguistic skill includes content, fluency, auditory comprehension, repetition, reading, writing, calculation and naming. Non-linguistic skill includes drawing, block design and praxis. The scoring system provides the following overall measure of severity: the Aphasia Quotient (AQ) & Cortical Quotient (CQ). AQ is a measure of language ability whereas CQ predict about the intellectual ability. WAB have eight subtests and the total scoring is out of 100 where data score below 93.8 are said to have aphasia, and score 93.8-97.0 are questionable and score above 97 are consider to be normal. These scores were derived from the 215 aphasics, 63 normal controls and 53 non-aphasic brains damaged patient (Kertesz, 1979).

These above scores were derived from English speaking population. As no language have same structure and syntax so it is not possible to have a common test to assess and classify a disorder for all the languages. So far WAB has been translated and developed in different languages e.g. Korean (Kim & Na, 2004); Cantonese (Yiu, 1992); Tagalog (Ozaeta C. & Kong A., 2012).

India is a multilingual country and has 780 languages including 350 major languages (Linguistic Survey of India, 2013). Till now there are limited number of tests available in Indian Languages. So far WAB has been developed in Telugu (Pallavi, 2010), Kannada (Maria & Shymala, 2010) Malayalam (Jenny, 1992), Bengali (Keshree et. al, 2013). However there is no standardized test available in Nepali till now to assess linguistics and non-linguistic skills for person with aphasia.

Nepali is the eastern pahari language of the Indo-Aryan language family. In some context Nepali is also known as Gorkhali or Parbatiya (Burghart, 1984). According to Appendix 1, chapter V of Census of India, 2011, Nepali language has 38 segmental phonemes which include 6 vowels. Report further stated that word level analysis of Nepali language revealed that a word contain at least one syllable and at the most four syllables.

India is a large country with enormous number of languages being spoken. There are 350 major languages in India. According to Indian constitution, there are several officially recognized languages and Nepali is one of them (Eighth Schedule of Indian Constitution, 1992). About 29,26,168 people speak Nepali language in India. Nepali is spoken mainly in Sikkim, hills of West Bengal, Assam, Darjeeling, Arunachal Pradesh and Himachal Pradesh (Census of India, 2011).

We cannot use a test in one language to assess all the different languages and therefore we need to develop them in all the different languages. Nepali is one among them where there is no standardized test to assess and classify aphasics.

AIM OF THE STUDY:

Present study aims to construct the Western Aphasia Battery in Nepali language (N-WAB) and to check for the construct validity of the test by testing the N-WAB on persons with aphasia.

2. Materials and Methods

It's a pilot study and doesn't involve any invasive procedures.

2.1. Subjects:

A total of 10 Nepali native speakers (age range: 39 to 82 years) participated in the present study. Among 10 subjects 5 were aphasics & 5 were healthy age matched controls. Subjects were selected irrespective of their age, sex, type or severity of the problem. In present study majority of subjects were illiterate or had very low education level as shown in Table 1. Among the 5 aphasics 3 were expressive aphasics tested 2 to 8 months post-onset, one global tested 2 months post-onset and one was a receptive aphasic tested 3 months post-onset. The CT scan or MRI reports, on the site of lesion were obtained during the initial investigation period (i.e. soon after the brain insult) as shown in Table 1. All subjects were selected from one of the hospital from Kathmandu, Nepal. All the aphasic participants were diagnosed by Neurologist and Speech-Language Pathologist on the basis of speech-language characteristics and radiological study.

Table 1. Aphasic Subject Details

S.No	Age	Sex	Educational Level	Site of lesion	Provisional Diagnosis	Period Post-Onset
1	82	M	-	Age related brain atrophy	Broca's	6 months
2	57	M	-	Lt. Parietal hemorrhage extending into ventricle	Global	2 months
3	41	F	10th Grade	Infraction in Lt. temporal parietal lobe	Wernicke's	3 months
4	65	M	7th Grade	CVA (Lt. parietal bleed)	Broca's	8 months
5	39	F	-	Infraction in the left posterior frontal gyrus	Broca's	2 months

Table 2 provides the demographic details of control group. Among 5, two were graduates and one was engineer. All subjects from control group undergone brain study and revealed normal brain study.

Table 2. Demographic Details of Control Group

S.No	Age	Sex	Educational Level	Site of lesion	Provisional Diagnosis	Period Post-Onset
1	48	M	Engineer	No Lesion	Normal	-
2	65	M	10th Grade	No Lesion	Normal	-
3	54	F	3rd Grade	No Lesion	Normal	-
4	36	M	Graduate	No Lesion	Normal	-
5	33	F	Graduate	No Lesion	Normal	-

2.2. Construction of Nepali WAB:

The English version of WAB has two parts. First part of the test examines oral language abilities, which include auditory comprehension and spoken expression. Scoring of this part provides the aphasia quotient (AQ).

Second part of the test examines performance quotient, which includes reading and writing, praxis, calculation and construction. For present study, the second part of the test is not included because many of our population were illiterate and examining them on the tests of reading and writing was not possible. Further tests such as the Raven's color progressive matrix as standardized data are not available for Indian population. So the cortical quotient (CQ), which calculates the combined scores on language and performance subtests, will not be included in the present N-WAB.

The N-WAB was developed similar to the original WAB. In N-WAB each subtest was developed in Nepali. These materials were a translation of the English WAB. These translations were done using Birslin methodology of cross-cultural translation (1970). During adaptation of WAB in Nepali language some items were modified based on the grammatical forms to suit the linguistic profile of Nepali language and the cultural context. The constructed test was rated by 3 speech-language pathologists and 2 linguists on the basis of familiarity and culturally suitable. Less familiar and less culturally suitable words were replaced by more familiar and more culturally suitable words. However, the complexity of the original stimuli was maintained as far as practicable.

The Nepali version of WAB has four major subsections corresponding to the areas that have been most important in identifying aphasia syndrome.

i. Spontaneous Speech
ii. Auditory Verbal Comprehension
iii. Repetition
iv. Naming

Section I- Spontaneous Speech

This section was designed to check fluency and the information content of the spontaneous speech. Patient was asked some general questions and also to describe the picture presented to him/her. Scoring was done for information content and fluency separately. Scores ranged from 0 to 10. Zero for 'no information' and ten for 'correct response' to all questions and picture description. Similarly for fluency zero was for 'non-fluent speech' (i.e. no words or short meaningless utterances) and ten for 'normal fluency'. Total score for spontaneous speech was 20.

Section II- Auditory Verbal Comprehension

This section was designed to check the auditory comprehension and consists of three subsections. Those are Yes/No questions, auditory word recognition and oral commands. In first subsection some questions were asked to the subjects and he/she was instructed to answer as 'Yes' or 'No'. If he/she had difficulty in responding verbally than Yes/No gestures were accepted. Each correct response was given 3 points and maximum score was 60.

In the second subsection, subjects were asked to point out the real or drawn objects. Each correct response was scored '1' and the maximum score was 60. In the third subsection subject was asked to execute the commands and each command was scored according to its complexity. Maximum score for this subsection was 80. All scores of the three subsections were then added up. The total score for this section was 200.

Section III- Repetition

In this section patient was asked to repeat a few words and sentences. Each response was scored on the basis of its complexity as given in the test material. One point was cut for errors in order of word sequence or for each literal paraphasia. Total score for this section was 100.

Section IV- Naming

This section has four subsections- Object Naming, Word Fluency, Sentence Completion, and Responsive Speech.

In the first subsection subject was asked to name the objects presented in front of him/her. Maximum of 20 second was given for each item. Three points was given for each correct response, 2 points for recognizable phonemic paraphasia and 1 point if a phonemic or tactile cue was required. The maximum score in this subsection was 60. In the second subsection subject was asked to name as many animals as he/she can in 1 minute. 1 point for each animal named, even if distorted by literal paraphasia. The maximum score was 20 for this subsection. In the third subsection the patient was asked to complete the incomplete sentences given by the clinician. Two points was scored for correct responses and 1 point was cut for phonemic paraphasia. The maximum score was 10 for this subsection. In the fourth subsection subject was asked some questions and scored 2 points for each acceptable response, 1 point was cut for phonemic paraphasia and the maximum score in this subsection was 10.

2.3. Procedure

The Detailed case history included demographic details and medical history was taken. This included the etiology, onset, radiological reports, neurological reports and other medical reports. The subjects were instructed in their mother tongue (Nepali) before administration of the test. The set of instructions are listed in each section for patient and as well as for examiner. Subject's response for each item administered was recorder in the individual response sheets.

Then scoring was done as given in the score sheet. On

the basis of the scores, the subjects can be differentially diagnosed and classified as Global, Broca's, Wernicke's, Isolation, Transcortical Motor, Transcortical Sensory, Conduction or Anomic aphasia.

2.4. Data Analysis:

Statistical analysis was done using SPSS 20.00 version to find out whether the WAB in Nepali could differentiate aphasics from the normal subjects. The mean, standard deviation and percentile scores were computed using descriptive analysis. To find out the significance level between the groups independent sample t-test was computed for all four subsections of WAB.

3. Results

Nepali version of WAB was administered in all 10 subjects. The WAB scores obtained for both groups were as given in Table 3. The mean and standard deviation were computed for all subsections: fluency, auditory comprehension, repetition and naming.

Table 3. WAB Scores of all Participants

S.No	Information Content	Fluency	Auditory Comprehension	Repetition	Naming	WAB Score AQ	Type of aphasia
1	3	0	5.05	2.8	6.1	33.9	Broca's
2	2	2	3.4	1.0	2.0	20.8	Global
3	5	6	6.1	3.0	8.2	52.6	Wernicke's
4	4	2	5.45	3.2	4.5	38.3	Broca's
5	3	2	6.95	1.0	4.7	35.3	Broca's
6	10	10	10	10	9.5	99	Normal
7	10	10	9.9	9.8	9.3	98	Normal
8	10	10	10	9.8	9.5	98.6	Normal
9	10	10	10	10	9.6	99.2	Normal
10	10	10	10	10	9.8	99.6	Normal

t-test was computed for all four subsections of WAB between the aphasic's subjects and control groups. The result showed significant difference between normal adults and aphasic performance on given tasks as shown in Table 4. Our result support the findings of other studies of adaption of WAB in other languages such as Malayalam (Jenny, 1992), Telugu (Pallavi, 2010), Kannada (Maria & Shymala, 2010), and Bengali (Keshree et. al, 2013).

Table 4. : Demonstrating Mean, S.D. and 't' values for control v/s aphasics performance on test

Subsections of WAB	Subjects	Mean	S.D.	't' value
Fluency	Control	10	0	0.001
	Aphasics	2.4	2.19	
Auditory Comprehension	Control	9.98	0.04	0.001
	Aphasics	5.39	1.13	
Repetition	Control	9.92	0.10	0.00
	Aphasics	2.2	1.10	
Naming	Control	9.54	0.18	0.01
	Aphasics	5.1	2.27	

Aphasic Quotient (AQ) for both the groups was calculated and t-test was computed to measure the significance level between both the groups as given in Table 5.

Table 5: Comparison of AQ score between both the groups

Subjects	Mean	S.D.	't' value
Control	98.88	0.61	0.0002
Aphasics	36.18	12.32	ii

Overall findings reveal that control group has much better AQ than aphasics. Aphasic group showed larger standard deviation as a broad spectrum of aphasic patients were taken irrespective of their type and severity. Similar findings were reported by other studies related to adaption of WAB in other languages Korean (Kim & Na, 2004), Kannada (Maria & Shymala, 2010), and Bengali (Keshree e al, 2013).

4. Conclusion

The current study clearly shows that aphasic patients can be identified and classified into the types of aphasia and also severity of the language deficits can be obtained in terms of the AQ, by using Nepali WAB. The test gives detailed information about oral language abilities which further provides the baseline for therapy plan and recovery.

Limitations of the study:

a. The test doesn't include performance quotient which includes reading and writing, praxis, calculation and construction because we don't have adequate valid norms for test such as the RCPM and large number of our population are illiterate.

b. Standard normative data could not be established due to small sample size.

Future direction:

a. Need to be administered on large group of brain damaged population to get sensitivity and specificity of the test.

b. Performance Quotient need to be included in the test battery.

Patient informed consent : Informed consent was obtained.

Ethics committee approval : It's a pilot study and doesn't involve any invasive procedures.

Conflict of interest : There is no conflicts of interest to declare.

Financial support : No funding was received.

Author contribution area and rate:

Mrs Jyoti Shah: Formulate plan of the study, Data collection, Execution of data on excel sheet and wrote the manuscript

Mr. Sureshwar Lal karna: Data collection and help in data analysis

Mr. Himanshu Verma: wrote the manuscript, collection of review of literature and Data analysis

References:

Brislin, R.W. (1970). Back-translation for cross-cultural research. Journal of Cross- Cultural Psychology, 1, 185-216. doi: 10.1177/135910457000100301.

Byng, S. C., Kay, J., Edmundson, A., & Scott, C. (1990). Aphasia tests reconsidered. Aphasiology, 4(1), 67–91. doi: 10.1080/02687039008249055.

Census of India (2011). Retrived from https://censusindia.gov.in/2011Census/C-16_25062018_NEW.pdf.

Census of India (2011). Chapter V. Retrived from https://www.censusindia.gov.in/2011-documents/lsi/LSI_Sikkim_Part%20-II/Chapter_V.pdf.

Goodglass, H. (1993). Foundations of neuropsychology. Understanding aphasia. Academic Press.

Languages Included in the Eighth Schedule of Indian Constitution (1992). Retrived From https://rajbhasha.gov.in/en/languages-included-eighth-schedule-indian-constitution.

Jenny, E. P. (1992). A Test of Aphasia in Malayalam. Unpublished master's dissertation, University of Mysore, India.

Kertesz, A. (1979). Aphasia and Associated Disorders: Taxonomy, Localization and Recovery. New York: Grune & Stratton Inc.

Keshree, N. K., Kumar, S., Basu, S., Chakrabarty, M., & Kishore, T. (2013). Adaptation of the Western Aphasia Battery in Bangla. Psychology of Language and Communication, 17(2), 189–201. doi: 10.2478/plc-2013-0012.

Kim, H., Na, D. L. (2004). Normative Data on the Korean Version of the Western Aphasia Battery, Journal of Clinical and Experimental Neuropsychology, 26:8, 1011-1020. doi: 10.1080/13803390490515397

Linguistic Survey of India, (2013). Retrieved from http://lsi.gov.in/MTSI_APP/(S(v0mqjfme4h4eqk2av4czqsz2))/default.aspx.

Maria, G. T., Shyamala K. C. (2010). Children acquired aphasia screening test in Kannada (CAAST-K). Student Research at AIISH, Vol. VII, Part – B-Speech – Language Pathology. 88-100.

Ozaeta, C., Kong, A. (2012). Development of the Tagalog Version of the Western Aphasia Battery-Revised: A Preliminary Report. Procedia - Social and Behavioral Sciences, 61,174-176 doi: 10.1016/j.sbspro.2012.10.134.

Pallavi, M. (2010). Development of Western Aphasia Battery in Telugu. Unpublished master dissertation, University of Mysore, India

Shewan & Kertesz (1980). Reliability and Validity Characteristics of the Western Aphasia Battery. Journal of Speech and Hearing Disorders. 45, 309-324. doi: 10.1044/jshd.4503.308.

Yiu, E., M-L. (1992). Linguistic assessment of Chinese-speaking aphasics: Development of a Cantonese aphasia battery. Journal of Neurolinguistics, 7(4), 379–424. doi: 10.1016/0911-6044(92)90025-R.