Development of Indian and Malayalam Version of BDAE-3

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Abstract

The need to assess language capacities in an aphasic should be obvious for a number of reasons. Assessment is essential for the purpose of diagnosis. The BDAE is designed to meet all the three main applications of aphasia assessment, making it maximally useful to the neurologist, speech pathologist and therapist. Beyond traditional aphasia settings, it is among the top five language tests reportedly used by speech-language pathologists who provided services to patients with traumatic head injuries. Although BDAE-3 is very popular in the west, it has not been tested in the Indian context. For international parity such exercises are essential. Although there are considerable number of tests for aphasia available in English and some in the Indian languages (Eg. WAB), there are very few in Malayalam, the language spoken in Kerala. Therefore, the present study attempts to design an aphasia test in Malayalam based on BDAE-3. The study also attempts to make culturally appropriate adaptations in the English version of BDAE-3 so that it can be used for the English speaking Indian patients. The results show that the BDAE-3 (Indian and Malayalam versions) comprehensively assesses the assets and liabilities of an aphasic patient in English and Malayalam by probing into all the aspects of a language. The Indian and Malayalam versions of BDAE-3 may therefore be used as clinical tests for aphasia all over India and in Kerala, respectively.

Introduction

The need to assess language capacities in an aphasic should be obvious for a number of reasons. Assessment is essential for the purpose of diagnosis. Kertesz (1979, cited in Goodglass & Kaplan 1983) states that for a test of aphasia to be considered adequate, it should measure the following which include description of spontaneous speech, a measure of information value, a measure of fluency, auditory comprehension, naming, repetition, reading comprehension, writing, arithmetic and gestural expression (praxis).

The examination of aphasia may be geared to any of the three general aims: 1. Diagnosis of presence and the type of aphasia syndrome, leading to inferences concerning the cerebral localization, 2. Measurement of the level of performance over a wide range, for both initial determination and for detectuion of changes over time and 3. Comprehensive assessment of the assets and liabilities of the patient in all language areas as a guide to therapy.

The BDAE is designed to meet all the three of these applications, making it maximally useful to the neurologist, speech pathologist and therapist. It approaches the aphasia examination as a psychoanalysis and measurement of language-related skills on one hand and on the other hand as a problem in relating particular configurations of symptoms with their neuropathologic correlates.

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The Boston Diagnostic Aphasia Examination has been revised twice: the BDAE-R (Goodglass & Kaplan 1983) and the current version, the BDAE-3 (Goodglass & Kaplan, 2001). The primary focus of the BDAE is the diagnosis of classic anatomically based aphasic syndromes. This diagnostic goal is attained by comprehensive sampling of language components that have previously proven themselves valuable components in the identification of aphasic syndromes.

There is a Short Form of the new BDAE that offers a brief assessment but one that still documents the performances that are essential for diagnostic classification and quantitative assessment. To incorporate the recent progress in neurolinguistic research, a Standard Form of the test with optional excursions into Extended Testing to probe in depth those areas in which the examiner was interested is given. They are (1) the elicitation of more extensive free narrative and scoring of discourse complexity; (2) the examination of category-specific dissociations in lexical production and comprehension; (3) the evaluation of syntax comprehension; and (4) the analysis of reading through the testing of grapho-phoneme conversion, through lexical decision and through the processing of grammatical functors. The goal has been to place in the hands of the clinician an inventory of tests that would be complete and readily accessible and from which he/she could choose at will. Each subtest is as independent as possible of contaminating factors, given that there is virtually no factorially pure test. The user will recognize subtests that owe their presence to the known symptomatology of aphasia. Further, by means of rating scales and error classification, the examiner is directed to those features of language that are not readily reduced to pass-fail scores but that are of critical importance in arriving at a diagnostic decision. These include speech melody, fluency, anomia, syntactic organization and the various forms of paraphasias. The BDAE has always included useful directions for observing and recording many specific types of errors (e.g.: paraphasias) found in aphasia, reflecting an approach that has come to be known as the Boston Process Approach (Kaplan 1988, cited in Goodglass & Kaplan 1983). A number of isolated subtests can be useful additions to clinical assessment depending on the presenting symptoms of the patient, e.g.: the Boston Naming Test.

The Boston Diagnostic Aphasia Examination and Western Aphasia Battery are the instruments chosen if the clinician is interested in the site of lesion. It is recognised as the strength that BDAE has conversational and expository speech sections that rates six features: melodic line, phrase line, articulatory agility, grammatical form, paraphasia and word finding. Supplementary tests are included for use with related disorders. Like BDAE, WAB offers a measure of spontaneous speech; the WAB, however, appears to be comprehensive than the BDAE method. For example, fluency, grammatical competence and the extent of paraphasic errors are combined into a single scale on WAB, whereas they are assessed independently on BDAE. Shewan & Donner (1988, cited in Spreen & Risser 2003) also noted that the WAB spontaneous speech subtest does not provide comprehensive information compared with other tests designed to evaluate this aspect of language. The repetition test in WAB does not appear to be as encompassing or as well structured as other repetition tasks. Beyond traditional aphasia settings, it is among the top five language tests reportedly used by speech-language pathologists who provided services to patients with traumatic head injuries (Frank and Barrineau, 1996).

Although there are considerable number of tests for aphasia available in English and some in the Indian languages (Eg. WAB), there are very few in Malayalam, the language spoken in Kerala. Therefore, the present study attempted to design an aphasia test in Malayalam based on BDAE-3. The study also attempted to make culturally appropriate adaptations in the English version of BDAE-3 so that it can be used for the English speaking Indian patients.

Method

The present study was an attempt to culturally adapt the English version of the Boston Diagnostic Aphasia Examination–3 (Goodglass & Kaplan, 2001) into Indian version and translate it into Malayalam to assess the linguistic proficiency of Indian English and Malayalam speaking aphasic patients respectively.

Test description: The Boston Diagnostic Aphasia Examination was developed by Goodglass & Kaplan (1972). The test consists of six main parts.

I. Conversation and expository speech
II. Auditory comprehension
III. Oral expression
IV. Reading
V. Writing
VI. Praxis

The study consists of the following stages:

Stage I - Modifying original version of BDAE-3 into Indian version: In this stage the English version of BDAE-3 was culturally adapted to be used in the Indian context by making culturally appropriate changes in the test items and pictures.

Stage II - Translation of the test into Malayalam (except BNT, as it is already translated into Malayalam): In this stage, the English version of BDAE-3 was translated into Malayalam incorporating culturally appropriate and language appropriate variations in the test items and pictures. The test was translated into simple language so that it could be easily understood by the patient.

Stage III - Administration of the Indian and Malayalam versions on 20 normal subjects each: This stage included the administration of the Indian version on 20 normal subjects and Malayalam version on 20 normal subjects.

Subject selection criteria

a) Forty clinically non-brain damaged (normal) individuals.

b) Twenty of them should be native speakers of Malayalam and should be able to read and write Malayalam, with 10 years of formal education in Malayalam, on whom the Malayalam version of BDAE-3 is to be administered.

c) The other 20 subjects should speak English and also read and write English, with 10 years of formal education in English, on whom the Indian version of BDAE-3 is to be administered.

Stage IV - Administration of the tests on aphasic patients: This stage included the administration of the adapted English version of BDAE-3 on 8 aphasic patients (3 with Broca's aphasia, 2 with Wernicke's aphasia and 3 with Anomic aphasia) and the Malayalam version on 5 aphasic patients (2 with Broca's aphasia, 1 with Wernicke's aphasia and 2 with Anomic aphasia).

Patient selection criteria

a) The patients should have been diagnosed as having aphasia by a speech pathologist or neurologist.

b) The patients should be native speakers of Malayalam and be able to read and write Malayalam with 10 years of formal education in Malayalam.

c) The patients on whom the Indian version of BDAE-3 is to be administered should be able to speak English and also be able to read and write English with 10 years of formal education in English.

Results and Discussion

The scores obtained by the normal subjects on the Indian and Malayalam version of the tests were tabulated and statistically analysed. Mean and standard deviation were calculated. Results of the t-test indicated that the normals' scores parallel on both versions. This is indicative of the fact that the Malayalam version is adequate or sensitive enough to identify any linguistic deficit present as efficiently as the Indian version.

The scores obtained by the aphasic patients on the Indian and Malayalam versions of the test were profiled on the summary profile of standard and extended subtests. The performance of each type of aphasia on the Indian and Malayalam version is described below.

Broca's Aphasia: The Malayalam and Indian version of the test were administered on 3 Malayalam speaking Broca's aphasic patients and two English speaking Broca's aphasic patients, respectively. The patients showed quite similar performances in their respective test versions. They had nonfluent speech with relatively good comprehension and poor repetition of sentences. In general, the patients obtained relatively good scores on tasks not requiring much of verbal response (auditory comprehension, repetition of simple words, naming, reading of words and praxis). In subtests requiring oral expression (repetition of complex words, sentences, reading paragraphs and writing) they did not score well.

I. **Conversation and expository speech:** The patients could answer the questions asked as a part of the general conversation as they needed to use either only one word or 2-3 word sentences. In Picture description and Narrative discourse they showed nonfluency in their speech and also used short phrases. They used simplified or incomplete grammatical morphemes.

II. **Auditory comprehension:** In these subtests the patients scored near normal levels but they had difficulties in comprehending complex sentences as in commands, Touch A with B and embedded sentences.

III. **Oral expression:** In these subtests the patients performed quite poorly except in word repetition, naming in special categories, naming of animals, action and food. They scored poorly in subtests that needed more oral expression and memory like in sentence repetition, responsive naming, nonsense word repetition, automatized speech, verbal and nonverbal agility. Their melody and rhythm were also rated poor. Literal paraphasias were noticed.

IV. **Reading:** Reading tasks showed better scores for reading simple stimuli like number matching, picture word matching, lexical decision, phonics, free, derivational and bound grammatical morphemes. They showed difficulty in reading complex words as in oral word reading, paralexia prone words, oral sentence reading, comprehension of orally read sentences and reading comprehension.

V. **Writing:** Writing was affected in all the cases. They could write simple primer words and regular phones. But scored poorly in the others.

VI. **Praxis:** All patients could follow the instructions and comprehend the commands. They performed average in these subtests, showing relative preservation of non-verbal movements.

The summary profile of all the patients reveal that they show characteristics that are typical of Broca's aphasia, that is, poor expression and articulation to restricted grammar to the simplest and most overlearned forms, good auditory comprehension and mildly affected reading and poor writing skills.

Wernicke's aphasia: The Malayalam and Indian versions of the test were administered on 2 Malayalam speaking Wernicke's aphasic patients and 1 English speaking Wernicke's aphasic patient respectively. The patients (Malayalam & English speaking) showed similar performances in their respective test versions.

I. **Conversation and expository speech:** The subjects had fluent speech. Paraphasic utterances, neologisms and jargon were noticed. Free discourse, Narrative discourse and Picture description revealed 'augmentation' in one Malayalam speaking patient and the English speaking patient.

II. **Auditory comprehension:** The patients showed poor auditory comprehension skills. They scored below average in all the subtests. They could conprehend simple items in food, tools, animals and body parts but showed poor comprehension of complex sentences like commands, embedded sentences, touch A with B, semantic probe and complex ideational material.

III. **Oral expression:** Paraphasia was seen in the speech of all the patients. Even jargon and neologisms were used. Yet even in jargon, small words of grammar and inflection of paraphasic 'nouns' and 'verbs' were noticed. Repetition showed paraphasic distortions of the stimuli. Paragrammatism was noticed in these patients during recitation. Naming difficulties were also seen in the patients curcumlocutions were seen in one Malayalam and the English speaking patient as their condition was less severe. Neologisms were seen in the other severe cases. Rhythm and melody were near normal levels. Articulatory agility was also near normal levels.

IV. **Reading:** Reading performance also parallels their speech output. It is severely affected especially for paragraphs or sentences.

V. The English speaking patient showed comparatively better scores in matching subtests. And one Malayalam speaking patient showed relatively better scores in lexical decision.

VI. **Writing:** Performance in writing also parallels that of speech output. The patients continued to use their right hand for writing and one Malayalam speaking patient and the English speaking patient showed relatively good handwriting. But the content was unintelligible. There was a disorganized and rambling style in their writing with a dearth of substantives and of concrete action words. Paragrammatism was again noticed in writing.

VII. **Praxis:** The subtests show below average scores because of the patients' inability to comprehend complex commands.

The summary profile of all the patients reveal that they show characteristics that are typical of Wernicke's aphasia, that is, poor auditory comprehension, good articulatory agility, good phrase length and melody, paraphasia in speech, poor reading and writing skills, poor repetition and poor word finding abilities.

Anomic Aphasia: The Malayalam and Indian versions of the test were administered on 3 Malayalam speaking anomic aphasic patients and 2 English speaking anomic aphasic patients respectively. The patients (Malayalam and English speaking) showed similar performances in their respective test versions. The main feature was the word finding difficulty.

I. **Conversation and expository speech:** The patients could answer to the general questions asked. But their speech in free conversation, picture description and narrative discourse showed word finding difficulties. They spoke freely but revealed an emptiness of substantive words. Circumlocutions were seen.

II. **Auditory comprehension:** In these patients auditory comprehension was relatively good. Two Malayalam speaking patients and one English speaking patient sometimes failed to recognize a word offered by the examiner. This blurring of distinction in meaning was seen on objects that have a close semantic relation. Eg. Saying 'mug' for 'cup' by the English speaking patient.

III. **Oral expression:** Naming tasks showed poorer scores. Circumlocutions were seen. Repetition was relatively good. Rhythm and melody was also near normal levels in all the cases. Articulatory agility was either normal or near normal levels.

IV. **Reading:** The patients' matching ability was good. The patients could read simple words but showed difficulty with longer and complex words. One English speaking patient and one Malayalam speaking patient could read the alphabets of the complex words. One Malayalam speaking patient showed alexia. Reading longer sentences also was difficult for the patients.

V. **Writing:** The patients' handwritings were quite legible. But had difficulty with choice of letters. They could write the primer words and regular phones. But had difficulty with the irregular words and non-sense words. One Malayalam speaking case could write the words that he failed to name orally. Narrative writing showed word finding difficulties and circumlocutions.

VI. **Praxis:** In these subtests, the patients showed normal or near normal performance.

The summary profile of all the patients reveal that they exhibit characteristics that are typical of anomic aphasia; that is, word-finding difficulty in the context of fluent, grammatically well-formed speech. There is an absence of literal and verbal paraphasias thus distinguishing it from other fluent aphasias and also auditory comprehension is relatively intact.

An interesting feature was noticed in one English speaking Wernicke's aphasic case that is, interfering of one language with another. When they were asked to point to the items in auditory comprehension, they asked for a translation in Malayalam. They even answered some questions or items in subtests in Malayalam thus showing the interference of native language. The above results presented for the different types of aphasics revealed how each of them performed on the Indian and Malayalam versions of BDAE-3. Variations among the types are evident based on the site of lesion. At a gross level these results conform to those findings obtained by the authors of the original version of BDAE-3 and by that of other tests of aphasia.

On an average, there is not a significant difference in the performance of a particular aphasic type on the Indian and Malayalam versions of the test. But any definitive conclusions cannot be made from the limited number of patients studied presently. Similar research needs to be replicated on a large number of cases to arrive at definitive conclusions.

Inferences that can be drawn from the present study include the following:

1. Differences exist in performance between Indian and Malayalam versions of BDAE-3. Aphasics perform poorly compared to normal performances. Thus, the tests can be utilized adequately to tap out the linguistic deficits seen in aphasics.
2. Differences exist in the performance between the different types of aphasics, thus helping in appropriate classification of the type of aphasia.
3. The scores for each subtest provide us with a guide for therapy. It helps us to know as to which area needs to be strengthened.

The Indian version can thus be used with the English speaking aphasic patients in India and Malayalam version with the Malayalam speaking aphasic patients in Kerala. The Indian and Malayalam versions of BDAE-3 can be used to assess both languages of a bilingual patient. Objective assessment in each language is a pre-requisite to determine which language is best available to the patient for communication. This information will further help in deciding the language for therapy. This sort of an assessment helps to detect symptoms that would otherwise go unnoticed in the other language either because of the nature of the specific features of the linguistic structure of one of the languages or because of differential recovery. Thus systematic assessment of both languages of a bilingual aphasic patient will be of immediate advantage to the clinician.

Thus BDAE-3 tells us to what extent and in what aspects of language is better recovered than another in a patient. It provides a means of objectively evaluating the relative residual abilities in the aphasic patients' language. Thus BDAE-3 (Indian and Malayalam version) helps the speech pathologist to make a thorough detailed investigation of different aspects of language.

Limitations of the study: The tests were not administered on a large population of aphasic patients and only 3 types of aphasic syndromes were considered for test administration.

Implications for further research: This study opens avenues for further research

- Administered on a larger population of aphasic patients for further refinement.
- Different types of aphasia syndromes have to be tested to validate the efficacy of the tests and for standardization.
- The tests can be used for baseline and post therapy assessments of an aphasic client.

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