The Time Factor in Aphasic Evaluation - A Pilot Study on the W.A.B.

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Abstract

General slowing in performance, longer reaction time etc., are often considered as some of the nonspecific symptoms present among the aphasics. Most of the aphasic tests batteries are power tests rather than speed tests. As a result subtle disturbances of timing may be missed. The present study introduces the aspect of timing, to determining whether slowing of performance attributed to normal aging is evident on the Western Aphasia Battery or not and to compare normals with aphasics. Results of this pilot study reveal a significant difference between the normals and aphasics on total time required and a negative correlation was found to exist between severity of aphasia, determined in terms of Aphasia Quotient (A. Q.) and timing aspect.

Introduction

aphasia has been defined as the loss or impairment of language caused by braindamage. Diagnosis and assessment hold a prominent place in historical and contemporary aphasiology. Diagnostics provide the data base for clinicians and researchers.

Testing in aphasia has undergone various forms from simple bedside testing without any special testing equipment to complex test batteries. While the bedside testing does provide the busy clinician with a quick guide to the diagnosis, from which an initial series of management steps may be taken, it lacks standardization and objectivity.

In aphasia research, tests designed to probe the many different levels of language processing have been more refined in the past decades (Stark J.A. 1988).

Most of the clinical tests to date, mainly serve as diagnostic tools. These tests attempt to identify and classify aphasia in terms of severity and/or in terms of clear cut syndromes.

Besides these, there are many clinical and theoretical issues to which standard aphasia tests have contributed significantly and continue to play an important role. Some of these are the study of lesions, behaviour correlations, cerebral dominance, inter and intra hemispheric language organization, cerebral plasticity and recovery patterns.

There is now a growing awareness and trend in the direction of incorporating newer dimensions in the existing test batteries to differentially diagnose aphasia frrom normal aging and other disorders involving language as in dementia (Bayles K.A.,Boone D.R.,Tomoeda C.K., SlausonT.J.and KaszniakA.W. 1989; Harner J., Dawson D.V., Heyman A. and Fish A. M. 1992).

As we progress in aphasiology, these finer distinctions become more important, particularly since literature reveals that thereare both similarities and dissimilarities between these groups (Bowie N.L. and Poon L.W. 1985; Cermak L.S. and Moreines J. 1976; Davis G.A. and Ball H. 1989; Murdoch B.E. 1990).

Aphasia tests are usually insensitive to the minimal impairments of some patients, whereas severely impaired patients cannot perform any item. The question that arises is - How much real communication is involved in pointing to pictures, naming objects or writing words to dictation?

Almost every individual with aphasia has some reduction in the repertoire of words available for speech and requires more time than normal to produce words in response to either pictures or questions. In most mildly impaired aphasias, performance in tasks such as picture naming improves when given extra time i.e., further opportunity for lexical search indicting that the problem is primarily one of slow retrieval. These individuals exhibit difficulty in processing language in day to day communication and fail to reach the standards of rapid processing which normal individuals are capable of (Benson F.D. 1979, Benton A. 1986; Shewan C M. and Cameron H. 1984).

Relying solely on cut off points provided by tests authors in patients with borderline impairment would, in effect be no better than random guessing.

A number of studies have used response latency measurement to differentiate brain damaged group from normals (Crary & Towne 1988).

Among the normals too, certain language changes are reported due to aging and language of normal elderly adults is said to differ subtly from that of young adults, one of the aspects on which the two differ being speed of response (Au R., obler L.K. and Albert M.L. 1991; Bowles N.L and Poon L.W. 1985; Davis G.A. and Ball H. 1989).

This implies that the time factor contributes significantly in the communication process and needs to be incorporated in the test batteries to facilitate better understanding of the problem as well as in determining recovery. Yet measure of speed of clinical test batteries of aphasia. Most of the tests are power tests rather than speed test and thus the patient is given as much time as he feels necessary to complete each task. For example, the Western Aphasia Battery (Kertesz 1979) while being a popular protocol for clinical evaluation of aphasia fails to incorporate element of speed/time in its items with the exception of object naming and work fluency tasks.

Methodology

The aims of this study were as follows :

1. To determine whether slowing of perfornance attributed to normal aging is evident on the Western Aphasia Battery (WAB) or not;
2. To compare normals with aphasics to determine whether the aphasics require extra time;
3. To determine whether severity of aphasics correlated to the timing aspect.

Subject

Normal healthy adults were tested in two groups -

Group I comprised of young adults (20 - 40 years)

Group II comprised of elderly (60 - 80 years)

For determining aphasics performance on WAB, subjects from inpatient Unit of B.Y.L. Nair Hospital, Bombay as well outpatients referred for speech therapy at the All India Institute of Speech and Hearing, Mysore were selected. Among the inpatients, only those subjects whose medical condition had stabilised and could be administered the W.A.B. in one sitting, were selected.

All subjects were diagnosed as having aphasia by a neurologist and tested independently by a speech - language pathologist other than the investigator, prior to this study.

Procedure

Subjects were sated comfortably in a quiet room. The procedure of testing was explained to them and the evaluation was recorded on Philips AM 125 Cassette recorder. Each subitem of the W.A.B. was timed using a stop watch beginning from investigators instruction to end of subjects response.

The Aphasia Quotient and time taken was calculated for each subject.

Analysis of the conversational sample was done to help determine the aphasic syndrome which were confirmed by the W.A.B. scoring system for the oral language tests namely spontaneous speech, auditory verbal comprehension, repetition and naming.

Result

Among normals, statistically (using two way ANOVA) no significant difference was observed between the subje cts or between the two age groups (younger adults and eiderly) with respect to time in completion of the oral lc nguage portion of the W.A.B. as well as in terms of Aphasia Quotient at 0.05 level of significance (Table).

Table I

Normal Subjects

Group 1 (20 - 40 Years)		Group II (60 - 80 Years)	
Time (in secs.)	A. Q.	Time (in secs.)	A. Q.
765	96.1	722	95.0
6t7	97.6	730	94.6
626	95.0	742	97.4
692	97.4	660	96.0
630	98.0	861	95.7
702	96.2	615	97.2
790	97.6	717	95.2
735	99.4	714	96.8
730	96.6	634	98.2
Mean 698.5	97.1	710.5	96.23

In the present study, on task of object naming, the older group (60 to 80 years old) did demonstrate tip of the tongue phenomenon (TOT) and 3 of the 9 subjects had atleast one instance when they needed phonemic cue from the tester. This was not observed among the younger group. This is in agreement with the study by Burke, Worthley and Martin (1988) who examined naming deficits in elderly and found that the elderly subjects experienced significantly more TOTs than younger subjects.

Comparison of normals and aphasics show a significant difference between them with respect to time on the W.A.B. at 0.05 level of significance. This result is in agreement with most studies on aphasia which state that slowness in processing or increased latency of response is a common feature among all aphasics and by the only indication of underlying deficits in milder aphasic forms.

The total time required to carry out each of the 4 oral sub-tests for the aphasic subjects indicate that severity of the aphasic syndrome is linked to time, the Wernicke's who exhibit comprehension deficit clearly took greater time to respond to tasks of auditory comprehension and naming while the less severe aphasic syndromes took relatively lesser time with the anomic group approaching more towards normal range (Table - II, Figure I & II).

Table II: Indicates time taken by the different Aphasics on the various subtests of WAB.

	55/F Broca's	55/M Wernicke's	50/F Wernicke's	55/M T.S.A.	39/M Conduction	25/M Anomic	52/M Anomic	35/M Anomic	38/M R.B.O.
Spontaneous speech	257	445	315	388	184	81	140	114	132
Auditory verbal comprehension	864	950	892	704	650	370	516	485	433
Repetition	194	284	125	146	147	95	113	83	99
Naming	624	993	693	364	954	187	450	316	201
Total Time (in secs.)	1939	2672	2025	1602	1935	733	1219	998	865
A.Q.	47.3	46.3	70.8	73.4	69.1	86.4	80.3	86.6	93.3

Meantime: 1554.22!secs.
Mean A.Q. : 72.61

FIGURE I

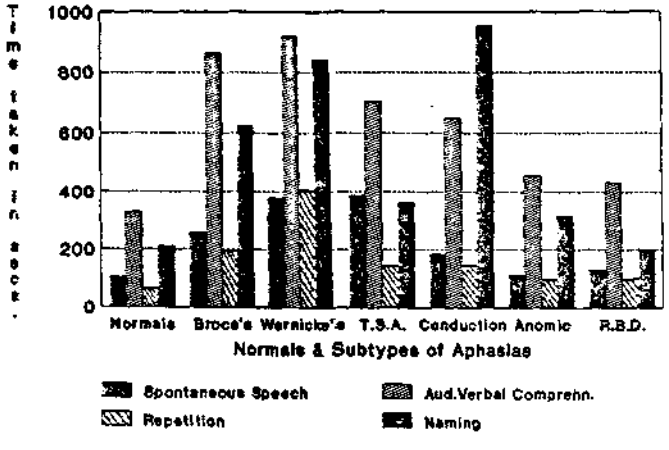
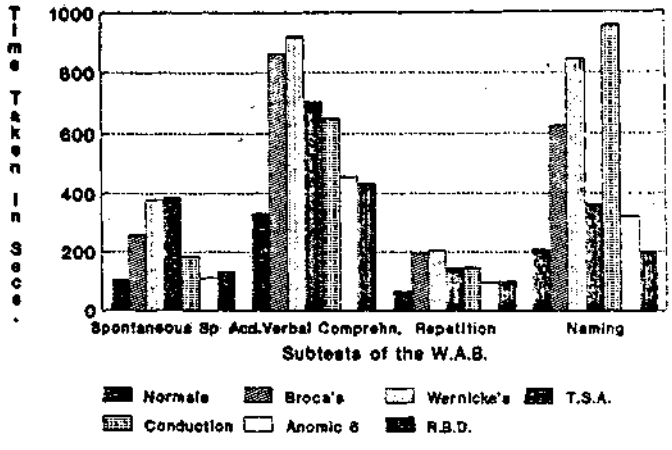


FIGURE II



A high negative correlation (r = -0.74) was found to exist between Aphasia Quotient and overall time taken for completion of the W.A.B.

The relation between A Q and time is however not a linear one. While the nonlinearity is seen in the severe form of aphasia i.e., Broca's and Wernicke's, the relationship between A Q and time is fairly linear in milder forms of language disturbance such as anomia as well as in the right brain damaged subjects, indicating that time needed to respond rather than errors is the major deficit in these patients.

Discussion

The results are in agreement with most studies on aphasia which state that slowness in processing or increased latency of response is a common feature among all aphasics and may be the only indication of underlying deficits in milder aphasic forms.

The lack of any significant difference between the normal young adults and the aged on timing characteristics could be because, the demands on memory are not too high on the W.A.B. and studies have shown that when memory demands are minimized, no age related differences occur (Light, Burke 1988, Hasher and Zacks 1988). Intergroup comparison among the aphasics in the present study gives meaningful insight of how incorporation of time factor along with other measures like Aphasia Quotient (A.Q) help us in the understanding of severity of the problem.

If A.Q. was the sole criteria of severity measure then it would suffice to rank order them according to their scores to predict their communication difficulties. In this study we find that this criteria does not always hold true. For example comparison between Broca's and Wernicke's subject No.2 reveals a higher A.Q. (70.8) of the Wernicke's in comparison with Broca's subject (47.3). But consideration of timing shows that the Wernicke's subject takes longer time (20.25 secs) than the Broca's (19.39) to complete the test which means that in day to day communication, the Wernicke's subject might fail to carry out rapid processing and thereby hamper communication. This implies that his problem is nearly equal if not more than the Broca's subject despite having a higher A.Q. This factor strengthens the need to incorporate time aspect in our test batteries. It may also be possible to identify subtle deficits in communication in the mild aphasis by incorporating time aspect in the test battery. Frequently one may come across cases who fallowing spontaneous recovery or with therapy do score above the cut off value between aphasia and normals on the W.A.B. and therefore would be considered as normal clinically. It would however be inaccurate to consider them normal as they may continue to report some sort of communication difficulties encountered in the rapid processing required in every day situations. This feature while being missed out by just noting the A.Q. will be of great value if their response latencies are times and compared with normals.

Determining the nature of deficit with respect to processing time will also help in working on the therapy goals where clinicians can gradually build up patient's ability at rapid processing in terms of both reception and expression.

Critical look at each sub-test in terms of accuracy and promptness of response can help determine where the major problem lies. This has implications for both counselling and rehabilitation strategies.

Although the present study has been carried out on a small sample, clear cut information may be obtained in future using larger samples and different subgroups, to determine whether timing aspect can be made a part and parcel of existing test batteries and give further weightage in determining severity as well as in differentially diagnosing the brain damaged aphasics from normals; brain damaged non aphasics and dementias.

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