The Evolution of Initial Global Aphasia: Implications for Prognosis

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Although detailed literature on the evolution of aphasic syndromes is sparse (Gloning and Quatember, 1964; Kertesz and McCabe, 1977; Kohlmeyer, 1976; Mohr, 1973), the subject is of considerable interest to clinical aphasiologists for several reasons. First, as patterns change, clinical management methods necessarily must be modified. Second, families and patients both require counseling about ways in which a particular aphasia might or might not evolve. Finally, together with the pertinent medical features and premorbid patient characteristics, the evolution of aphasic syndromes potentially provides the key to making prognoses about the extent of recovery.

Global aphasia is particularly problemmatic in this regard, especially if it is diagnosed soon after stroke. Initially it is the least stable pattern; it has potential for evolving into any other type of aphasia or it can remain unremitting. And, unlike other syndromes, no pattern evolves to it without additional brain damage.

METHOD

This study is a longitudinal examination of the course of language recovery in patients who were globally aphasic immediately after stroke. All consecutive cases who presented with global aphasia upon admission to either of two University hospitals in the Pittsburgh area and who survived beyond their discharge were studied. Eleven females and four males, who ranged in age from 35-84 years of age (mean = 64.1 years) and who averaged twelfth grade education were studied. Fourteen patients had thromboembolic strokes and in all 14 cases the lesion was confined to the left hemisphere. Site of lesion (as determined by CT scan within 48 hours of admission) varied within the sample.

Each patient was observed daily throughout the course of hospitalization. Observations consisted of 15-minute tape-recorded conversations between the patient and two speech pathologists. Following each observation, observers jointly classified patients' language disturbances using a set of definitions derived from the literature on aphasia (Albert, et al., 1981; Benson, 1974; Goodglass and Kaplan, 1972; Kent and Rosenbek, 1978; Kertesz and Poole, 1974; Wertz, 1978). Observers also completed an observational summary report to capture additional patient characteristics, such as use of communicative strategies, intactness of auditory comprehension, etc. for which the observers were required to provide examples. At time of hospital discharge, all patients were tested using the Western Aphasia Battery (WAB) (Kertesz, 1982). Patients were retested at 6-8 weeks, 10-12 weeks, 6 months and 1 year post-stroke if they continued to score below the WAB's normal Aphasia Quotient cutoff (93.8). Following each testing, patients' language impairments were classified according to the WAB and also according to clinical impression. The two classifications were not always equivalent. Descrepancies between clinician and WAB classification for a large sample of patients (of whom the present form a subset) were discussed in detail by Swindell, Holland, and Fromm (1984).

The hospital language samples for the 15 patients were transcribed and coded by one of three speech pathologists who were trained to reliably

transcribe and code the language samples. Patients' first, mid, and last observation transcripts were then analyzed using Systematic Analysis of Language Transcripts (SALT), a computerized program developed by Miller and Chapman (1984) and modified for use in aphasia by Holland, et al., (1985). SALT provides for the measurement of a number of standard features such as total number of utterances, MLU (in words and morphemes), number of different words and different word roots, conversational turns, and so forth. The aphasia modification is a coding system that provides for the isolation of a number of additional features. These features include Conversational Successes (Queries, Answers to Questions with 1 or More than 1 Word, Gestural Answers to Questions, Introduction of New Topics, Comments on Topics, Social Lubricants, Social Openings or Closings); Conversational Failures (Echoic Responses, responses containing Erroneous Information, Inappropriate Topic Shifts, Bizarre, Unintelligible, or Incoherent responses, Confabulation); Extralinguistic Features (Revisions, Verbal Intrusions, Laughs, Gestures); and Linguistic Errors (Failed Word Search, Phonemic Paraphasias, Semantic Paraphasias, Jargon/Neologisms, Agrammatisms, Perseverations).

RESULTS

Within the year following stroke, five patients had died. Death was a more likely outcome for older patients; all patients who died were 60 years of age or older. Four of the five were living in nursing homes at the time of death.

Surviving patients demonstrated a number of distinct patterns of language recovery, with age associated with type of aphasia at one year post-stroke. This finding is presented in Figure 1. Two patients, both females in their 30's, recovered normal language function; one of these recovered by 2 months post-onset and the other by 6 months post-onset. Two patients, both males in their 40's, evolved to Broca's aphasia by hospital discharge, although one had a second stroke at 9 months post-onset which again rendered him globally aphasic. Two patients, one 59-year-old female and one 61-year-old male, evolved through a number of aphasia types to reach a WAB classification of anomic aphasia at one year post-onset. Clinical judgment was that the language impairment of both patients was unclassifiable. Two females, both in their 70's, evolved to a WAB classification of Wernicke's aphasia, although clinical impression suggested multi-infarct dementia for both. The two remaining patients, females in their 80's, remained globally aphasic. These observations suggest that age may be a pertinent feature in language recovery and evolution. Demographic characteristics including education, employment status, and marital/family status also appeared to have no influence on recovery.

Knowing the outcome at one year post-stroke, we examined the hospital SALT data for patients whose language evolved and for patients who remained globally aphasic. All five patients who died were globally aphasic at time of their last testing. However, because any possible evolution of their aphasia was cut short by death, they will not be included in the following discussion of patients who remained globally aphasic.

Patients remaining globally aphasic demonstrated minimal change over the course of their hospitalizations. This was evident on all of the standard measures. For example the number of complete utterances (which includes gesture) stayed about 1 per observation), MLU stayed at 0. Successful utterances consisted of a few inconsistent gestural responses. A patient might offer a hand when asked to "give me your hand" or open her eyes in response

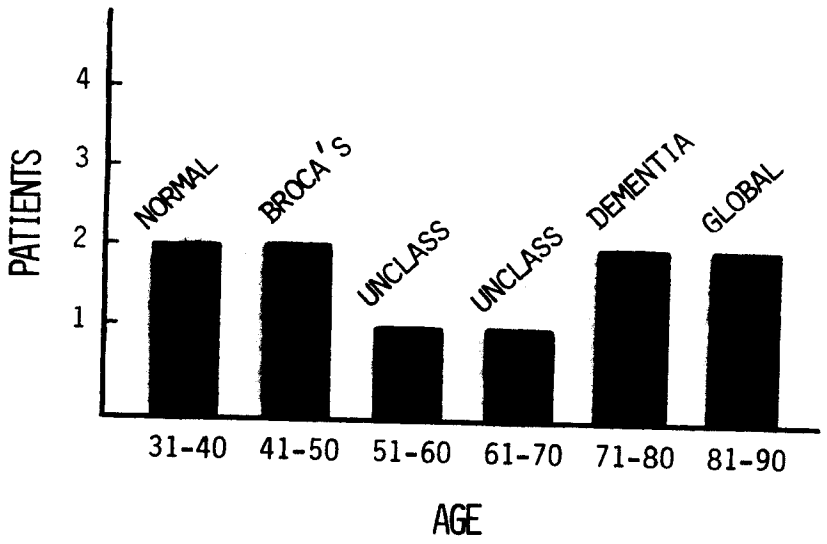

Figure 1. Age and type of aphasia for the ten patients at one year post stroke.

to her name. Communication failures produced by this group of patients were consistent across the observations with No Responses and Unintelligible Responses predominating. Further, unintelligible responses had a simplistic phonologic structure and more closely resembled vegetative vocalizations than any type of meaningful communication. These patients were never active conversational participants and seldom made eye contact. Turn-taking and extralinguistic features were not apparent.

For the ten patients whose aphasia evolved to other types some early evidence for change was also apparent during the course of the year. Rapid improvement in MLU, number of different word roots, and number of complete utterances were favorable prognostic signs for early resolution of aphasia.

Figure 2 shows the number of complete utterances over the three observations for the two patients whose language returned to normal. As the number of complete utterances increased, so did the number and types of successful utterances. For example, simple one-word responses to questions were replaced by longer and more elaborate responses to questions. Comments on topics and requests for information also began to appear, as did extralinguistic features such as laughs, revisions, and verbal intrusions. Patients became more actively involved in the conversation, as evidenced by their turn-taking and increased number of social lubricants.

With regard to unsuccessful utterances, a decline in the number of No Responses and Unintelligible Responses was an encouraging characteristic. This was felt to reflect improvement in patients' auditory comprehension. Interestingly, an increase in the number and types of aphasic errors was also a favorable sign. As patients increased their communication attempts, they had more instances of failed word search and a greater variety of semantic and phonemic errors.

Initial patterns also characterized evolution to specific types of aphasia. Patients who evolved to Broca's aphasia also demonstrated an increase in number of complete utterances. This increase, however, reflected patients' increased use of gestural communication as opposed to verbal output. As can

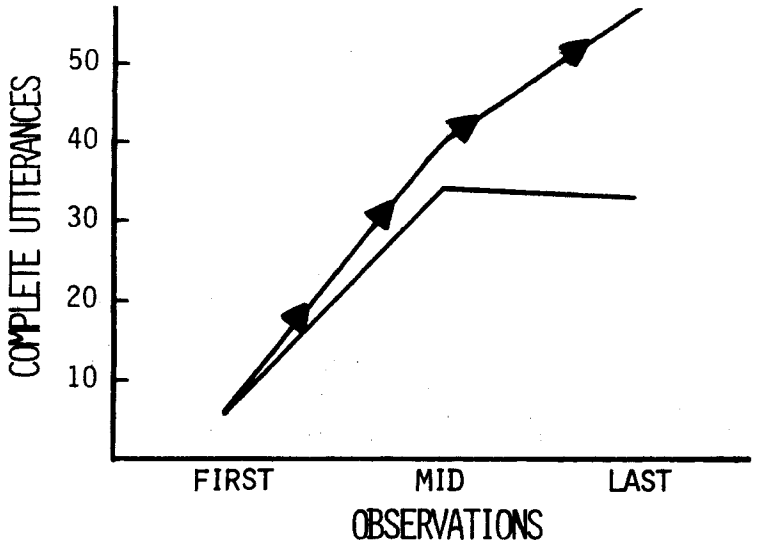

Figure 2. Number of complete utterances across the three observations for the two patients whose language returned to normal.

be seen in Figure 3, the number of different word roots used across the three observations remained low, especially for the one patient who had an apraxic component to his Broca's Aphasia. In addition, the number of different word roots closely matched the total number of different words, indicating that these patients were not expanding their verbal output through the use of bound morphemes. Further, their vocabulary remained almost exactly the same over the three observations. For example, one patient's output during the first observation consisted of the numbers 1-10 and the words "oh, boy, yeah, no, hmm, right, hi, and yep." This changed very little over the course of his hospitalization.

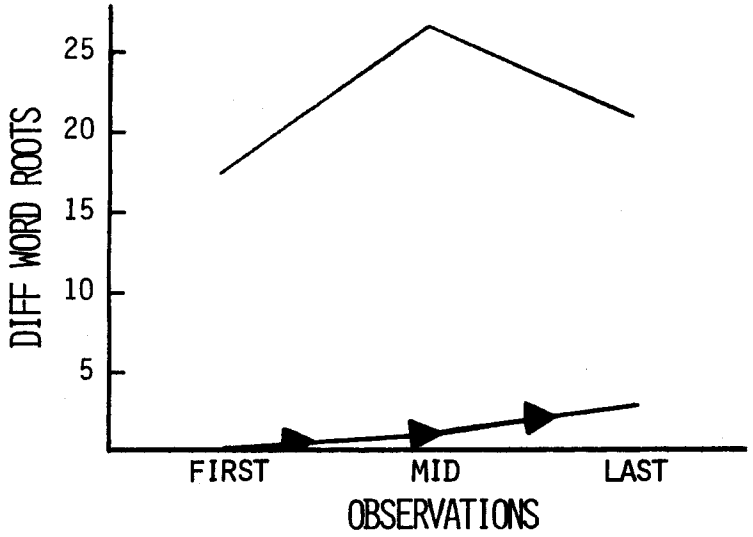

Figure 3. Number of different word roots across the three observations for the two patients whose language evolved to Broca's aphasia.

Figure 4 presents the change in MLU for the two patients whose WAB classification at one year post-stroke was anomic aphasia and whose language was unclassifiable by clinical impression. Both patients showed an increase in response length by their mid observation. Many of these responses, however, were incoherent, erroneous or confabulatory. For example, one patient who worked for a dairy company was asked his occupation. He responded, "Well, my work is figuring out the ins and the outs." Asked what the ins and outs were, the patient responded, "of the erl. The ins and outs of the sixties." The other patient showed a sharp decline in MLU by her last observation. Observational summary reports documented an increasing depression in this patient, which reflected the paucity of her communication attempts and her low MLU.

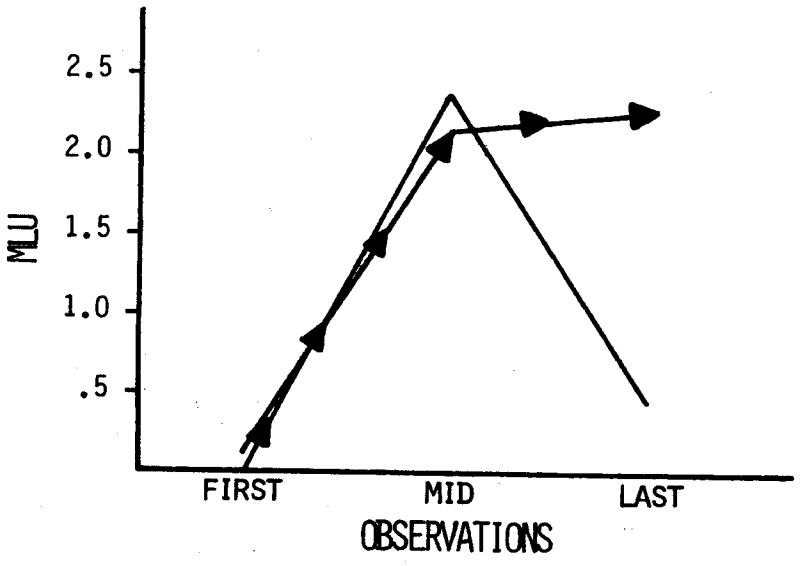

Figure 4. Mean Length of utterance (MLU) across the three observations for the two patients whose language impairment was unclassifiable at one year post stroke.

Some early differentiating signs were evident for the two patients whose clinical impression at 1 year post-stroke suggested multi-infarct dementia. While their verbal output improved over the course of their hospitalizations, their auditory comprehension did not. And, over the course of the year, auditory comprehension abilities and other cognitive abilities declined, which we felt confirmed our impression of a dementing condition overlying a language disturbance.

SUMMARY

Within the year following stroke, one-third of a sample of patients who were globally aphasic upon hospital admission had died. Death was a more likely outcome for older patients than younger patients and four out of five of these patients were living in nursing homes at the time of death.

Age appeared to influence recovery; the younger the patient the more favorable the prognosis. Age also appeared to relate to the type of aphasia at one year post-stroke. Both of these relationships have been reported

previously (Harasymiw, Halper, and Sutherland, 1981; Holland, 1985; Kertesz and McCabe, 1977; Obler, Albert, Goodglass, and Benson, 1978).

With regard to the hospital observations, lack of change on all of SALT's standard measures and especially the large number of No Responses and Unintelligible Responses was discouraging and associated with a persisting Global Aphasia.

In contrast, rapid changes in the number of complete utterances, MLU, the number of different word roots, and the number and variety of successful utterances were all associated with more rapid and complete recovery. Improved auditory comprehension of language, as indicated by an increase in turn-taking, number of social lubricants, and presence of extralinguistic features was also a favorable sign.

Although these results are preliminary, they suggest that early language characteristics may very well relate to outcome of global aphasia. Furthermore, results support the value of early hospital observations and subsequent analysis of language transcripts as a means of furthering our understanding of recovery from aphasia.

ACKNOWLEDGMENT

This work was supported by Grant #NS 17459-03 from the National Institutes of Health.

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DISCUSSION

Q: Do you have any test-retest reliability on these patients? I am wondering whether the data couldn't be accounted for by the normal variability that one expects from aphasic patients rather than by evolution.

A: Because our samples were daily conversational interactions, and not tests, I assume you mean how representative of each days' language was the sample we analyzed. We cannot, of course be sure that it was representative. However, we chose the interval length based on previous careful work for validation of CADL in which successive 15-minute samples of four hours of conversation with aphasic people were analyzed for consistency and for emergence of features that were not apparent in preceding samples. That analysis, done on normal daily activities of chronic patients suggested that consistency was achieved in a 30-minute segment. Because of the restricted environment of the hospital and the factor of illness, we chose the 15-minute sample as having high likelihood of being representative.

Q: In the acute phase, many aphasic patients can't talk for a number of reasons. Have you considered the possibility that we also become globally aphasic rather than we begin with global aphasia?

A: It is an alternative that we have not considered, primarily because in our experience with 95 acute aphasic patients, the only ones who became global after starting with other problems did so because of subsequent cerebral events (some occurring in the hospital). Such patients were, by definition, excluded here. It was the case that some initially comatose patients came out of coma and into global aphasia. They also were not considered here. Finally, we do not deny the possibility that additional complicating factors, such as confusion, coexisted with aphasia in this study. In fact we specifically discussed these factors.

Q: What do you tell the families of these patients?

A: If conversations with the patient yield a high number of no responses and unintelligible responses throughout the course of their hospitalizations, I would suggest a poor prognosis for language recovery. On the other hand, if patients become more active conversational participants during their hospitalizations and increase their communication attempts, I would suggest a more favorable prognosis for language recovery.