Medical Hypotheses (2006) **67**, 713–716

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medical hypotheses

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Situational therapy for Wernicke's aphasia

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Received 3 October 2005; accepted 6 October 2005

Summary Patients with Wernicke's or expressive aphasia are able to produce fluent speech, however, this speech may be complete gibberish sounds and totally incomprehensible, or even when comprehensible to a degree is often laced with severe errors and abnormalities such as verbal and phonemic paraphasias and neologisms. Furthermore, patient's with Wernicke's aphasia have poor to no understanding of speech or language. There is no proven method for rehabilitation of Wernicke's aphasia, or even much guidance for physicians or speech therapists to treat Wernicke's aphasia patients. In contrast to their poor to non-existent communication skills using speech or other forms of language, it has long been appreciated informally and formally that Wernicke's aphasia patients are able to communicate well, even normally, using non-verbal means such as actions, movements, props, gestures, facials expressions, and affect. Furthermore, in non-language domains Wernicke's aphasia patients can show normal memory and learning abilities. Thus, we here suggest that the non-language communication channels of Wernicke's aphasia patients be channeled and utilized in their functional rehabilitation: Specifically, we suggest that therapy for Wernicke's aphasia patients should consist of placing patients in real or simulated important functional situations – e.g., buying food, taking transport – and let the patients train and learn to use and hone their non-language communication means and skills for improved practical functioning.

Aphasia – acquired difficulty with language – is a not uncommon and often extremely severe sequel of stroke or other brain lesion [1]. There are a number of different forms of aphasia: In 1861 Paul Broca [2] was the first to give a definitive description of a type of aphasia – now known eponymously (or as expressive aphasia) – complete with anatomical localization. (There is an extensive prehistory of sophisticated and accurate descriptions of expressive and other forms of aphasia [3] dating back [4] at least as far as the Biblical Book of

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0306-9877/$ - see front matter
doi:10.1016/j.mehy.2005.10.035

Psalms (137: p. 5–6).) In Broca's aphasia left frontal cortical lesions cause the patient to have difficulty expressing thoughts using verbal or written language (including sign language [5]), while understanding of language is largely intact. In 1874 Carl Wernicke [6] described a different kind of aphasia due to damage of the left posterior temporal cortex. In this remarkable description, Wernicke cataloged the cardinal signs of a form of aphasia now also known eponymously, or as receptive aphasia: (1) patients have poor to no understanding of language in any modality – spoken or written. (2) Patients have no trouble producing speech but it is often completely lacking in meaning and includes all sorts of errors such as verbal paraphasias (e.g., ''knife'' for ''fork''), phonemic paraphasias (''bife'' for ''knife'') or neologisms (new words, such as ''bort'' for ''fork''). (3) Curiously, these patients are oblivious and unperturbed by their problems, and often seem not to notice that others cannot understand their speech. It is important to note another feature of Wernicke's aphasia – no doubt long recognized informally by physicians, speech therapists, other medical personnel, and patients' families and friends, as well as formally [7] – which we think may be able to be harnessed to achieve functional rehabilitation in these patients: Wernicke's patients' ability to communicate their thoughts, needs and wishes is significantly better, sometimes approaching normal, using non-verbal means such as actions, movements, props, gestures, facials expressions, and affect, than verbally. For example, when standing in a cafeteria line with choices of fish or pasta, a Wernicke's patient will shake his head ''no'', when the cafeteria staff tries to put fish on his tray – though not answer coherently with words when asked if he wanted the fish – and then point to the pasta. Similarly, we have seen Wernicke's patients upon egress from a clinic appointment, walk correctly to the elevator, press correctly the up or down button, get out of the way of people exiting, the elevator, exchange normal non-verbal pleasantries with other elevator users, and press the button correctly for the floor to which they want to go. When another person waiting for the elevator would try to speak with the patient, there was no effective, or even coherent conversation. We here suggest that standard speech therapy per se not be used for Wernicke's patients, but instead place Wernicke's patients in real or simulated situations important to them and have them work on using non-verbal means to successfully communicate.

There are other kinds of aphasias besides Broca's and Wernicke's, e.g., conduction aphasia in which patients have relatively preserved understanding and speech but grossly impaired ability to repeat phrases. But most clinical problems in aphasia derive from difficulty with expression (pure Broca's aphasia), understanding (pure Wernicke's aphasia) or some combination of expressive and receptive language difficulties, for example severe globally aphasic patients who have grave difficulties in both expression and understanding of language. Thus, improved methods to treat Wernicke's aphasia should benefit not only patients with pure receptive language difficulties, but also those whose clinical syndrome includes a significant component of receptive deficits.

Unfortunately, rehabilitation of aphasia continues to be a significant challenge. Expressive (Broca's) aphasic patients would seem to be the easiest to rehabilitate as these patients can understand the method used in a given rehabilitation technique, or at least the directions to utilize the technique. However, there has been scant success in rehabilitation trials in expressive aphasia. A large trial 20 years ago, which has not been superseded, highlights the problem: nearly 200 patients who lived to be discharged after a stroke with expressive aphasia were randomized to receive speech therapy with whatever method the speech therapist felt was best twice a week or no therapy whatsoever [8]. There was some improvement in both groups, but the therapy produced no significant benefit over no treatment. In another sort of approach, two trials using the stimulant bromocriptine, a dopamine agonist, failed to produce positive results [9,10]. For Wernicke's aphasia, upon checking the literature (e.g., Medline) or books aimed mainly at physicians or researchers [1,11,12], or speech therapy practitioners [13], there are no proven rehabilitation methods for receptive aphasia, and very little guidance for the speech therapist.

Unlike treatment methods for aphasia, methods to assess the degree and specific type of deficit in a given patient's aphasia have been well-validated [1]. But after assessment, what should come next for a patient found to have typical Wernicke's aphasia or a strong component of expressive aphasia in their assessment? Often we see a basis for therapy taken from the observation that a given patient may have more preserved receptive language when reading than when listening to spoken speech, or vice versa. But we have not seen this to be of practical utility. And, theoretically, we would not expect it to be particularly useful because, while there may be some differential ability of understanding written vs. spoken language, this difference is usually not large enough to be clini-

cally significant. Similarly, while there may be a slight difference in the overall language level in understanding, this difference often does not manifest as the ability to recognize specific words reliably from session to session, or in successive real world encounters. Drilling on specific words or phrases, a common approach in therapy of Broca's aphasia, is not and should not be useful in Wernicke's aphasia patients, as receptive aphasia patients cannot understand the directions of the drills, and even when a gain is made, it is not maintained.

In stark contrast, we have found Wernicke's aphasia patients' non-spoken/written language communication to be robust, practically useful and amenable to training: for example, nurses know that Wernicke's aphasia patients are able to indicate by gesticulation and facial expression if they are given another patient's medication, or reliably present their arm for a blood pressure check. Such abilities of Wernicke's aphasia patients are not merely ''overlearned'': Patients typically know when it is time for medications to be taken by mouth, or to pull up their shirt for a subcutanenous injection of heparin — a medication not taken at home. The presence of these abilities may indicate that the patient's system of concepts is largely intact, but he or she has merely lost the verbal tags and grammatical structure to communicate his or her thoughts with. Furthermore, learning in Wernicke's aphasia patients is not only procedural as in patients with severe hippocampal lesions and anterograde amnesia. For example, even in crowded hospital hallway Wernicke's aphasia patients have often stopped us, smiling broadly with a look of recognition and offered their hand to shake as a greeting, while making comments such as ''the san, the san ['man']'', or ''she ['he']''. Thus, Wernicke's aphasia patients are able not only to learn to recognize individuals they did not know before becoming aphasic, but can use their all in skills to communicate a warm greeting, even with extremely poor spoken language ability. These all in communication abilities which Wernicke's aphasia patients are thus spontaneously effectively deploying need to be nurtured and harnessed. Wernicke's aphasia patients are also able to understand and communicate subtle concepts: When playing chess or checkers with Wernicke's aphasia patients, if the examiner makes an illegal (''cheating'') move, the patients invariably give a look of disbelief or anger to the examiner or waive their hands in objection, though they do not possess sufficient language to complain verbally.

Some of the following approaches might be helpful: aphasia patients need a home visit to determine what real life problems are important for that patient to work on, much as patients with hemiplegia or simply geriatric patients with deficits from ''normal'' aging in vision, sensation and movement do to make sure the house is safe. Or one can give Wernicke's patients a clock or calendar to have them demonstrate when they need to be places. If a Wernicke's aphasia patient needs to buy various items at a store, have the therapist go with him or her to the store, or simulate the store and let the patient use all in communication means, not just spoken language to communicate. Also, while their words are poor and not consistent from day to day, their thoughts are largely clear and consistent, and patients if trained in a situation may be able to learn to muster some words like ''sasta'' for ''pasta''. or ''setti'' [''spaghetti''], rather than trying to work on a single word, which will not be repeatable.

A proposed method of therapy

We suggest the following method for therapy of patients with Wernicke's aphasia: (1) make a thorough assessment of the patient's language ability. (2) Until a particular method to improve speech or language itself in Wernicke's aphasia is proven in a good quality trial, no time during the speech therapy session should be spent specifically on language therapy. (3) A home visit should be made by a speech therapist and/or a social worker to determine the patient's need for things at home, work and leisure activities. (4) Therapy sessions should be focused on using non-verbal means to work on those areas: e.g., if a patient needs to be able to shop go to a store with the patient and assist them and train them. As interactions with the therapist involve language, patients get exposure to this ''for free''.

Testing the method

Assemble a large group Wernicke's patients and have one set of testers assess their language skills. Have another set of investigators do a home visit to assess which areas or skills the Wernicke's aphasia patients need work on. Then randomize the patients to standard speech therapy to use traditional spoken and written language based therapy sessions to improve patients in their needed domains (control group), or to a group using the same number and length of sessions as in the control group but in which patients are placed in situations important to them and trained and encouraged to

use any communication means possible, e.g., pointing to a picture of a food item on a menu to order, using a clock or calendar to make or set appointments, facial expressions, residual words, etc. to achieve their goal (intervention group). At the end of the therapy sessions assess the patients' ability to perform their needed task, and compare the control and intervention group.

We believe that the training procedure and spirit we have put forth may be of greater overall benefit to patients than current methods, and we hope our hypothesis stimulates more interest in developing and testing methods for rehabilitation of Wernicke's and other forms of aphasia.

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