

Treatment of Auditory Comprehension on Aphasia

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Abstract

Aphasia is a systemic disturbance of speech, revealing in the complete loss or partial loss of speech and local lesion caused by one or more of the speech areas in the brain. In most cases, aphasia occurs in adults, however, it is also possible in children, if the brain injury occurred after it had been formed, at least partially. The term 'aphasia' is derived from the Greek 'fasio' (say) and the prefix 'a' ('no') and literally means 'I do not speak'. Since aphasia does not always mean complete absence of speech, it should be called dysphasia. However, there is a concept of the 'taken term' in the science. Regardless of similar terminology conventions, the concept of aphasia has been fully defined by now. It comes to the recognition of: systematic speech disorder, which implies the presence of the primary defect and discharge of secondary speech disorders, covering all levels of language (phonology, vocabulary and grammar); compulsory process violation of both external and internal speech. This condition is stipulated by the specifics of the speech function: a) its division into internal and external speech; b) systemacy, i.e. dependence of some parts from the other as in any system.

Classification of Aphasia Forms

The most common and recognized neuropsychological classification in foreign aphasiology was introduced by Luria. It replaced the classical neurological classification of the aphasia forms, at the origins of which stood Broca's and Wernicke. The concept of aphasia by Luria bears the idea that the lesion is always located at the level of secondary fields of the left hemisphere cortex. It leads to a particular kind of speech apraxia or agnosia, which have a systemic effect on the pathological work of the tertiary cortical fields. As a result, the patient has difficulty using the language needed to convey the meaning of the message. Thus, according to A. R. Luria, the tertiary (semantic) fields in the cortex remain unaffected at aphasia, but cannot fully function, having lost gnostic or praxis bases.

Depending on the injured prerequisite, and therefore, the lesion location a form of aphasia

is determined. Classification of the aphasia forms by A. R. Luria (6 forms): 1. Motor afferent aphasia type. 2. Motor efferent aphasia type. 3. Dynamic aphasia. 4. Sensor (acoustic-gnostic) aphasia. 5. Acoustic-mnemonic aphasia. 6. Semantic aphasia.

Amnesic and conduction aphasia observed in practice and diagnosed by clinicians in this classification are not included. One takes interest in regarding closer the symptoms of the sensor (acoustic-gnostic) aphasia, since the auditory comprehension is most disturbed and defective in this particular phase (Hough, 2014). The sensor (acoustic-gnostic) aphasia occurs at lesions of the upper-temple areas, the so-called Wernicke's area, first discovered it as responsible for the understanding of speech and denoted aphasia arising during its lesion as the sensor one. The primary defect in sensory aphasia is impaired ability, which is considered to be directly dependent on the phonetic hearing condition. It consists in differentiation of meaning-perceptive features of speech sounds taken in this particular language. Phonemic hearing disorders cause, according to the neuropsychological concept of aphasia, gross violations of impressive speech, i.e. the understanding. There arises the phenomenon of 'alienation of word meaning', which is characterized by 'exfoliation' of the sound shell of the word and its object reference. Speech sounds lose their constant and consistent sound to the patient and every time is perceived distorted, mixed together on various parameters. As a result of this sound lability the expressive speech of patients gain characteristic defects: logorrhea (abundance of speech production) as a result of 'the pursuit of an elusive noise', the replacement of some other words, some sounds with the other: verbal and literal paraphasias (Dickey, M. W. Yoo, 2014).

At rough degree of sensory aphasia the volume of speech understanding is extremely limited. Patients are only able to comprehend purely situational speech close to them by the topic. The gross alienation of the word meaning is revealed when showing body parts and objects. Verbal instructions are not followed or are performed with gross distortions. The basis of these phenomena is made by the primary gross violation of phonemic hearing. When perceiving the speech patients

rely on hard facial expressions, gestures, interlocutor's intonations. Written speech suffers primarily because of the collapse of the associative link between the phoneme and grapheme. Most roughly it acts against opposition phonemes. Patients try to find the letter resting on the words having it the most reinforced (for example, 'm... m... m... – mother'; m...m...m ... milk', etc.), however, this path often leads the desired result (Boo & Rose, 2010).

At the less rough degree of sensory aphasia patients understand overall the situational speech, however, the perception of more complex non-situational kinds of speech is difficult. There are errors in understanding the words, the paragnosia, and also alienation of the word meaning on the names of individual objects and body parts. Sometimes patients are able to differentiate words with oppositional phoneme, but make mistakes in the corresponding syllables. There is no revealed pronounced dissociation between the possibility of understanding the words abstract and concrete values, although the denotation suffers more than the figurative sense. The rate of speech of the interlocutor and prosodic features has significant influence on the ability to understand speech. In the task to evaluate the correctness of speech constructions patients usually distinguish grammatically correct structures from the distorted ones, but do not notice them in semantic inconsistencies. They are able to only notice a rough sense of distortion and have difficulty perceiving deployed texts. Understanding of texts sets a definite problem requiring committing a series of sequential logic operations. Sometimes it occurs in difficult conditions of auditory attention depletion. Verbal instructions are often misspelled. Written speech is characterized by the same features as the oral, though expressed more vividly.

Acoustic-amnesic aphasia. This form of aphasia is caused by lesion located in the middle and posterior parts of the temporal area. Unlike acoustic-gnostic aphasia, acoustic defect is not manifested in phonemic analysis, but in the listening mnestic activity. Patients lose their ability to retain in memory the information perceived by hearing, showing thereby the narrowing of the verbal memory scope and the presence of weak acoustic tracks.

Restorative Training to Improve Listening in Patients with Aphasia

The rehabilitative training should be preceded by careful survey of patient's speech. The survey, conducted by a physician, neuropsychologist or speech therapist should identify the nature and depth of various aspects of speech disorders. Its mission is also detecting the storage elements of speech and other cortical functions. Examination should, if possible, cover all aspects of speech, and the state of praxis, gnosis, invoices, etc. Based on the survey taking into account the data on clinical examination there administered the general conclusion determining the form of the speech disorder and recovery stage of speech functions.

Patients with aphasia go through individual and collective speech therapy classes.

Individual form of work should be considered as the principal, as it is this form that provides the fullest account of the patient's characteristics, the closest personal contact with him/her, as well as a great opportunity for psychotherapeutic influence. In the course of training at the hospital and clinic patients need constant medical supervision. Speech therapist (or teacher, class leader) must be in constant contact with the patients' doctor and the first to signal changes in the patients' condition during training (gain of speech disorders, increase in distractibility, etc.). In the period of studies conduction with aphasia patients the frequency and duration of these studies, intervals, changing forms of work are determined by the patients' condition and the degree of their individual exhaustion. They are also associated with a variety of rehabilitative training tasks at different stages of the dynamics of speech after the stroke. The duration of each session at an early stage after the stroke is on average 10-15 minutes, preferably 2 times a day. Average time for individual lessons and residual later stages should be considered 30-45 minutes, preferably daily, but at least three times a week. For group lessons (no more than three to five per group) the classes last 45-60 minutes.

At the beginning of the work with the patients and later in the process of restoring their speech functions, periodically based on the speech status of the patient, one needs to determine the

objectives and methods of rehabilitative training for a prospective patient with aphasia. They should be recorded onto a special speech therapy map individually for each patient. The speech therapist should also record changes in the condition of patients at least twice a month in the speech medical history. When organizing group activities it is advisable to recruit groups with similar forms of speech disorders and relatively uniform reduction step. It is desirable to conduct evening classes with patients at the hospital. They must acquire a form of the home assignment performance by patients. Their main task is fixing the mastered ways to overcome those or other defects of speech activity in the classroom with a speech therapist. Evening work with patients with aphasia may also include activities beyond the limits of a mere deepening of the main program of rehabilitative training. It refers to the group lessons, combining patients with different forms of aphasia and including the available items of 'club' activities: conversations on topics of current events, showing slides of the 'cinema travels/trips', TV series discussion. The so-called speech games are also useful, games like bingo, guessing, etc (Morris & Franklin, 2012).

Specific examples should be used to explain necessity of careful, patient and at the same time respectful attitude to the patient and desirability of its active part in the family life. The choice of the technology of speech rehabilitation depends on the period and the recovery phase of the speech function. Tasks of the rehabilitation stage defined by the individual plan, rehabilitation program are consistent with the nature and extent of the speech perception violations. In the acute and early recovery periods the rehabilitation work is carried out at a relatively passive participation of the patient in the process of reconstructing an audio speech perception. At later stages of recovery a patient is required to actively participate in rehabilitation. In the acute period of speech therapy sessions are to establish contact with the patient, in the neuropsychological examination, aimed at revealing the patient's speech and intellectual capacity, lies the residual capacity of higher mental functions, the study of emotional and volitional spheres. During this period, speech therapy sessions should bear predominantly psychotherapeutic nature. At first classes are recommended to

conduct whispering. Speech therapists use modern educational technologies in their work, apply methods of audio-visual stimulation, taking into account the multicultural region. By the end of the third week after the stroke in most cases the basic form of aphasia emerges and the early recovery period (up to 6 months) begins, when the work is carried out with a specific form of aphasia (Murray & Keeton, 2006).

The early stage of recovery methods include:

- Stimulating listening comprehension (in various forms of aphasia);
- Disinhibition of the expressive aspects of speech at afferent and efferent motor aphasia (automated speech series, proverbs, songs, phrases with rigid context, speech tasks of incentive character, speech patterns needed for everyday communication, reading poems and short phrases);
- Methods of agrammatism prevention (telegraphic style) - stimulating comprehension and using verbal lexicon in the responses;
- Methods of promoting the global reading and writing.

In the later, residual phases of logotherapy compensation mechanism is more widely used; speech function is not restored to its previous form, but changes its structure. Emotional factor is crucial at all stages of speech rehabilitation. Patients are constantly in need of encouraging conversations to form positive motivation towards activities and the right attitude towards themselves. Recovery of speech requires more time than the general condition of the patient improved. During the first two years after the stroke or traumatic brain injury it is desirable that the patient is regularly engaged in hospital rehabilitation activities (1-2 months) and in the clinic. Every 2-3 months of training one should make a short break (1-2 months). The total duration of speech therapy sessions makes 2-3 years (Helm-Estabrooks, 2012).

According to the observations and statistics patients with speech disorders accounted for about 44.7% of the total number of patients in the observation period from 2008 to 2011. Despite the change in the number of such patients (89 patients in 2008, 422 in 2009, 624 and 735 patients

in 2010 and 2011 respectively), the ratios of patients according to the forms of speech disorders are relatively stable. The most common speech disorder is dysarthria, the symptom complex of which includes violation swallowing. According to our surveys, dysarthria is observed in 61.42% of patients with speech disorders. The most common violations are minimal dysarthric disorders (30.67%), mixed forms of dysarthria are observed in 26.45% of patients. Less common 'pure' are bulbar and pseudobulbar dysarthria forms (9.96% and 6.96%, respectively). Dysarthria develops in 13.4% of cases and is more common in conjunction with swallowing disorders. According to different authors, neurogenic dysphagia in acute period is revealed in 25 to 65% of patients of the number received for in-patient treatment (Francis & Clark, 2010).

Comprehension Stimulation and Recovery of Speech in Acoustic-Mnemonic Aphasia

The main task of rehabilitative training in patients with this form of aphasia is to strengthen the verbal memory, which includes the expansion of the framework of auditory perception. This is achieved through such methods work as: display of objects (real and pictures) by the names, showed in pairs, triples, etc.; showing parts of the body on the same principle; implementation of 2-3-link oral instructions; answers to detailed questions that gradually become more complex by syntactic structure; listening to texts consisting of a few sentences and answers to questions on the content of the texts; writing to dictation of gradually built phrases; reading of gradually built phrases and then reproducing them by the patients (from memory) of each of the sentences and the entire set as a whole.

Increasing the steadiness of hearing and speech traces should be performed using such types of training as: repeating from memory the read letters, words, phrases, gradually increasing the time interval between reading and reproducing, as well as filling pauses with any other activity; memorizing short poems and prose texts; rerun of objects and art images after 5-10 and then 1 minute after the first presentation; reading texts with the 'lag' in time retelling (10 min, 30 min, etc.); oral sentence building with supporting words that are visually perceptible; spell words with

gradually increasing complexity of sound structure and a gradual withdrawal from the written sample of these words.

In addition to these specific acoustic-mnemonic aphasia problems other tasks are set, such as overcoming the difficulties of naming. It means: the analysis of visual images and independent drawing objects denoted by the word-names; semantic play of different types of words in contexts denoting objects, actions, and various attributes of objects; classification of words with independent selection of generalizing word; exercise of explaining words with concrete, abstract and figurative meaning (Salis, 2012).

Systemically conditioned pathological symptoms in patients with this form of aphasia include difficulty organizing of the expanded expression. In this regard, activity is required to address them. A separate problem is organizing the expanded expression. To solve it, one applies: making up stories on a series of scene pictures; retelling texts: first by the detailed plan, then according to the closer one, and finally without a plan; detailed dialogues on outer situational topics (professional, social, etc.); training samples of communicative and narrative writing (greeting cards, letters, presentation, essay on a given topic, etc.).

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