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SOCIO-COMMUNICATIVE POTENTIAL OF PATIENTS WITH SPEECH DISORDERS DUE TO ORGANIC BRAIN LESIONS OF VARIOUS ORIGINS

Abstract. The article deals with the problem of socio-communicative potential of patients with speech disorders due to organic lesions of the central nervous system of various origins. It considers differentiation of strategies of correction and predicting the effectiveness of speech therapy in the rehabilitation of patients with various speech disorders based on their potential socio-communicative abilities. The authors analyze the organizational and substantive aspects of improvement of correction and rehabilitation care, including speech therapy services to patients with stuttering and other speech difficulties caused by consequences of stroke, traumatic brain injury, neuroinfections, etc.

Key words: neurorehabilitation, speech disorders, stuttering, aphasia, focal brain injury, rehabilitation potential, differential strategy of correction, social and communicative capability.

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Over many years, the issues of investigation of the communicative function of man have been in the focus of attention of the leading

scholars and specialists in the field of psychology (G. M. Andreeva, A. A. Bodalev, L. S. Vygotskiy, V. N. Kunitsyna, V. A. Labunskaya, A. N.

Leont'ev, M. I. Lisina, B. F. Lomov, A. K. Markova, V. N. Myasishchev, B. D. Parygin, L. A. Petrovskaya, S. L. Rubinshteyn, etc.), psycholinguistics (I. N. Gorelov, N. I. Zhinkin, I. A. Zimnyaya, A. A. Zalevskaya, V. A. Kovshikov, A. A. Leont'ev, A. D. Slobin, T. N. Ushakova, A. M. Shakhnarovich) and neuro-psychology and logopedics (A. G. Arushanova, T. V. Akhutina, L. Z. Arutyunyan, E. S. Beyn, L. I. Belyakova, N. A. Vlasova, T. G. Vizel', L. N. Galiguzova, A. N. Kornev, R. E. Levina, A. R. Luriya, G. D. Netkachev, V. V. Ooppel', V. K. Orfinskaya, N. M. Pylaeva, V. I. Seliverstov, T. A. Fotekova, M. E. Khvattsev, L. S. Tsvetkova, V. M. Shklovskiy, M. K. Shokhor-Trotskaya, etc.) not by chance, as communication has a considerable impact on the whole process of psychological development of man, which is the basis and the means of formation of his or her special relationships. Most specialists note that the person's social disadaptation and poor effectiveness of the system of his social functioning are the most important consequences of speech function disorders.

Persons with speech disorders of various geneses demonstrate malformation of the social-communicative behavior, which determines the urgency and practical significance of the problem under consideration.

In the framework of our research, we look at the socio-communicative potential of patients with speech disorders as a significant integrated parameter determining the purpose, tasks, content-organizational and methodological aspects of neuro-rehabilitation and the main criteria of evaluation of effectiveness of rehabilitation intervention.

Working out the scientific-methodological foundation of the concept "socio-communicative potential of patients with speech disorders" we referred to the theoretical positions presented in the Russian conception of communication by B. G. Anan'ev, G. M. Andreeva, A. N. Leont'ev, M. I. Lisina, L. A. Petrovskaya, S. L. Rubinshteyn, etc. This approach fully takes into account the social orientation of communicative activity. Thus, for example, M. I. Lisina considers communication as a process of people's interaction aimed to unite and match the efforts with the purpose of establishing relationships and achieving a common result (M. I. Lisina, 1985).

Considering the notions of "communication", "communicative activity" and "social communication" as synonyms, the authors brought their semantic, regulatory and demand-motivational components (preservation of emotional-personal and volitional regulatory preconditions of communication,

social-communicative intention, content, leading form of communication, regulation and control of realization of the program of socio-communicative interaction) to the forefront. Another important constituent of socio-communicative activity is its operational component determining the effectiveness of using certain (verbal and non-verbal) means, correspondence of the strategies of interaction to the social and moral-ethical norms, and preservation of cognitive pre-conditions of socio-communicative interaction.

The comparative study of the socio-communicative potential of patients with various forms of speech disorders (stuttering and aphasia) was carried out during the period from 2007 to 2013 on the base of the Center of Speech Pathology and Neuro-rehabilitation of the Moscow City Department of Health Protection where unique opportunities for conducting a most complex patho-genetically grounded process of complex multi-professional intervention based on the combination of high-tech medical aid with a complex of neuro-rehabilitation procedures including, apart from purely medical, medico-psychological, medico-pedagogical and medico-social intervention have been created. This process is targeted, first of all, at the personal-communicative

potential of the patient and at restoration of his social activity.

The sample included two groups of patients with different forms of speech impairment (aphasia and stuttering).

The first group consisted of 120 patients aged 18-75 undergoing treatment at in-patient departments #2 and #3 of the Center of Speech Pathology and Neuro-rehabilitation of the Moscow City Department of Health Protection with speech disorders caused by organic lesions of the brain. All patients of this group had logopedic diagnoses “Complex motor aphasia of predominantly efferent type” and “Complex motor aphasia of predominantly afferent type”.

The second group included 120 patients aged 18-75 undergoing treatment at the logoneurosis ward of the Center of Speech Pathology and Neuro-rehabilitation of the Moscow City Department of Health Protection. The patients of this group had logopedic diagnoses “Severe logoneurosis (stuttering) of tonal-clonic type; of breathing-voice-articulation form”, “Moderate logoneurosis (stuttering) of tonal-clonic type; of breathing-voice-articulation form”, “Mild logoneurosis (stuttering) of tonal-clonic type; of breathing-voice-articulation form”.

Our research was carried out in the framework of the modern concep-

tion of neuro-rehabilitation (E. S. Beyn, T. G. Vizeľ, E. N. Vinarskaya, O. A. Krotkova, A. R. Luriya, L. I. Moskovichyute, V. L. Naydin, L. G. Popova, V. Ya. Repin, E. G. Simer-nitskaya, E. D. Khomskaya, V. M. Shklovskiy, M. K. Shokhor-Trotskaya, etc.) which formed during the period from 1959 to 1987 on the base of the Scientific Research Institute of Neurology of the Russian Academy of Medical Sciences. Later, in 1987-1992 the scientific guidance of the process of elaboration, approbation and implementation of innovative technologies of rehabilitation of patients with aftereffects of organic lesions of the brain took place on the base of the Center of Speech Pathology and Neuro-rehabilitation. At present, the Center of Speech Pathology and Neuro-rehabilitation is the central link in the uniform system of neuro-rehabilitation of patients with speech disorders caused by organic lesions of the brain in Moscow (Figure 1)

As a result of joint activity,

the scientific-methodological and organization center and the Department of speech pathology and neuro-rehabilitation of the Moscow Scientific Research Institute of Psychiatry of the Ministry of Health and Social Development of Russia, the Center of Speech Pathology and Neuro-rehabilitation of the Moscow City Department of Health Protection and city practical healthcare institutions worked out guidelines for the neuro-rehabilitation service, adopted standards and technological maps of neuro-rehabilitation of patients with speech disorders at different stages of impairment. The unique technologies of diagnostics and rehabilitation of higher psychological functions (HPF) disorders in persons of various ages with after-effects of lesions of the central nervous system (CNS) which were approbated and implemented in the practical activity of the neuro-rehabilitation service are especially valuable.

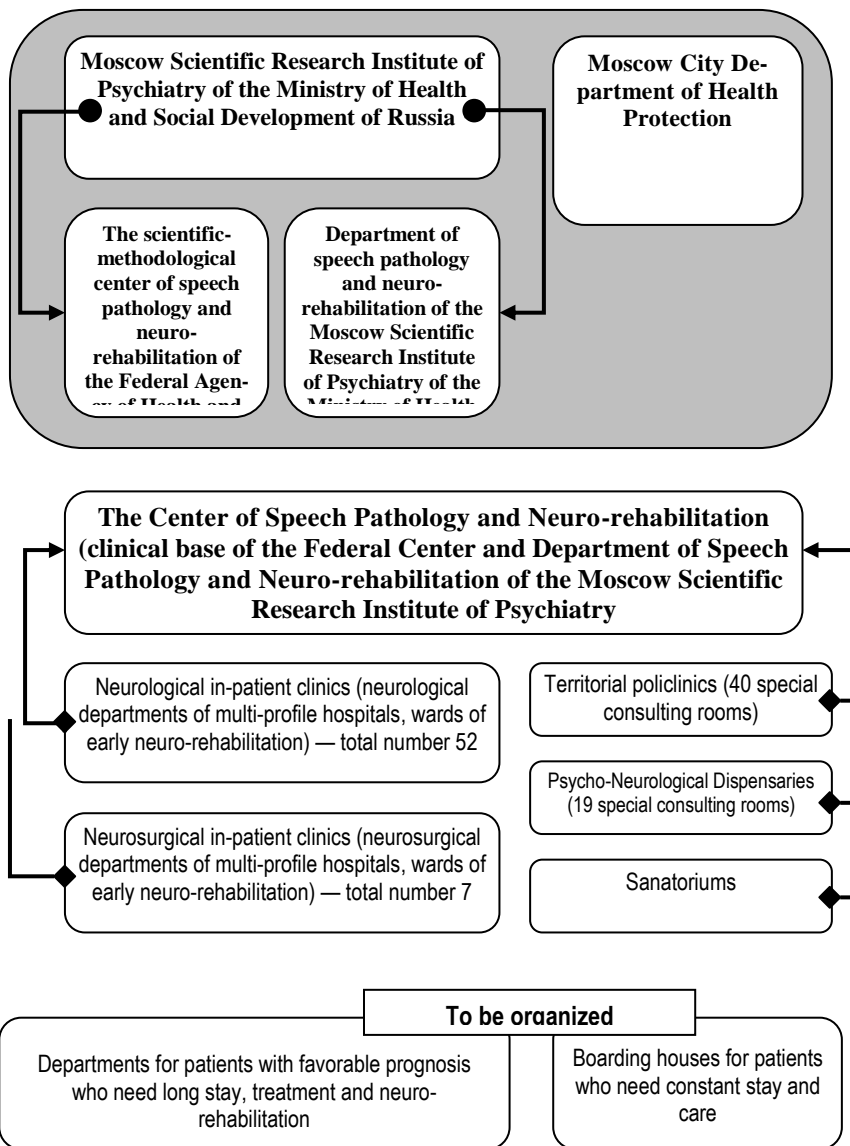


Figure 1. The structure of the neuro-rehabilitation service of Moscow

Logopedic rehabilitation which is treated in the light of expansion of the existing and creation of new speech abilities, optimization of the communicative activity and formation of the socio-communicative potential enhancing the opportunities of the individual to take an active part in social interaction is an important constituent part of complex rehabilitation of persons with various speech disabilities.

Logopedic rehabilitation is a complex process primarily aimed at rehabilitation and compensation for disorders of speech activity. The process of logopedic rehabilitation presupposes the development of sensory functions; motor skills, especially articulatory ones; development of cognitive activity, and, first of all, thinking, memory, and attention; formation of personality with simultaneous regulation of social relations; impact upon social environment.

Modern technologies and programs of logopedic rehabilitation of persons with various forms of speech pathology are designed on the basis of consideration of the correlation between safe and impaired components of the speech functional system and the cognitive preconditions for its realization. The study of the structure of impaired function and potential capabilities of the patient constitutes a signifi-

cant stage and part of any rehabilitation process (E. S. Beyn, T. G. Vizel', L. S. Vygotskiy, S. D. Zabravnaya, I. Yu. Levchenko, A. R. Luriya, V. I. Lubovskiy, L. I. Moskovichyute, V. L. Naydin, N. B. Shabalina, V. P. Shestakov, V. M. Shklovskiy, etc.)

The technologies and methods of investigation of the structure of rehabilitation potential had been worked out over a number of years, but until the early 21st century there were no scientifically grounded methodology of complex evaluation of safe and impaired functions that would allow assessing the severity of the existing functional limitations and correlating them with the safe potential and level of social adaptation.

Among the diagnostic methods worked out in 2000-2012 making it possible to solve the problems of prediction and monitoring effectiveness of the rehabilitation process, special attention should be given to the "Method of evaluation of the degree of limitation of life activity of patients of psychoneurological profile by the coefficient of their functional state" (T. I. Burmistrova, V. N. Luchaninova, S. V. Osmolovskiy, 2010) a modification of which can be used to evaluate the effectiveness of rehabilitation process. The method of evaluation of the functional state and rehabilitation effectiveness demon-

strated its efficiency in the process of experimental approbation on a representative sample of those tested (913 patients of psychoneurological profile of various ages), which allowed us to consider the algorithm suggested by the authors as optimally matching the tasks of our research.

As part of our experimental work, we made up a program of experimental study of socio-communicative potential of persons with speech disorders which is an integrative parameter reflecting the peculiarities and degree of manifestation of disorders and safe links of the demand-motivational and operational components of the socio-communicative sphere of patients with speech disorders caused by organic lesions of the brain of various geneses.

We used the method of evaluation of limitations of socio-communicative functioning of the members of the experiment in order to achieve the aim of our research. Determination of the degree of manifestation of limitations of socio-communicative functioning was carried out on the basis of testing and subsequent evaluation of the data obtained in points. Then we calculated the general coefficient of

the socio-communicative potential with the help of the formula which took into account the following functional disorders:

- disorders of cognitive preconditions of social communication including impairment of attention, memory, visual, auditory and tactile gnosis and praxis;
- disorders of emotional-personal preconditions of social communication;
- disorders of psychological functions, thinking, and tempo of psychological development;
- disorders of the speech-communicative sphere;
- disorders of social interaction and behavior.

Each functional disorder (i) is divided according to tables 1-5 into five levels (j) depending on the severity of manifestation of the disorder, and evaluated on a five-point scale (bj) from $b_j = 0$ – high degree of disorder manifestation, where $j = 1$ to $b_j = 1$ – absence of disorder, where $j = 5$.

Then we calculate the coefficient of the functional state of the socio-communicative potential according to the formula:

$$K = \frac{\sum_{j=1}^{j=5} \left(\left(\sum_{i=1}^{i=n} B_i \right) \times b_j \right)}{m} \times 100$$

where n – number of impairments in each type of functional disorder, m – total number of evaluated disorders, B – type of functional disorder, B_i – presence of the given kind of disorder: yes – 1, no – 0; b_j – evaluation score calculated in the following way: given j = 1, b₁ = 0; given j = 2, b₂ = 0,25; given j = 3, b₃ = 0,5; given j = 4, b₄ = 0,75; given j = 5, b₅ = 1.

If K is more than 75%, we register a mild degree of limitation of socio-communicative functioning; if K is more than 50% but less than 75% – a moderate degree, if K is less than 49% – a severe degree.

The suggested method of evaluation of the degree of limitation of socio-communicative functioning of patients with speech disorders of various genes allows for objective evaluation of the level of the patient's socio-communicative capabilities and his ability to integrate in the society. In addition, on calculation of the coefficient of socio-communicative functioning before and after the logopedic rehabilitation procedures, the method makes it possible to objectively evaluate the effectiveness of the logopedic measures both on the whole and for each type of func-

tional disorder.

Our research allowed us to determine significant objective criteria for evaluation of the degree of limitation of the socio-communicative functioning of patients with various forms of speech disorders. Based on the coefficient of socio-communicative potential, we have singled out three levels of limitation of socio-communicative functioning.

I degree (mild limitation) – more than 75%. Patients with insignificant manifestations of socio-communicative disadaptation. In most cases, they had mild neurodynamic, emotional-personal and speech disorders and typical level of intellectual development; they did not practically need anyone's assistance, their behavior and actions were conscious and corresponded to the social norms, and their verbal and non-verbal means of communication were successfully used for socio-communicative interaction. It is typical of this group to show total absence of minimum presence of manifestation of personal and communicative disorders; average statistical indices of social status; conscious interest in communication; skills to orient in partners and

communication situations; slight inadequacy of the means of communication and cognitive sphere.

II degree (moderate limitation) – from 50% to 75%. Because of marked impairments of the demand-motivational and operational components, the patients of this group demonstrated stable personal and communicative disorders; medium and low status in social hierarchy; avoiding communication on the basis of verbal means, difficulties in social awareness, problems with the choice of the strategy of interaction with different partners in various communication situations, pronounced lack of means of communication; stable manifestations of underdevelopment of the cognitive preconditions of the communication process.

III stage (severe limitation) – less than 49%. The given group comprised patients with severe disorders of socio-communicative functioning. They were characterized by socio-personal immaturity or inadequacy; low status in social hierarchy; absence of the need to communicate; presence of clearly expressed stable communicative difficulties; salient inadequacy of speech competence, sharp limitation in the use of verbal and non-verbal means of communication; stable and evident symptoms of complex underdevelopment of higher psychological functions.

A variable program of logopedic rehabilitation accompanied by

a complex of other neuro-rehabilitation technologies was made up on the basis of the revealed tendencies.

The leading role in the process of rehabilitation belongs to the Department of Clinical Psychology of the Center of Speech Pathology and Neuro-rehabilitation which is the coordinating center of the specialized service providing assistance for adult persons and children with disorders of higher psychological functions (including speech) with focal lesions of the brain as a result of cerebrovascular accident, craniocerebral trauma and other diseases of the central nervous system. The specialists of this Department in partnership with the doctor carry out objective evaluation of rehabilitation potential of the patients on the basis of a complex analysis of results of neuro-psychological observation of the state of the higher psychological functions complemented by the data of X-ray and functional diagnostics, the data of laboratory analyses and program the rehabilitation rout engaging specialists of other departments if necessary.

In the course of realization of the individual program of rehabilitation, the specialists monitor all changes and in case of need correct the content of rehabilitation procedures.

The structural divisions of the

Center of Speech Pathology and Neuro-rehabilitation work in close partnership ensuring continuity of

the rehabilitation process at all stages of the compensation treatment and socialization.

Table 1

Peculiarities of the socio-communicative potential of patients with speech disorders caused by organic lesions of the brain of various geneses

Degree of limitation of socio-communicative functioning	Type of speech disorder									
	Motor aphasias				Stuttering					
	efferent N = 60		afferent N = 60		severe N = 55		moderate N = 42		mild N = 23	
I degree (mild limitation)	10	16.67%	14	23.34%	—	—	2	4.76%	19	82.61%
II degree (moderate limitation)	34	56.67%	38	63.33%	3	5.46%	38	90.48%	4	17.39%
III degree (severe limitation)	16	26.66%	8	13.33%	52	94.54%	2	4.76%	—	—

As a rule, the beginning of rehabilitation process immediately after the patient's coming out of a coma, stabilization of his vital functions and emergence of conscious activity takes place in the early rehabilitation ward (sometimes, in the reanimation department or intensive care unit) at in-patient clinics of the neurological or neuro-surgical profile. And the list of rehabilitation procedures includes both obligatory medical measures (medicamentous therapy, physiotherapy, therapeutic physical training, massage, etc) and specialized work on incremental stimulation and actualization of the swallowing function, restoration of the damaged functions of cognitive (gnosis, attention, praxis, memory,

etc.) and speech spheres (disinhibition of speech with the help of the means of non-verbal communication and other logopedic techniques) in accordance with urgent and potential capabilities of the patient. This work is first carried out in early rehabilitation wards, and then at specialized surgeries of therapeutic physical training, massage and logopedics by neuropsychologists, logopedists, specialists in neuro-motor training, etc. Multi-professional interaction is coordinated at this stage by the doctor in charge of the case.

Depending on the somatic and physical state of the patient, the peculiarities and degree of manifestation of disorders of the motor, speech and

cognitive spheres of the patient and other circumstances, the specialists decide upon the optimal conditions for his further neuro-rehabilitation. The optimal neuro-rehabilitation route after leaving the in-patient clinic is formed by the commission of the Center of Speech Pathology and Neuro-rehabilitation which includes specialists of various profiles, logopedists and psychologists.

The necessary volume of rehabilitation procedures is determined after complex observation of the patient at the consulting-diagnostic department of the Center by a psychiatrist, neurologist, cardiologist, therapist, physical training therapist, logopedist and neuro-psychologist.

On the basis of analysis of the observation results, the specialists of the selection commission evaluate the patient's referral to a subdivision of the Center of Speech Pathology and Neuro-rehabilitation (day in-patient department, daytime in-patient facility for teenagers and adults with stuttering, in-patient facility at home, children's department for logoneuroses, in- and out-patient complex for children or specialized surgeries of territorial polyclinics, psycho-neurological dispensaries, etc.).

Interdisciplinary complex treatment at the Center includes high-tech neuro-psychological

methods of diagnostics and programming the processes of rehabilitation, neuro-sensory and neuro-motor programs, overcoming the disorders of the body schema and special awareness, individual and group sessions with neuro-psychologist or logopedist, physical training therapy, robotics (Lokomat), hydro-kinesthetic therapy (therapeutic swimming), use of anti-gravitation suits, sole stimulators, etc. Creation of motivation and stimulation to specialist care is a most important task of work with the patient at all stages of treatment and neuro-rehabilitation.

The duration of treatment in each department of the Center is determined by the commission depending on the diagnosis. And the volume of complex rehabilitation measures for each patient provided by the Center departments or other divisions of the service (diagnostics, medicamentous treatment, physiotherapy, therapeutic physical training, massage, psychotherapy, logopedic lessons, neuro-sensory and neuro-motor training, work with computers, socio-therapy, etc.) are determined collegially.

The patients who have passed a course of intensive therapy and neuro-rehabilitation at the Center departments are sent to continue rehabilitation therapy at specialized logopedic consulting rooms of territorial polyclinics, polyclinics of rehabilitative

treatment, psycho-neurological and physical culture dispensaries at the place of residence or in-patient facilities at home. Thus, long-term continuing treatment and neuro-rehabilitation are provided as fully as possible.

Such system makes it possible to realize the most critical principles – continuity, duration and intensity and ensures consistency of multiprofessional interactivity of specialists,

which improves the effectiveness of treatment and neuro-rehabilitation and facilitates fastest restoration of the social functioning of the patient.

As a result of assessment of the indices of socio-communicative potential of the experiment participants at different stages of realization of the program of neuro-rehabilitation we have obtained the following data (Table 2).

Table 2

Dynamic indices of effectiveness of neuro-rehabilitation of patients with various forms of speech disorders, %

Degree of limitation of socio-communicative functioning	Type of speech disorder									
	Motor aphasias					Stuttering				
	efferent N = 60		afferent N = 60			severe N = 55		moderate N = 42		mild N = 23
I degree (mild limitation)	16.67	50.00	23.34	48.34	—	—	4.76	52.38	82.61	100
II degree (moderate limitation)	56.67	38.34	63.33	41.66	5.46	52.72	90.48	47.62	17.39	—
III degree (severe limitation)	26.66	11.66	13.33	10.00	94.54	47.28	4.76	—	—	—

Thus, our research shows that the suggested system of differentiated complex neuro-rehabilitation of patients with speech disorders and the method of evaluation of their socio-communicative potential have proved its practical significance and can be recommended for application at various rehabilitation institutions.

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