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TECHNOLOGY OF LOGOPEDIC EXAMINATION OF INFANTS DURING AN OUTPATIENT CONSULTATION

Abstract. The article presents a retrospective psycho-pedagogical study of infants, dwells on home and foreign methods and techniques of investigation of infants' development, and describes an original screening technology of logopedic examination of infants with congenital cleft lip and palate via observation of their psychomotor development. The study of infants is carried out throughout the first year of life divided into 4 age periods — 3, 6, 9, 12 months. The test tasks for each period are based on the age-related norms of psychological development of the child described in scientific-methodological literature. Specially created communicative situations allow the logopedists to take into account visual, auditory, tactile, articulatory and behavioral responses of the child; facilitate qualitative and quantitative assessment; the authors suggest variants of pedagogical conclusions and compile a list of the necessary diagnostic equipment. The originality of the diagnostic technology is determined by the long-term nature of pedagogical observation, standardization of the procedures of logopedic examination and the universal nature of the method to identify children at risk. The given technology can be used at health care institutions (hospitals and outpatient clinics), education, and specialized centers for early intervention.

Keywords: rhinolalia; preschool logopedics; speech disorders; infants; children with congenital cleft lip and palate; maxillofacial pathology; congenital cleft lip and palate; screening technology.

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The significance of early upbringing and education for the subsequent psychological and speech development of the child is evident, and the timely detection of the children with disabilities and early assistance to this category of children become especially widespread. Today, primary logopedic diagnostics and rehabilitation are held at children's policlinics and specialized centers. The infant stays at these institutions for a consultation lasting 3-4 hours and is examined by five or more specialists. A long stay away from home is uncomfortable both for the parents and for the infant due to their age-related, physiological and psycho-neurological peculiarities. Fast and high-quality pedagogical diagnostics which would allow assessing the level of development, revealing the problem and suggesting the solution, is rather urgent. In real practice, pedagogical diagnostics of the infant is limited to a talk with the parents about the peculiarities of the child's development and, at best, to a questionnaire. The results obtained are interpreted on the basis of the knowledge of the main regularities and norms of psychological development of infants.

The very first and most widespread norms of infant development in the world were obtained by A. Gesell. A. Gesell singled out the norms of infant psychological development using the following methods:

– prolonged observation (of the same children during a long stretch of time, more often from birth to adolescence);

– test experiment;

– twin method to analyze the developmental relations and social learning (comparative analysis of psychological development of monozygotic twins).

The author studied the behavioral manifestations of children in such areas as motor activity, language, and adaptive and social contacts; the facts were systematized and the regularities of psychological development were figured out. All findings were systematized in the "Tables of Development".

On the basis of the data obtained by A. Gesell, psychologists have actively worked on designing various development scales beginning with the 30s-40s of the 19th century up to now. The best known scales are the *Brunet-Lézine* Scale, the Bayley Scale, the *Uzgiris-Hunt Scale*, Ch. Bühler and H. Hetzer scale, «KID Scale», and «Kent Infant Development Scale». All of them contain a large number of questions (from 160 to 250 and more) in several areas of development (motor skills, visual-motor coordination, speech, social development, etc.). As a rule, the scales are filled out by parents, which

leads to subjectivism and distortion of real facts. Assessment of the child's achievements is made via the comparison of results in areas of development and the calculation of the summary indicator – "development coefficient".

Thus, due to its high-quality and complete translation into Russian, the Carolina Curriculum for Infants and Toddlers with Special Needs (by Nancy M. Johnson-Martin, Susan M. Attermeier, Bonnie J. Hacker) [7] has become widely known in our country. This diagnostic scale totals 529 indicators in 26 developmental domains.

The *Griffith* Mental Development Scales (GMDS) (translated by E. S. Keshishyan) are also oriented towards monthly assessment in 5 areas of psycho-motor development: motor skills, social adaptation, hearing and speech, eyes and hands, and playing skills, but presuppose three-level evaluation in each parameter. The diagnostic tests are simple, varied (though some of them can hardly be done in a policlinic, for example, it is difficult to assess "child's joy while bathing") and are aimed at identifying the "high-risk group".

In his book "Development in Infancy" (1985) [5], T. Bower describes numerous laboratory experiments carried out with infants and newborns in the 1960s. These experiments are complicated technically and are not meant for ample use.

D. Lashley [12] describes the "method of limited time test" as a technique of working with infants resembling programmed observation. The method suggests using special cards or charts to register the infant's behavioral responses at certain intervals of time, for example 30 seconds, according to the following criteria: physical development, communication and speech development, social contacts and playing, self-sufficiency and independence and behavior. The results of the programmed observation of the infant are compared with the average statistical norm or with the earlier results of the same infant.

In Russia, N. M. Shchelovanov (1920) used the method of continuous systematic observation recording all infant's responses emerging under the influence of external and internal stimuli and worked out diagnostic criteria and norms of infant psychological development. The phenomena indicating the level of psychological development are looked upon by him with reference to the stages of the nervous system maturity. I. L. Figurin and M. P. Denisova first published their co-authored work "A Brief Diagnostic Scheme of Infant Development" in 1926. The publication has practical focus and is recommended for use in crèches and children's homes.

G. V. Gridneva, M. Yu. Kistyakova and E. L. Frukht made a considerable contribution to elaboration

of the diagnostics of neuro-psychological development of one year old infants. N. M. Askarina (1969) [3] presented a diagnostics of neuro-psychological development of infants in the form of achievement test. Visual and auditory orientation responses, emotions and social behavior, hand movements and actions with objects, preliminary stages of speech development and skills were chosen as the main parameters of neuro-psychological development of infants. Testing is held in the form of an experiment. The significance of results is achieved through the use of a standardized procedure, uniformity of the test materials and instructions, time limits, and properly elaborated evaluation criteria. Such assessment of the psycho-motor development of infants corresponding to the behavioral manifestations and age-related norms was worked out by L. T. Zhukova and E. M. Mastyukova [8].

In the 1960s, M. I. Lisina [13] carries out a series of laboratory experiments (using the method of cross-sectional study) aimed at investigation of the processes of communication and cognitive activity in infants. The application of this method allows the researcher to process data for different age-related periods; to precisely express the value of the change in development between periods, both in relation to separate individuals and the whole group; to analyze the relationships and ties between separate components of development and development factors.

The method of O. V. Bazhenova "Diagnostics of Psychological Development of Infants" (1986) presupposed implementation of infant observation into wide practical activity of specialists. This method focuses on the interaction between the infant and the environment and on the formation of various kinds of activity (actions with objects and communication); the author singles out the features of the infant's active behavior in relation to the object and the adult. During infancy, diagnostics is performed at seven ages (2.0; 3.5; 4.5; 6.0; 8.0; 10.0; 12.0 months). Various groups of responses are assessed: motor, sensory, emotional, vocal, actions with objects and kinds of interaction with the adult. Four levels are identified within each response: absence of response, weak response, inadequate response, adequate response, – and three degrees of disorder: mild, moderate and severe. Unfortunately, the complex structure of observation encumbers its practical application [14].

E. I. Isenina [9] suggests a new diagnostic method – a specially created communicative situation. G. N. Lavrova (2004) [11] describes several diagnostic situations for infants differing in the degree of communicative activity of the adult,

and figures out the assessment criteria: initiative, sensitivity to the adult's intervention, means of communication – and variants of psychological conclusions: normal development, delayed development or severely delayed development.

The "GNOM" method of detection of the level of psychological development of children at an early age (by M. A. Kalinina, A. V. Goryunova, G. V. Kozlovskaya [10]) is designed to diagnose children between the ages of 1 month and 3 years and allows identifying three groups of children:

– typical children with the coefficient of psychological development (CPD) 90—110 points;

– risk-group children, CPD = 80—89 and higher than 110;

– children with pathology, CPD = 79 and lower.

The authors describe the observation procedure: the specialist examines the infant on a changing table, and the infant can see the mother or a close adult. Diagnostic tests cover 5 domains of psychological activity: sensory perception, motor skills, emotions, cognitive sphere, and biological and social behavior. Tests for 12 age groups consisting of 20 questions have been worked out for the infants, which means that testing can be held monthly and can embrace large groups of people.

Over recent decades, such authors as E. A. Akimova, V. M. Sklyadneva, A. A. Kuzivanova (2016) [1], E. F. Arkhipova (2005) [2], E. R. Baenskaya, M. M. Libling (2004) [4], E. B. Volosova (1999) [6], L. M. Kobrina, O. A. Denisova, A. V. Kalinina (2011) [10], Yu. A. Lisichkina (2004) [14], E. O. Smirnova, L. N. Galiguzova, G. V. Ermolova, S. Yu. Meshcheryakova (2007) [18], T. V. Pelymskaya, N. D. Shmatko (1995) [23], O. G. Prikhod'ko, O. V. Yugova (2016) [17], L. I. Fil'chikova, M. E. Vernadskaya, O. V. Paramey (2004) [21], have been engaged in working out the basic parameters to be taken into account in infant observation. In practice, the process of infant diagnostics is often chaotic, either compressed or stretched out, and unsystematic partly due to the absence of the ordered activity of the researcher.

We have designed and patented a diagnostic technology of observation of the psycho-motor development of infants with congenital cleft lip and palate via the leading kind of activity – communication. The technology has adapted the M. I. Lisina test "Observation of the Communicative Activity of Infants with Surrounding People" (1966) for a logopedic outpatient examination; the E. L. Frukht "Diagnostics of Neuro-Psychological Development of One Year Old Infants" (1987); and the E. B. Volosova "Infant's Development (Basic Indicators)" (1999). From the method of

M. I. Lisina, we have borrowed the standard situation of observation, from E. L. Frukht – the form of examination conduct, playing equipment and age-related norms, which have been modified by the materials of E. B. Volosova. Thus, the study of the psycho-motor development of infants with congenital cleft lip and palate was conducted under the conditions of an outpatient logopedic consultation, with the parents present, in the form of informal emotional communication between the pedagogue and the child. Taking into account the fact that the infant's state is more labile than at any other age, observation was carried out when the child was in the state of calm wakefulness (S. Miller, 2002 [16]; N. P. Shabalov, 1997 [22]). The parents were admitted to the procedure of assessment, which made it possible to take into account the family character of upbringing (Yu. V. Marchuk, N. V. Obukhova, 2006) [15].

Four blocks of assessment of psycho-motor-development have been worked out: visual, auditory, tactile-motor, and tactile-oral spheres, which allows detection of the local developmental problem. Each block has a standard specially created communicative situation and the expected responses of typically developing infants. The hypothesis poses that the state of the visual and auditory spheres will allow assessing the first phase of the act of movement – the orientative one; the tactile-motor and tactile-oral spheres are expected to reflect mostly the phase of movement performance (according to A. V. Zaporozhets). In cases when perception and transfer of information are impaired, we assume that the infants would be able to invent special, individual forms of communication with the surrounding people and objects, and therefore have included observation of the free activity of the infant in the procedure (fifth block).

The five blocks were used in two series of diagnostic tasks: basic tasks and additional tasks. The basic series of diagnostic tasks was presented in the "infant – adult" sphere of communication and involved direct contact of the infant with the adult. In the additional series of diagnostic tasks, the "infant – adult" sphere of communication was supplemented with an object or toy and accepted the form of "infant – adult – object". The additional series of diagnostic tasks allowed us to corroborate and specify the subjective data of the experimenter about the behavioral responses of the infant at the time of communication.

The series of the basic diagnostic tasks was performed first, and was followed by the series of additional diagnostic tasks.

The psycho-motor development of infants was studied at the ages of 3, 6, 9 and 12 months. For the ex-

perimenter's convenience, the diagnostic material is presented in the form of tables for each age-related period.

Table 1. Series of diagnostic tasks for 3 months old infants *(indicate the infant's position during examination – horizontal, on a changing table; horizontal in the arms of the adult)*

Method of stimulus presentation	Communicative situation and expected response	
	Basic series, *"infant – adult"* communication scheme	Additional series, *"infant – adult – object"* communication scheme
Visual sphere	The adult appears in the infant's field of vision (comes up to the infant and leans to his face)	The adult brings a bright toy in the infant's field of vision, holds it and moves it horizontally
	The infant fixes his eyes on the face of the adult	***The infant fixes his eyes on the object***
Auditory sphere	The adult pronounces the infant's name affectionately and carries on an emotional "talk" with the help of gestures and facial expressions.	The adult stretches their arms on both sides of the infant and shakes a rattle toy.
	The infant gives positive response to the conversation with the adult (is listening)	***The infant gives positive response to the sound of the object***
Tactile-motor sphere	The adult gently strokes the infant on the chest	The adult holds the rattle above the infant's chest in a position easy to catch the toy
	The infant gives positive response to stroking	***The infant catches the toy and holds it in his hand***
Tactile-oral sphere	The adult smiles, clicks his tongue and smacks his lips	The adult places a pacifier against the infant's lips
	The infant smiles in response to the actions of the adult	***The infant makes active movements with the lips and tongue***
Infant's free activity	The adult produces a "complex stimulus": contact look, smile, talk and stroking the infant	The adult shows the rattle toy to the infant and performs the "complex stimulus"
	The infant gives positive response and demonstrates a "liveliness complex"	***The infant watches the object and performs actions directed towards it***

Table 2. Series of diagnostic tasks for 6 months old infants *(indicate the infant's position during examination – horizontal (prone or supine) or vertical: sits independently or with support*

Method of stimulus presentation	Communicative situation and expected response	
	Basic series, *"infant – adult"* communication scheme	Basic series, *"infant – adult"* communication scheme
Visual sphere	The infant lies on a changing table. The adult leans to the infant's face, takes his arms and holds them above his face	The adult places an object within the infant's reach
	The infant holds his hands out to the face of the adult or plays with his fingers above his face	***The infant holds his hands out to the object, catches and looks at it***
Auditory sphere	The adult is at a distance from the infant (1m), emotionally pronounces its name making the vowels long, and produces the syllables A-GU, MU-MU	The adult is at a distance from the infant (1-2m) to the right/left and shakes the rattle
	Vocal response of the infant imitating the intonation of the adult: "A-MU"	**The infant turns his head toward the sounding object (sound localization)**
Tactile-motor sphere	The adult attracts the infant's attention and performs an action (knocks on the table or scratches it). The action is repeated 2-3 times.	The adult holds out a toy (12-15 cm in size) to the infant
	The infant tries to imitate the adult's movement	***The infant takes the object and sways it, placing it from one hand to the other***
Tactile-oral sphere	The adult pulls the infant's hand against his face and releases it. The action is repeated 2-3 times.	The adult puts a teething ring/pacifier into the infant's hand
	The infants puts his hands in the mouth	***The infant puts the objects in his mouth. Mark the following: the lips, tongue, lower jaw are active***
Infant's free activity	The adult talks emotionally to the infant, sings him songs, strokes or rhythmically pats on the arm or leg, calls his name	The adult places one or two bright rattles within the infant's reach
	The infant gives emotional response, carries on communication with the adult, displays initiative	***The infant manipulates the objects (turns them, knocks, places the object from one hand to the other) or hands the object over to the adult***

Table 3. Series of diagnostic tasks for 9 months old infants *(indicate the infant's position during examination – horizontal (prone or supine) or vertical: sits/walks independently, sits/walks with support, crawls typically / in a specific manner)*

Method of stimulus presentation	Expected response	
	In the *"infant – adult"* communication scheme	In the *"infant – adult – object"* communication scheme
Visual sphere	The experimenter appears in the infant's field of vision, greets him and calls his name.	The adult holds out 2-3 toys (up to 15 cm in size) to the infant
	The infant gives negative response to the appearance of an "alien" adult person	***The child manipulates the objects both separately and at the same time***
Auditory sphere	The adult calls the infant's name and pronounces the phrase "Where is mom?"	The child is given two externally similar objects (one sounding and the other mute)
	The infant turns his head towards his mother, hides behind mother or gives another adequate response in her direction	***The child manipulates the objects, singles out one of the – the sounding one, and concentrates his attention on it***
Tactile-motor sphere	The adults gives an emotional stimulus to clap hands	The adult shows the infant an action: to put balls into a toy bucket and pour them out
	The child imitates the adult's playing action	***The child performs two (three) actions with the object one after another (takes, puts, pours out)***
Tactile-oral sphere	The adult emotionally urges the infant to repeat a song "A-A-A", "AM-AM"after him	The adult demonstrates a "kiss"/"lip smack" and urges the infant to repeat the action
	The infant imitates the adult's intonation and rhythm. Phonetical variety should be recorded.	***The infant repeats the articulatory action after the adult ("kiss", "lip smack")***
Infant's free activity	The adult stops emotional communication with the child, but stays by his side	The adult asks the infant to repeat the playing actions with the ball (throw, roll), tumbler (sway), box (open, close)
	The infant urges the adult to communicate or demonstrates a negative response to attract attention to himself	***The infant imitates the adult's actions with the objects. Attention should be paid to the quality of action performance***

Table 4. Series of diagnostic tasks for 12 months old infants *(indicate the infant's position during examination – horizontal or vertical: sits/walks independently, sits/walks with support, crawls typically / in a specific manner, can sit down on a small chair or squat)*

Method of stimulus presentation	Expected response	
	In the *"infant – adult"* communication scheme	In the *"infant – adult – object"* communication scheme
Visual sphere	The adult greets the infant with a gesture	The adult shows an action with a mechanical toy car (press the button)
	The infant fixes, watches and understands the gesture greeting	***The infant imitates the adult's action with the mechanical toy (press the button)***
Auditory sphere	The adult addresses the infant from the distance of 2-3m.	The adult sways a toy cat and sings: "Tra-ta-ta, my vezem s soboy kota"
	The infant understands a simple phrase without a gesture, for example, "come up to me"	***The child performs rhythmic sways to the music***
Tactile-motor sphere	The adult suggests a familiar game: " oroka", "Ladushki", "Mishka kosolapyy"	The adult asks the infant to repeat playing actions with a stacking toy or cubes
	The infant performs 2-3 successive actions: after demonstration or from memory (to be indicated)	***The infant plays with the stacker (takes the rings off and tries to put them in place), builds up a tower of 2 cubes***
Tactile-oral sphere	The adult emotionally urges the infant to repeat the babbling words "MAMA, PAPA, BABA" etc. after him.	Via the parents' questionnaires or through observation of the infant's actions the pedagogue specifies the child's ***ability to drink from the cup, eat thickened cereal, or munch an apple***
	The infant repeats the words after the adult (immediately or after some time)	
Infant's free activity	Emotional communication with the child about family, toys, clothes, food, walks	The adult creates a playing situation; demonstration of actions with the objects is possible
	In communication with the adult, the infant uses gestures and intonationally and rhythmically organized vocalizations, resembling simple words	The infant performs object-oriented and correlative actions (feeds a doll, combs the hair, pulls a toy cart)

In the course of examination, the logopedist observes the process of completion of the diagnostic tasks. These data will constitute a qualitative assessment of the psycho-motor and communicative behavior of the infant in the given situation. The qualitative assessment reflects the specificity of communicative behavior: speed of response, and peculiarities and effectiveness of the contact between the experimenter and the infant. The quantitative assessment of each diagnostic task was carried out separately. A three-point scale was used. If the response to a stimulus corresponded to the age-related norm, the task received 1 point; if the response was immature – it was evaluated at 0.5 points; if the was no response to the stimulus – 0 points were given. An immature response differs from the normal one in its fragmentary or distorted form of expression.

After calculation of sub-total points in the basic and additional diagnostic tasks, the results were compared between themselves, and the psycho-motor development of the infant was evaluated according to the highest score. Thus, if the total score was:

- from 10 to 7.5 points, the infants development was assessed as being within the age-related norm;
- from 7.4 to 5.0 points, the infants development was assessed as delayed (2 epicrises below the developmental norm);
- from 4.9 to 2.5 points, the infants development was assessed as retarded (3 epicrises below the developmental norm);
- lower than 2.4 points, the infants development was assessed as severely retarded (4 epicrises and more below the developmental norm).

The epicrisis during the first year of life is 1 month long (R. V. Tonkova-Yampol'skaya et al., 1989) [20].

One examination of an infant occupied 30 minutes of working time, during which it was necessary to figure out the structure of the infant's communication with the adult, and to detect the behavioral peculiarities of the child during communication.

Examination did not demand bulky or special didactic equipment. At the ages of 3 and 6 months, examination was carried out on a changing table; at 9 and 12 months of age, the infant could be examined in a special children's armchair with a table or on a carpet.

The list of didactic equipment:

- a red rattle toy 7-12 cm in diameter with a convenient handle (for 3 months old infants);
- 3—4 rattle toys, different in color, sound and kind of grip (for 6 months old infants);
- pairs of sounding and mute toys 7-15 cm in diameter (for 9 months old infants);

- a mechanical toy — a car (with buttons to press), a toy cart;
- a stacking toy or an easy-to-open nesting doll / box, nesting toy forms (for 12 months old infants);
- a doll (30—40cm) with a set of toy dishes, comb and a little bed (for 12 months old infants).

Thus, the pedagogical technology of examination of infants includes the content part, the qualitative and quantitative assessment, the conclusion and the diagnostic material.

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