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Research Article

CHARACTERISTICS OF GENERAL AND SMALL MOTOR FUNCTIONS IN CHILDREN WITH DYSARTRIAN SPEECH DEFICIENCY

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ABSTRACT

This article reveals specific defects in the development of movement in children with dysarthria, ie poor coordination of complex movements, speed in performing well-defined movements, decreased agility, poor hand motor skills, poor finger movement, general coordination.

KEYWORDS

Dysarthria, speech deficiency, general and minor motor functions in children.

INTRODUCTION

Speech itself represents a set of complex neural processes that take place through the interaction of different cortical and subcortical areas of the brain.

The following biological conditions are necessary for the formation of speech activity: hearing, vision, preservation of kinesthetic analyzers and the degree of maturity of the nervous system, timely transmission of information from external objects and impulses from receptors in the body to the central nervous system. The afferent system plays an important role in the development of speech movement, emotional volitional functions in the child. Speech perception is achieved through the interaction

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of auditory and kinesthetic analyzers based on the analysis and synthesis of audible sound elements.

The main results and findings

The process of pronunciation of sounds in speech is a complex coordinated articulator, a system of actions, which is formed primarily on the basis of individual skills and the collaboration of kinesthetic and auditory analyzers.

A complex brain system stores information, processes it, and develops a program of response actions. The speech functional system performs the transmission of speech information. To do this, a mobile effective system of the brain is used.

Injury to these systems results in dysarthria, which is a direct disruption of the mechanism of action of speech.

In children with dysarthria, muscles become tired rapidly at functional pressures with limited motor activity. He can't stand on one leg, he can't jump on one leg, he can't cross the bridge, and so on. Badly imitates actions: how a soldier walks, how a bird flies, how he cuts bread, and so on. Motor insufficiency is especially evident in physical education and music classes, where children lag behind in the pace and rhythm of movement, as well as in the transition from one movement to another.

Children with dysarthria learn self-care skills late and with difficulty: they can't button up, can't tie their scarves, and so on. He holds the pen badly during drawing lessons, his hands are under pressure. Most people hate drawing. The motor roughness of the hand is especially evident in appliqué and plasticine handling exercises. Difficulties in spatial placement of elements are also observed in application work. Disorders of fine differential movements of the hands are detected when performing finger gymnastics. Children have difficulty or are unable to perform actions based on imitation without outside help; for example: "lock" - joining the palms by inserting the fingers between each other; "Rings" - a combination of index, middle, anonymous and silent with the thumb and other finger gymnastics exercises.

In construction classes, children experience great difficulty and are unable to perform even the simplest movements. Also, children are not able to perform the delicate hand movements and spatial targeting required. According to their mothers, most children are not interested in building games until the age of 5-6, do not know how to play with small toys, can not put them together.

The unity of general and speech motor skills has been proved by the researches of famous scientists MP Pavlov, A. Leontev, A. Luria.

As the child develops movement, coordination of movement develops. The formation of movement contributes to the development of speech. Precise exercises performed for the head, arms, waist and legs, improve the movements of the articular organs: lips, tongue and lower jaw. Speech development, in particular, is inextricably linked to the delicate movements of the fingers.

A person who cannot find a word to explain his point often helps himself with a hand gesture. On the contrary, a child who is writing or drawing helps himself by speaking without understanding. Koltsova MM, a scientist who has scientifically studied the development of speech in children, writes: The movement of the fingers is historical, it is inextricably linked with the functions of speech development [7].

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The development of motor functions in the ontogenesis of children improves over many months and years. In the research of psychologists, especially American psychologists, a great deal of attention has been paid to the question of whether the development of large and small motor skills in a child is the result of natural maturation or the result of training. Early work in this process focused on the world of natural maturation (Dennis.W), and later research has argued that natural maturation and learning factors are equally important for the formation of children's motor skills (Halverson H.M., Munn.N).

German physician K.P. Becker addressed the issue of the organic connection between speech activity and motor centers. There are such views in the views of K.P. Becker and M. Savak. “If we look at speech from the point of view of the process of action, then the violation of the act of speech can be interpreted as a movement disorder. This disorder sometimes manifests as a separate speech disorder i.e. it does not affect major motor skills. Conversely, a major motor impairment results in a minor motor impairment that manifests itself in speech disorders. In this case, speech disorders can occur due to damage to motor centers and pathways, as well as due to the functional backwardness of normal motor processes [3].

German scientist Luxzingir emphasized the link between severe speech impairment and minor movement disorders. He divided children with motor impairment into 3 groups and found that the deeper the impairment of fine motor skills, the more profound the speech defect. We can see the same idea in the works of Russian scientists. In particular, V.M. Bekhterev writes that the movement of the hand is always inextricably linked with speech and contributes to its development.

Among other movement functions, the movement of the fingers is important. Because the movement of the fingers has a great impact on the development of high nervous activity in the child.

L.F.Fomina studied the effects of hand movements and general motor movement on the development of active speech.

An analogous study by V.M. Bekhterev in a control group showed that exercise of the fingers accelerates the functional maturation of the brain for two and a half months. From our point of view, these data allow us to assume that the movement of the fingers really enhances the maturation of the central nervous system, and the acceleration of speech development in children is one of the manifestations of this. These facts show the seriousness of the problem of training the small movements of the fingers of both hands in connection with the development of speech areas in the cerebral hemispheres.

MM Kolytsova currently recommends us to use the following tests to determine the level of speech development in children under 3 years of age: we ask the child to point one finger, two fingers, three fingers. In all the cases examined by us, children who are able to perform individual movements of the fingers have well-developed speech. In this case, without talking to the children, it is possible to determine whether his speech is sufficiently developed or not.

MM Kolytsova's scientific articles contain the following sentences: "The work on training the small movements of the fingers can be started very early, from 3-4 months of age." Initially, this work begins

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with massaging the baby's hand paws and passive bending and straightening. From 7 to 8 months, you can easily switch to active exercise [7].

M.Akenova made observations in all groups of speech kindergartens and stated in her article: "Scientists have noted that systematic work on the exercise of fine finger movements, in addition to accelerating speech development, is a powerful tool to increase the working capacity of the cerebral cortex. it improves children's attention, memory, vision and hearing. At the same time, it is not recommended to give children suffering from epilepsy complex exercises for the fingers "[1].

Many scientists (M.I.Koltsova, E.I.Isenina, A.V.Antakova - Fomina, etc.) believe that the development of fine motor skills is assessed as a positive factor in the formation of children's speech.

Thus, the formation of the child's speech begins after the development of the movement of the fingers (V.B.Galkina, N.Yu.Khomutova). Therefore, if a child has a speech impediment, special attention should be paid to training his fingers.

VP Dudev continues exactly these ideas. He writes that the child's subject-manipulative activity has a stimulating effect on speech function. This process is the basis for important special work on the correction of fine motor skills in children with speech impairment [6].

N. A. Bernstein developed the theory of the organization of action and brought speech to a higher level of organization of action. Bershtein identified the stages in the implementation of the independent movement. At the initial stage, the self-assessment of the condition of the individual attached to this condition is carried out. In the second stage, a moving task and an image of the process that is required are expected. The driving task becomes increasingly complex. The MNS generates during the execution of the action the correctness of the set driving task and the future form of movement. In the third stage, the programming of the solution of the identified task, that is, for the individual to perform the next action, he himself creates the purpose, composition of the action and the assignment of the necessary means. In the fourth stage, action is done with evidence: the person overcomes all redundant actions, transforms it into a controlled system, and performs the desired goal-directed action. This is only possible when the individual has coordination of action. Disruption of one of the coordination structures leads to movement disruption [4].

Motion coordination develops gradually based on experience and training, as this complex sensomotor communication begins with afferent flow and ends with a proper central response.

L.V. Fomina examined the children in different institutions and found that the development of speech level was always closely related to the level of development of fine movement of the fingers.

Neuropathologist and psychiatrist V.M. As Bexterev writes, the function of hand movement is always associated with the function of speech, and the development of the former leads to the development of the latter.

S. Pavlov's theory that "speech is, first of all, the feeling of muscles from the organs of speech to the cerebral cortex" is proved by many studies of children's speech. Therefore, while studying the problem of the child's speech maturity, the idea of using muscle sensations in the speech apparatus came to mind. When we look at the "map" of the

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brain, we see that the moving speech region is located next to the moving region, and the moving projection area is occupied by the wrist projection, which is very close to the speech motor projection.

Fine motor skills are conditioned by the defined work of the motor muscles of the hand and eye. It is necessary to study it, because the knowledge of fine motor skills helps the child to search, compare, classify his objects and thus understand the world in which he lives. Fine motor skills help the child to increase self-esteem, self-esteem, through self-service, self-action. They facilitate participation in games (of school age), i.e., help in gaining a social experience.

Known as 'motor speech', the articulation of sounds is done through the movements of the lips, oral cavity, throat, respiratory organs. The projection of the movement of the speech organs is carried out in the lower front of the central limbs, the implementation of movement coordination is carried out through the speech-movement center Broka, located in the lower forehead of the brain. The projection of the movement of the various parts of the body occupies one-third of the area occupied by the projections of the movements of the claws in the central limbs. In addition, the motion projections of the palms and the speech zones are located in close proximity. Exactly the size of the area of the projection of the paws and its proximity to the speech motor zone, scientists have come to the conclusion that the development of small arm muscles through exercise has a greater impact on the active development of speech in children.

Approximately the same is true of child speech development. First the fine movements of the fingers of the hand develop, then the articulation of the joints appears, and the improvement of subsequent speech reactions is also directly related to the degree of exercise of the finger movements.

When electrophysiological studies of high nervous activity in children were performed in the laboratory, it was found that when a child performed rhythmic movements with his fingers, there was a sharp increase in voluntary movements in the forehead and upper parts of the brain. If the child makes rhythmic movements (bending, stretching) with the fingers of the right hand, then there is a proportional increase in electrical vibrations in the left hemisphere of the brain in the upper zone and exactly in the forehead. The movements of the fingers of the left hand were similarly active in the right hemisphere.

An analysis of the literature cited above shows that the problem we are studying has not been studied in our republic. Therefore, we set ourselves the goal of studying the specific features of general and minor motor functions in children with dysarthria, and set a number of tasks to achieve our goal.

Carrying out the tasks of the research, the results of speech therapy examination allow us to have a complete picture of the specific features of motor activity in children with dysarthria of preschool age.

We conducted a speech therapy examination in the following areas:

1. To study the state of development of fine motor skills.
2. To study the state of general motor development.

Given the state of fine motor skills in children with dysarthria, we selected the following tasks.

- Squeezing the rubber ball;

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- Alternately bring the fingers to the position of the fist and open;
- Tap your fingers on the table one after another at a given speed;
- Pull the rope with different fingers;
- Roll the pen with your fingers;
- Dial the beads in one line;
- Pin the buttons.
- Opening and closing between fingers;
- Express the movement of fingers sprinkling a pinch of salt;
- Put a matchstick in a container.
- To check the general motor condition, we selected the following tasks:
- Running on the task first on 2 legs, then on one leg;
- Stop at the signal when walking, running, jumping;
- Throwing and catching the ball;
- Walk straight along the drawn line;
- Walking backwards;
- Walking the snake from the symbols;
- Jumping on two legs (distance);
- Drop the ball into the basket from a certain distance.

We conducted our experimental work in the preschool No. 560, Yunusabad district, Tashkent. 10 children aged 6–7 years with dysarthria were selected for the study. Of these, 6 were boys and 4 were girls.

In Phase I, we interviewed group speech therapists and parents. During the interview, we identified the child's developmental history and studied the children's documents.

In stage II - based on the above methodology, we checked the children's motor activity and recorded it on the speech card.

In stage III - we observed children during various activities (play activities, visual activities, training activities).

Before examining the children, we collected complete data on their physiological hearing, intellectual status, and vision.

The results of the small hand motor motor mobility test are presented in Table 1.

Table 1

Results of a fine hand motor test

№	Types of movement	Scores of children			
		4	3	2	1
1.	Tighten the rubber ball.		40 %	60%	
2.	Bring and open the fingers alternately in the fist position.	10 %	40 %	50 %	
3.	Tap your fingers on the table one after the other at the given speed.			80 %	20 %
4.	Pull the rope with different fingers.		60 %	20 %	20%
5.	Roll the pen with your fingers.		70%	20%	10%
6.	Turn the beads into 1 line.			60 %	40 %

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7.	Push the buttons.		30 %	40%	30 %
8.	Open between the fingers and close tightly.		100 %		
9.	Express the movement of the fingers sprinkling a pinch of salt.			80 %	20%
10.	Put the matchstick in the pot.		20%	60%	20%

A study of fine motor skills in children with dysarthria revealed the following: 40% (4) of children performed the task of squeezing a rubber ball slowly, and 60% (6) of children performed the task with difficulty. 10% (1) of the children completed the task of bringing and opening the fingers alternately with the fist, 40% (4) of the children completed the task slowly, and 50% (5) of the children completed the task with difficulty. 80% (8) of the children had difficulty completing the task of hitting their fingers on the table in a row at a given speed, while the remaining 20% (2) of the children were unable to complete the task. 60% (6) children completed the task of pulling the rope with different fingers slowly, 20% (2) completed the task with difficulty, and 20% (2) children did not complete the task. 70% (7) of the children completed the task of rolling the pen with their fingers slowly, 20% (2) of the children completed the task with difficulty, and the remaining 10% (1) of the children failed to complete this task. 60% (6) of the children completed the task of dialing the beads in one line, while the remaining 20% of the children were unable to complete the task. 30% (3) of the children completed the button-tapping task slowly, 40% (4) of the children completed the task with difficulty, and 30% (3) of the children failed the task. 100% (10) children completed the task of opening and closing between the fingers slowly. 80% (8) of the children had difficulty completing the task of expressing the movement of the fingers sprinkling a pinch of salt, while the remaining 20% (2) of the children could not complete the task. While 20% (2) children completed the matchstick task slowly, 60% (6) children did it slowly, and the remaining 20% (2) children did not complete the task.

The study found that children lagged behind their normally developing peers in clearly returning to movement tasks in terms of spatial and temporal parameters. The children broke the sequence of movement elements in the given tasks, leaving out certain parts.

The children looked with great interest at the tasks selected to test fine motor skills, but had difficulty performing them. Most of the children completed the tasks slowly.

The data obtained from the examination of the general motor condition are presented in Table 2.

Table 2

Results of general body movement examination

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№	Types of movement	Scores of children			
		4	3	2	1
1.	The task is to run first on 1 foot and then on 2 feet.			60 %	40 %
2.	Walking, running, jumping, stopping at the signal.			70%	30 %
3.	Throwing and catching the ball.			40 %	60%
4.	Walk straight along the drawn line.			60 %	40 %
5.	Walk backwards.			40 %	60 %
6.	Walking the snake from the symbols.			70 %	30 %
7.	Jump on 2 legs (distance).			10 %	90 %
8.	Dropping into a ball basket from a certain distance.				100 %

The study of general motor status in children with dysarthria allowed to identify the following cases:

On the task, 60% (6) of the children completed the task of running first on 1 leg and then on 2 legs with difficulty, and 40% (4) children were unable to complete the task. In walking, running, and jumping, 70% (7) of children completed the signal stop task with difficulty, and 30% (3) of children failed to complete the task. 40% (40) of the children completed the task of throwing and catching the ball with long difficulty, while the remaining 60% (6) of the children were unable to complete the task. While 60% (6) of the children did the flat walking task on the drawn line with difficulty, 40% (4) of the children did not complete it. 40% (4) of the back walking task was completed with long difficulty, while the remaining 60% (6) of the children were unable to complete it. Of the conditional signs, 70% (7) of children completed the snake trail walking task with difficulty, while 30% (3) children did not. 10% (1) of the 2-legged jumpers completed the task with difficulty, while the remaining 90% (9) of the children failed to complete the task. 100% (10) children failed to complete the task of putting the ball in the basket from a certain distance.

They had difficulty rolling the ball from hand to hand, throwing the ball from a short distance, hitting the ball on the floor with one hand alternately, and jumping with the left and right feet.

There were frequent cases of swaying in children while holding a certain position, but the children tried to maintain balance. They were able to hold the balance well while standing on their right foot. There were cases of difficulty in maintaining balance in the left leg, in which case the children tried to hold the armrest of a chair standing nearby with their hands.

The assignments presented posed some challenges for children with dysarthria. In the course of the inspection, abruptly expressed lethargy, stiffness in one condition, special features were identified. Children with dysarthria had difficulty performing movement tasks such as throwing a ball from a short

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distance, jumping on the left and right foot, throwing and catching a ball, and walking straight along a drawn line.

Thus, dysarthria was observed in children with speech impairment, along with general somatic impairment and slowing of the development of locomotor functions, as well as specific defects in the development of the motor area. Lack of movement in children with dysarthria: manifested in the form of poor coordination of complex movements, a decrease in speed, agility in performing clearly defined movements. Based on the results, the need for complex development of articulatory motor and fine motor skills of the fingers was identified as part of the correctional work on the pronunciation of speech in preschool children with dysarthria.

CONCLUSION

In conclusion, it should be noted that the systematic use of speech therapy and the implementation of correctional work in the correlation between articulatory and fine motor development in the correction of speech defects in preschool children with dysarthria increases the overall effectiveness of speech therapy.

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