

NEUROLOGICAL FEATURES OF TIC HYPERKINESIS IN CHILDREN

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Abstract. *The article presents examination data of 70 children with tic hyperkinesis. Tic hyperkinesis affects the cognitive and emotional spheres, and these changes are most pronounced with common tics. Based on the Toulouse-Pieron test, which characterizes the ability to voluntarily concentrate attention, it has been proven that children with local tics have a significantly higher concentration of attention compared to common ones.*

Keywords: *tic hyperkinesis, psychological status, children.*

Relevance. Most often, the debut of the development of tics in children is accompanied by the presence of the effect of unfavorable exogenous factors. About 64% of tics in children develop against the background of stress - disruption of adaptation at school, additional courses of study, uncontrolled viewing of television or spending time in front of computer monitors, as well as conflicts in the family or isolation from one of the parents, as well as due to hospitalization. In the last decade, much attention has been paid to the cognitive and behavioral disorders that accompany tics.

Most often, tics are formed in children with the presence of central nervous system pathologies, such as ADHD, cerebrotrophic syndrome, anxiety disorders, which can be total, or all kinds of phobias and obsessive-compulsive disorders.

Today, neurophysiology places emphasis on the dominance of sympathetic activity in the state of the nervous system of children in early childhood with the presence of tics. The relative weak development of inhibitory mechanisms most likely becomes the cause of the development of foci of increased activity in the central nervous system, which becomes the basis for the development of all kinds of central nervous system pathologies [1,2,3]. The “organic background”, which is a small manifestation of a neurological deviation of a prolonged course, is often stopped due to the high adaptive capabilities of the child’s brain. It is worth noting that under the effect of exogenous factors such as pathologies of an infectious nature, emotional stress, both acute and chronic, causes a decrease in adaptation processes, thereby provoking the re-development of hyperkinesis. As a result, without separately identifying both psychogenic and organic pathologies, we can conclude that there is a dominance of one of the factors [1,2,3,4].

The purpose of the study was a study of clinical, neurological and cognitive characteristics in tic hyperkinesis in children with optimization of therapy.

Research material 70 children aged from 5 to 14 years appeared. The main group included 50 children with tic hyperkinesis, who were divided into 2 subgroups. The first group with local tics included 30 children with hyperkinesis of predominantly facial muscles; in the second - 20 children with common tics with hyperkinesis of the muscles of the face, head and neck, shoulder girdle, abdominal and back muscles. The control group consisted of 20 practically healthy children of the same age. The work used clinical, neurological, laboratory, and instrumental research methods.

Some of the subjects were noted to have parallel current pathologies that involve the hepatobiliary system: thus, in 59.2% of cases, the presence of bile duct dyskinesia was noted, in 18.3% of cases, the presence of cholecystitis was detected, among gastrointestinal pathologies, colitis was noted in 19.2% of cases, anemia was detected in 32.5% of cases, of the diseases of the ENT organs, every fourth one has tonsillitis, in 19% of cases rhinosinusitis, diseases of the nasopharynx were detected in 10.8% of cases. Based on the results of collecting anamnesis, the following list of past pathologies was compiled: viral hepatitis A is noted in 11.7% of cases, infections in childhood were detected in 76.7% of cases. Patients are diagnosed with frequent acute respiratory viral infections (98.3%), as well as colds; the number of diseases during cold periods was noted more than 3 times, which indicates a low immune activity of the body.

To study the cognitive sphere, the Toulouse-Pieron test was used, which provides information about more general characteristics of performance, such as fatigue, the duration of the cycle of stable performance, the frequency of distractions and differences in the speed of work. The Toulouse-Pieron test allows you to find out during what period of time a child can carefully, without distraction, follow the teacher's explanation, i.e. evaluate his voluntary attention.

Results and discussion. In the study group, the factors provoking the debut of tic hyperkinesia were: stress - 11 children (22%), starting school (school adaptation stress) - 7 children (14%), intercurrent diseases (most often colds) - 16 children (32%), in other cases the provoking factor was not identified. During the study of the neurological condition in this group of children, scattered micro symptoms were revealed, such as increased activity of tendon and periosteal reflexes, which were observed in 76%, which is 19 of the studied, while in 48% of cases, which is 12 children, fibrillar twitching of the tongue was noted, and in 44% of cases, which is 11 people, a slight trembling of the fingers is detected when the fingers are extended.

The Toulouse-Pieron test initially has a vector for studying indicators of attention (concentration, stability, switch ability), as well as psychomotor status, then the accuracy and reliability of the analysis of the data obtained, control of will, personal characteristics of performance, as well as performance status over a period of time are assessed. The main indicator is the accuracy coefficient of the Toulouse-Pieron test, which characterizes the development of voluntary attention and, in particular, the ability for voluntary concentration. It is this indicator that needs to be analyzed first, comparing the resulting numerical value with the standards.

Analysis of the tests showed a significant decrease in the coefficient of concentration in children with local tics and widespread tics compared to the control group ($p < 0.001$). Children with tics made more errors and omissions. The accuracy coefficient for completing the task was significantly lower in children with tic hyperkinesia in almost all groups $p < 0.05$. The accuracy of the task depends on the number of correctly processed characters and the number of omissions and errors (Table 1). The number of errors in the group of children with tics varied from 3 to 26 for local tics and from 3 to 29 for widespread tics. Some children made mistakes due to lack of self-confidence, haste, and the desire to show the best result. Performance indicator (productivity) - depends on the number of characters viewed and on the accuracy of execution. The more characters viewed and the higher the accuracy of execution, the better the result. Work productivity in children with tics was significantly lower in all age groups ($p < 0.001$).

The coefficient of attention switching reflects the number of errors as a percentage; the higher the indicator, the worse the result. In children with local and widespread tics, the percentage of errors was 1.5-3 times higher ($p < 0.05$).

Table 1

Initial indicators of the Toulouse-Pieron test in the examined children in a comparative aspect

Age groups	Execution speed (k)				
	pathology	weak	Middle or age norm	good	high
	0.89 or less	0.9 -0.91	0.92-0.95	0.96-0.97	0.98-1
Local tics (n=20)	15%) 0.89	4 (20%) 0.9±0.01	8 (40%) 0.94±0.03	6 (30%) 0.96±0.02	15%) 0.98±0.01
Common tics (n=30)	3 (10%) 0.89±0.02	10 (33.3%) 0.91±0.01	14 (46.7%) 0.93±0.02	3 (10%) 0.96±0.01	-
Control	-	-	4 (20%) 0.95±0.02	6 (30%) 0.97±0.01	10 (50%) 0.99±0.02

The pace of task completion in all children with tics was significantly slower compared to the control group ($p < 0.001$). In the examined group, there was a decrease in involvement in work; the number of processed stimuli in the first minute was generally less than in subsequent minutes. After the “damn” signal, the children did not immediately continue working. Some children showed a focus on speed, and the number of errors increased. Based on the data obtained, it was revealed that children with local tics, compared to widespread ones, have a significantly higher concentration of attention.

Conclusions: Tic hyperkinesia affects the cognitive and emotional sphere, and these changes are most pronounced with common tics. Based on the Toulouse-Pieron test, which characterizes the ability to voluntarily concentrate attention, it has been proven that children with local tics have a significantly higher concentration of attention compared to common ones.

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