Characteristics of development of voluntary attention of children of primary school age with ADHD

Anatoly Belousov, Tatiana Goryacheva

npsbelousov@mail.ru; tg_goriatcheva@mail.ru

Pirogov Russian National Research Medical University, Moscow, Russia

Various types of attention derangements can be seen in children with hyperactive disorder but when diagnosing only attention deficit is registered. It reflects the characteristics of behaviour mentioned as criteria in international classifications such as DSM-V and ICD-10.

The main attention characteristics can have various indexes depending on the character of the activity. The changes in the indexes of those characteristics are accompanied with the activation of the corresponding structure and that allows building up hypotheses specifying the character of attention derangement caused by certain CNS pathology. Studying this issue leads to designing either more specific intervention programs or effective recommendations for organizing learning activity for such children.

The research aim is analyzing the characteristics of voluntary visual attention of children in the age from nine to eleven years with hyperactive disorder with attention deficit.

The research sample consists of 50 children, 25 of them with a diagnosis code F90.0 Attention deficit hyperactivity disorder. The control group includes 25 children with neither neurological nor psychiatric diseases in anamnesis, with good progress at school and no sufficient complaints of their parents and teachers on child's behaviour.

The research methods include six consequent techniques, given in the following order: Bourdon test for evaluating concentration and stability of attention in the beginning of the research

Comparison of characteristics (Cohen's Test) for evaluating attention sharing, Schulte table test for evaluating attention volume; Ray's twisted lines test; Pieron-Rouser test for evaluating shift of attention; shortened five-minute Toulouse-Pieron attention test for evaluating concentration and stability of attention in the ending of the research.

The research shows that the children with ADHD demonstrate derangements in concentration degree, stableness, distribution, volume and shift of attention comparing with the children of the control group.

Table 1- The results of the Cohen's test

Group	Time indexes (in sec.)					Mistakes			
	T ₁	T ₂	T ₃	T ₄	D	T ₁	T ₂	T ₃	T ₄
ADHD	54,6	82,36	97,52	225,08	45,2	0	2	4	3
Control	45,4	75,8	94,04	183,16	13,32	0	1	1	3

Table 2- The results of the Schulte table test

Group	T1 (sec.)	T2 (sec.)	T3 (sec.)	T4 (sec.)	T5 (sec.)
ADHD	66,24	65,72	65,48	68,76	65,16
Control	47,20	48,96	52,80	49,96	48,96

Table 3- The results of the Pieron-Rouser test

Group	Average number of the characters run over	Average number of errors	S
ADHD	63,3	1,17	0,236
Control	73,04	0,56	0,291

Fig. 1 – Dynamics of speed changes in the Bourdon test

The fatigue as a result of a series of several consequent tasks reflecting various attention characteristics comes sooner to the children with ADHD than to the children of the control group. That can be seen in more pronounced deterioration of stableness and concentration in the end of experiment.

Fig. 3 – Dynamics of productivity changes in the Bourdon test

Fig. 2 – Dynamics of speed changes in the Toulouse-Pieron attention test

This fatigue effects mainly the attention concentration whereas the children with normative development just slow the activity and change the strategy, still keeping concentration at the same level.

Fig. 4 – Dynamics of productivity changes in the Toulouse-Pieron attention test