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Impairment of cognitive sphere among adolescents with a family history of alcoholism

Trastornos de la esfera cognitiva en adolescentes con una carga familiar de alcoholismo

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Contents

ABSTRACT:

The article shows the results of the study of alcoholization as a form of addictive behavior. Three main groups of etiological factors of alcoholism are considered. Features of social disadaptation of adolescents as a result of alcoholism are described. In conducting the study, the technique of analysis of late waves caused by the electrical response of subcortical and cortical formations of the

RESUMEN:

El artículo refleja los resultados de la investigación del alcoholismo como una forma de la conducta adictiva. Se consideran tres grupos principales de factores etiológicos del alcoholismo. Se notan las peculiaridades del descondicionamento social de adolescentes como resultado del alcoholismo. En el transcurso de la investigación se utilizó la metodología del

brain was used. As a result, the following information was revealed: people born in a family with a strong alcohol addiction have an impaired ability to identify important information in the cognitive analysis of the incoming impulses. The results are related to the inability of individuals with a family history who do not have contact with alcohol to identify significant signals; the impossibility of proper decision-making; the difficulties of differential focus. A change in the functions of recognition of information, the ability to remember, encode and compare the incoming information with the image in the intellectual sphere is observed.
Keywords: alcoholism, addiction, deviation, cognitive sphere, family history

análisis de las ondas tardías de la respuesta eléctrica provocada de las estructuras subcorticales y corticales del cerebro. Como resultado, ha sido revelado que las personas que nacieron en una familia con la aspiración intensiva a la borrachera tienen trastornos en la capacidad de extraer la información importante en un análisis cognitivo de los impulsos entrantes. El trabajo refleja los resultados relacionados con la incapacidad de las personas con carga familiar que no tenían contactos con el alcohol de distinguir las señales importantes; la imposibilidad de tomar una decisión correcta; dificultades para la atención diferenciada. Se observa un cambio de las funciones de reconocimiento de datos, de capacidad de recordar, codificar y comparar la información recibida con una imagen que se encuentra en la esfera intelectual.
Palabras clave: alcoholismo, adicción, desviación, esfera cognitiva, carga familiar

1. Introduction

Destructive behavior of a person is its destructive form of connection with the environment, changing the psychological-emotional state by means of increased use of psychotropic substances (tobacco, alcohol, drugs). Addiction is a borderline state between the norm and pathological dependence. Adolescents feel very vivid emotions, the repetition of which becomes important for them, hence it causes the dependence.

The need to get oneself noticed, to attract others, to change gray, boring manifestation of one’s emotions to more vivid one becomes the motivating force of an individual with an addictive form of conduct An adolescent is not able to implement the common types of work which enable him to retain the positive traits of character, temperament, to show his abilities by forming his own style of life, to inspire and to evoke a positive emotional response. An adolescent with destructive behavior stands out from the generally accepted behavior that brings success to an individual. He has no desire for stable activities; there is a passion for temporary success in the easy achievement of the result.

At the National Research Center of Narcology (branch) of the Federal State Budgetary Institution "National Medical Research Center of Psychiatry and Narcology n.a. V.P. Serbskiy" of the Ministry of Health of the Russian Federation conducted a study of the central nervous system disorders among people who drink alcohol, which manifested in the features of bioelectric brain activity in behavioral reactions.

The obtained results related to alcoholization as a form of addictive conduct indicate the relevance of this research area and the need to develop proposals and recommendations for reducing the number of

adolescents with destructive behavior, rehabilitation and prevention aimed at creating psychophysiological methods of correction of thinking, memory, imagination.

Despite the available research on the psychophysiological causes of the development of the symptoms of behavior dependent on alcohol abuse, it should be noted that at the present stage there are few studies of the functional changes occurring in the central nervous system.

In particular, deviant conduct, which refers to the system of actions deviating from legal, ethical, social demands which are accepted in society and necessary, may be formed among adolescents who have a family history of taking psychoactive substances. This is manifested in the form of impaired functioning of sensation, perception, and imagination, changes in self-regulation and volitional activity and inability to overcome external and internal difficulties for successful self-control of refusal of psychotropic substances.

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2. Literature Review

There are different approaches to the definition of the term "alcoholism". Revealing the causality of human alcoholism, it is necessary to consider the theoretical concepts described in a number of works of Russian scientists (Arzumanov & Sudakov, 2016; Bratus, 2012; Kondrashenko, 1988; Lichko, 2016; Pyatnitskaya & Ivanov, 2008; Sidorov, 2008; Chelysheva, 2015; Shilova, 2017). Analyzing a number of conditions and factors of alcoholism, the authors note that this contributes to the uncertainty of social conditions, changes in externally stable ways of life and often changing conditions of existence of an individual.

According to Kondrashenko (1988), alcohol abuse is the result of disease with progradient current resulting from excessive alcohol consumption and manifesting in a pathological dependence on intoxicating agents. Characteristic mental, somatic and neurological disorders accompanied by changes in social structures affecting the formation of the patient's personality appeared. Alcoholism consists of two main components: medical and social (Jackiewicz, 2011; Delucchi & Weisner, 2010; Murphy et al., 2010).

The social factor of alcoholism is a way of transmitting the social experience of alcohol consumption in the process of life. This involves a change in the spiritual world and the monetary welfare of the family, including the occurrence of the disease in the heaviest drinker (Gnezdickiy et al., 2017).

The reasons for the presence of alcoholism have a medical factor, which is caused by a pathological change in the body, which is directly related to chronic alcohol intoxication since the body is poisoned by alcohol.

It is necessary to determine the conditions of alcoholism. Currently, there are a triad of conditions which contribute to alcoholism: social, psychological and biological.

Social conditions include the status of a person in the family, in education, in economic security, profession, lifestyle, attitude to religion, as well as in a group of close friends, company. All this can predispose to the emergence of alcohol addiction. These criteria of social conditions are interrelated and must coincide for the emergence of alcoholism (Kingree & Thompson, 2011).

Psychological conditions include the premorbid features of an individual, his ability to relaxation and euphoria with the use of alcoholic beverages which give psychological comfort, facilitating interpersonal contact. According to Bratus (2012) and Sidorov (2008), the main attractive force of "craving for wine" and intoxication is the illusion that alcohol can satisfy desires and resolve conflicts that arise in society. An adolescent begins to abuse alcohol hoping to cope with intrapersonal and interpersonal conflicts, as well as this happens in an adult. The roots of alcohol addiction are determined, that is, caused by both external social conditions and internal motivation of human behavior (National Institutes of Health (NIH), 2014).

The problem of correction of alcohol addiction must be addressed both in the depths of family and school with the involvement of medical institutions and a wide range of the public.

Psychological assistance for such persons is of a systemic nature, including a personality-oriented approach with psychological support, both with alcoholics and drinking persons.

Currently, there is no clear definition of drunkenness. This is difficult because the amount of alcohol that causes intoxication is different for each individual. Speaking of drunkenness, the age of the drinker should be taken into consideration (Rondó & Felis, 2012; Spirito et al., 2011).

Many researchers giving the name of alcoholism in adolescence come to the conclusion that this definition refers to the term "early alcoholization" (Lichko, 2016).

The psychological state of comfort in the drinking process is the leading for an adolescent. Drunkenness of adolescents is self-affirmation, independence, freedom and the opposite in relation to the requirements of parents; it is opposed to social norms. The company of older drinking adolescents often becomes attractive to girls. Girls tend to drink so that no one sees them and knows that they do it.

Minors usually drink in the companies of peers. These phenomena are also described as typical of the alcoholic, psychological addiction which is accepted in the group of adolescents. Psychological addiction occurs before abstinence and leads to a long drinking which lasts many weeks.

Alcohol consumption of minors causes a vomiting reaction and it seems that it should stop them and stop taking alcohol. However, with the constant use of alcoholic beverages, there are pronounced negative distortions which quickly disappear with the continuation of drinking alcohol.

At the beginning of taking alcoholic beverages by adolescents, specific distorted forms of intoxication are observed: sometimes, instead of the sense of euphoria and physical satisfaction, taking alcohol leads to a depressed and, at the same time, to an aggressive-evil state, which leads to increased aggressiveness, illegal actions, often fatal ones – suicide, in other cases, motor activity appears, which is not controlled and leads to unpredictable conduct that looks like impulsive actions. Taking small amounts of alcohol also leads to a strong clouding of consciousness to the extent of a stupor.

Maladjustment occurs, and it happens faster than among drinking adults. When taking alcoholic beverages, an under-aged adolescent loses interest in academic activities or work. Alcoholization is often accompanied by escapes from home, vagrancy, violations of law and order.

With the further development of alcoholism in minors, before the appearance of obvious signs of chronic alcohol addiction, there are obvious violations of the cognitive sphere, neurasthenia and vascular dystonia and the accompanying crises. There are prerequisites of character accentuations. Constant drinking in adolescence leads to the development of drunkenness; it is extremely difficult to identify the state of drunkenness and alcoholism, especially if we are talking about the beginning of this disease.

Many adolescents have thoughts about stopping drinking alcohol. The motive force of stopping alcohol abuse is different. It occurs before the start of consumption, but it disappears in the process of drinking alcohol, because there appears a tolerant attitude to alcohol and the need for its use at the level of pathological addiction to alcoholic beverages.

Addiction to alcohol prevents the body's protective reaction to alcohol toxicity, which manifests itself in the form of vomiting and retarded comportment that contributes to the preservation of the body. In the initial stage, signs of alcoholism are the processes of oxidation of ethanol and immunobiological reactions of the body as a prodrome of alcoholism as a disease. This leads to psychological addiction to alcohol, habituation, palimpsests, systematic and asthenic symptocomplexes.

Pathological craving for alcohol, which arose at a certain stage of drunkenness, begins to have the character of obsessions, leads to mental addiction to alcohol and the loss of control over the amount of its consumption. Obsessions of alcoholics largely depend on situational and domestic factors (company, payday, etc.).

After the consumption of alcohol, the body's sensitivity to alcohol is reduced, there is a need to take doses exceeding the initial ones, the reaction to alcohol changes 2-3 times. Often the usual state of intoxication and euphoria includes the manifestation of symptoms of aggression, suspicion, etc. Palimpsests, which are losses of memory about the cases related to the previous state of relatively moderate intoxication, become permanent.

Along with mental addiction and changes in the reactivity to alcohol, an

important criterion for the beginning of alcoholism is an asthenic syndrome, which often occurs in adolescents as a result of chronic alcohol intoxication. It is manifested by increased irritability, unrestraint and affective reactions. During the excitation (out of intoxication state), movements of adolescents become sharp, they scream, often cry and swear. These outbreaks are short, however, they occur regularly. In different periods of time, adolescents can be both active and quickly fatigued, they can drop out of school, lose interest in learning.

Performing intellectual activities, they are almost unable to concentrate, which is characterized by distraction and poor memory. Failures in learning activities cause strong dissatisfaction with themselves and the teachers. Minors are "enraged" by ordinary stimuli to which normal people do not react. They cannot stand comments of adults.

At the first stage of the disease, the presence of emotional weakness, deterioration of mood, resentment, capriciousness and increased suspiciousness are inherent.

In the primary phase of drunkenness, asthenic syndrome is reversible under the condition of abstinence from alcohol, but this process lasts 3-4 months after stopping drunkenness. This is different from abstinence and a state of usual post-intoxication weakness, in which the asthenic syndrome resolves in 3-4 days, and from the patho-character personality development in which the signs of asthenia, as a rule, are irreversible.

With the aggravation of the disease (stage 2), the chronic addiction to alcohol becomes unrestrained and impulsive. Critical attitude to the quality of alcohol consumed, and in most cases, the control over the situation is completely lost. Abstinence syndrome is being formed. Alcohol addiction raised to the limit level, to some point remains stable for some period of time (1-2 years) and then develops a tendency to reduce it. Abstinence syndrome, an irreversible urge to alcohol, leads a drinker to alcohol addiction.

Asthenic syndrome is also changed. Lethargy, apathy, susceptibility to external retardation (hyposthenic form) begin to prevail in the clinical picture, and these characteristics increasingly become traits of character. Signs of brain damage appear. A severe lability of affects with a tendency to paroximal emerging dysphorias, reduced attention, increased mental and physical exhaustion, the difficulty of adaptation to new conditions are typical.

The basis of the formed alcoholism consists of: irreversible addiction to alcohol, loss of control over one's actions, abstinence, loss of protective reactions, distortion of tolerance, asthenic symptoms. However, these properties combined by a number of authors in the drug addict syndrome (Pyatnitskaja & Ivanov, 2008) are not the only manifestations of drunkenness, although they are unchanged. As a rule, with the development of the disease, special neurological and somatic disorders appear along with the strengthening of the drug addiction syndrome. The study of the works of scientists gave an idea of both the diversity of the

phenomenon of alcoholism, and a variety of ways to study it.

Currently there is no single theory or concept of alcoholism adopted in scientific world. Its causes, especially in minors, are still poorly studied. This to some extent explains the lack of effectiveness of measures aimed at the prevention and treatment of alcoholism.

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3. Research Methods

The study was conducted in 2017 on the basis of the Federal State Budgetary Institution "National Medical Research Center of Psychiatry and Narcology n.a. V.P. Serbskiy" of the Ministry of Health of the Russian Federation. The studied group consisted of adolescents aged 13-15 years (25 people) and young men aged 17-21 years (25 people) from families with a history of taking psychoactive substances.

The functional state of the cerebral cortex and subcortical formations was studied.

All adolescents were studying in general educational schools. Logical and thinking memory was not been violated.

In the experiment, the control group of subjects consisted of persons without a family history of addiction to taking psychoactive substances (20 people).

The study was conducted on a multifunctional computer complex Neuro-MVP of the Neurosoft company (Russia).

Late waves of auditory evoked potential (AEP) wave P600, from the central areas (C3-left and C4-right), as well as from the associative areas (A1-left and A2-right) were recorded.

Measurements were carried out using electrodes located on the left and right thorax mastoids.

During the record of AEP, stimuli were given according to the paradigm (odd-ball paradigm). The low tone signal was insignificant for the subject (concentration of attention is low), and the high tone was significant, and it should have been considered (concentration of attention is high).

The wave P600 AEP was analyzed. Peak latencies and inter-peak amplitudes were measured.

The research was conducted only after the correct understanding of the instructions.

For the analysis of the real study of the state of subcortical formations of the brain, the registration took place as follows:

• Studies were conducted on the head of the tested subject by using silver cup-type electrodes filled with conductive paste, which were attached to the ears in the area of the vertex (CZ) – active electrode, reference electrodes;

• Sound signals in the amount of two thousand were sent through headphones and upon completion of the study with the help of markers,

the average latent periods of the studied waves caused by stem auditory potentials (CSAP) were determined. III and V response waves were considered.

The results of the experiments were processed using the package of applications "Statistic 10". Since all the studied indicators corresponded to the law of normal distribution, the parameters of medium value (M) and standard deviation (S) were taken as a basis. When comparing the studied groups on these indicators, we have the right to use parametric methods. The comparison of two independent control and experimental groups on one basis was conducted by an independent samples student's t-test.

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4. Results and Discussion

Alcoholism is a disease, which is based on the development of certain psychophysiological mechanisms. According to the government statistics, the number of people using alcohol (surfactant) amounted to 2 million 406 thousand people in 2016. The number of minors taking psychoactive substances during this period amounted to 48 thousand people, which can lead to deterioration of health, to mental degradation and persistent somatical-neurological disorders.

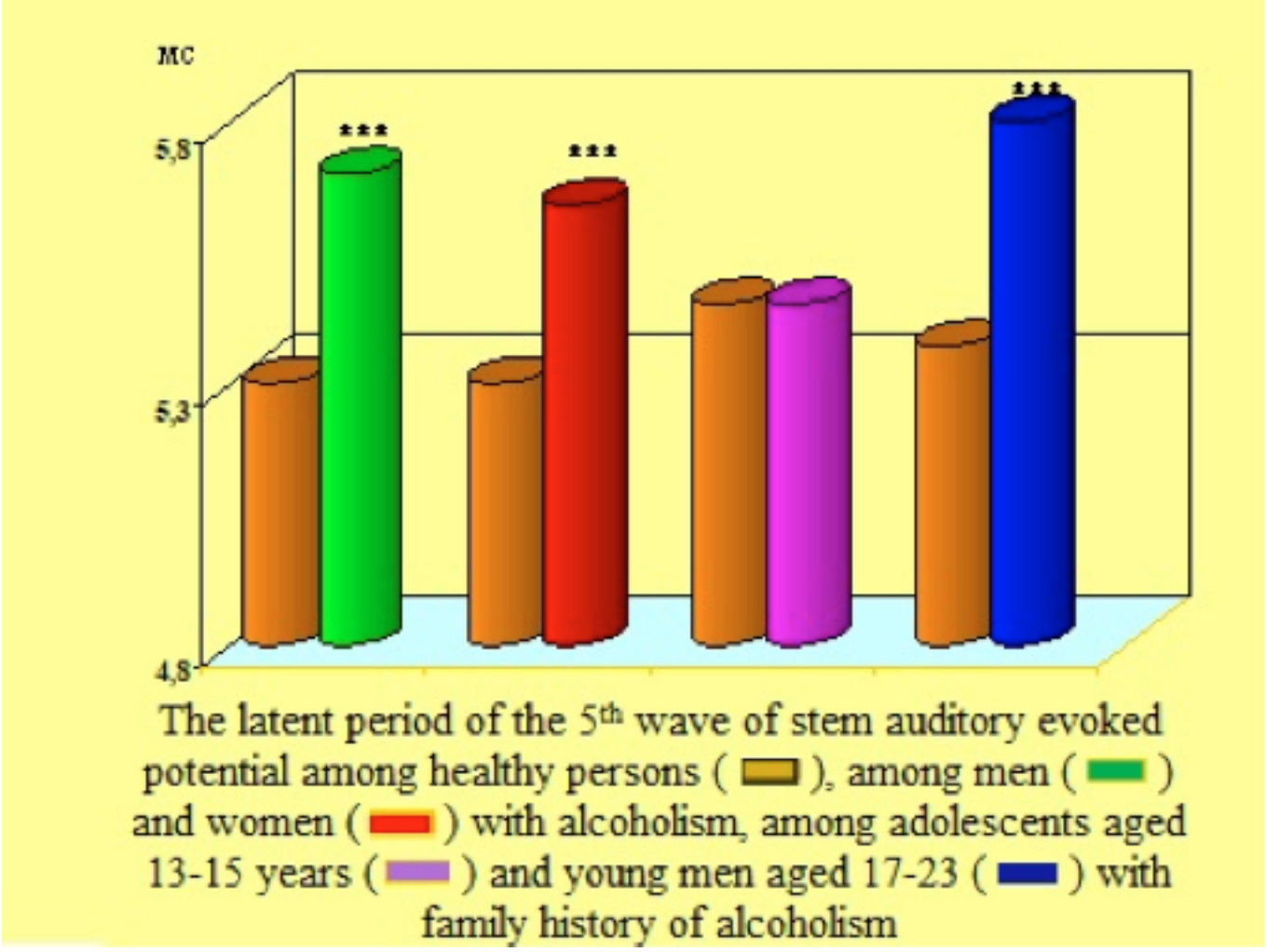
Despite the fact that a significant number of measurements on the psychophysiological mechanisms of the formation of painful symptoms and on the results of alcoholization were found, the role of functional changes occurring in the central nervous system has been little studied until recently (1,2).

Among the adolescent persons who have a family history of taking psychoactive substances, deviant comportment may be formed.

In adolescents (13-15 years) and young men (17-21 years) with hereditary history of psychoactive substances, functional changes in the central nervous system were studied by recording and subsequent analysis of the features of the electrical activity of the cortex and subcortical formations of the brain in respond to sound signals.

In adolescents aged 13-15 years, we were not able to identify functional disorders in the subcortical formations of the stem structure of the auditory pathway, regarding the subjects who do not have a family history. However, the study of minors in the context of this problem which was conducted after a while in the same subjects (aged 17-21 years) showed deterioration in the functional state of the subcortical formations of the brain, as well as in patients with alcoholism. This reflects the non-completion of the coating of the myelin sheath of the peripheral parts of the nerve fibers in the young men from disadvantaged families who do not consume alcohol (Fig.1).

Figure 1
The Latent Period of the 5th Wave
of Stem Auditory Evoked Potential



Source: the authors

The features of the induced electrical activity of the cerebral cortex in the conditions of differentiated attention based on the results of the analysis of the late positive wave of the electrical response of the cerebral cortex – the wave P600 m/sec were also studied in young men. This wave was associated with a certain level of differentiated attention of the subject.

It was shown that in persons with a family history of alcoholism, the value of the late wave is almost unchanged and at low and high concentration (Fig. 2).

Figure 2
The Study of the Features of the Electrical Activity of the Cerebral Cortex in Young Men under the Conditions of Differentiated Attention

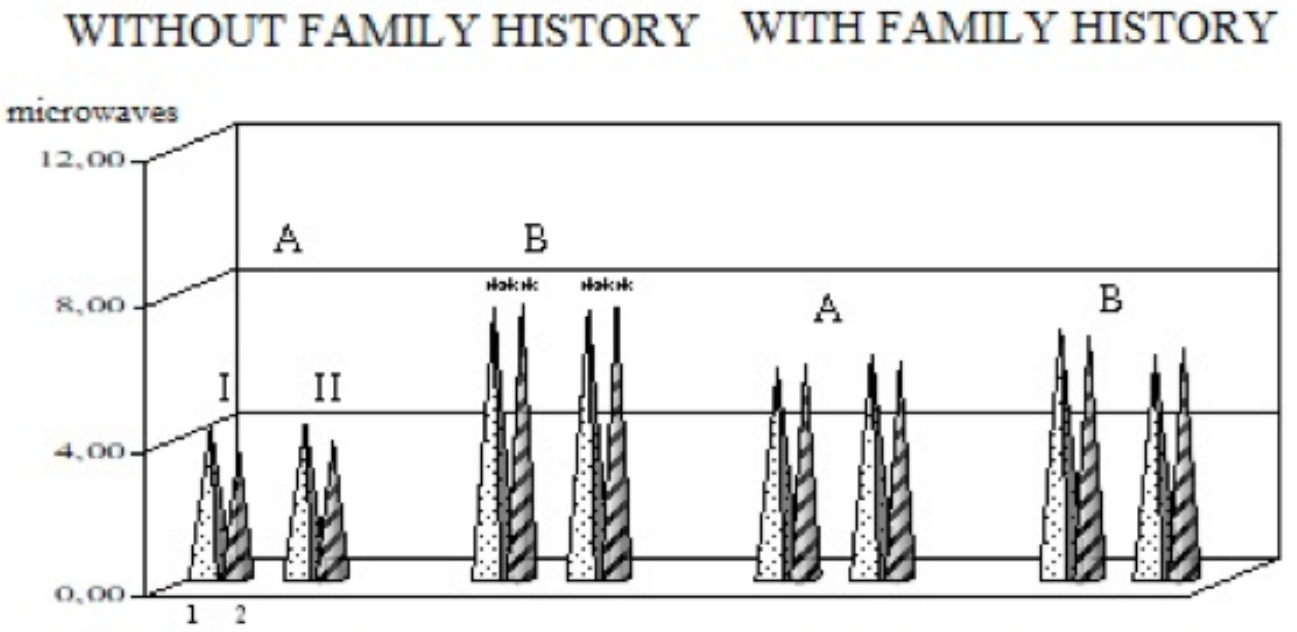


Fig.2. The amplitude of wave P600 in the subjects in the left (1) and right (2) associative (I) and central (II) areas of the cerebral cortex in response to the significant (A) and unsignificant (B) signals

Source: the authors

In young men without family history, a clear difference in the value of the late positive potential for significant and ignored stimuli was found.

It was revealed that in adolescents, in families of drinking parents, a change in the ability to find important information at the stage of the mental form of determining sounds was found.

This is stated by the absence of a difference in the late components of the response to the characteristic and uncharacteristic impulses from the sensory channels, which requires more attention.

5. Conclusion

The paper reflects the results of the study of cognitive disorders in adolescents with a family history of alcoholism, which were systematized in the context of theoretical concepts of alcoholization as a form of addictive behavior. According to the data obtained, it was revealed that adolescents living in a family of drinking parents have an impaired ability to see the main information in the cognitive analysis of incoming signals.

The study showed the need for research of psychological, psychophysiological and social characteristics among persons with family history for the preparation of the prevention program, correction and treatment of patients, which can lead to a decrease in negative manifestations of the psyche.

The work reflects the extremely important results associated with the inability of healthy people who have family history and have no contact with alcohol to identify significant signals. They have the distorted function of the difference in sensory information, violated algorithm of memorizing, encoding and matching the incoming information with the

standard kept in memory.

The undertaken research is of special significance for psychologists, medical and social workers, teachers regularly dealing with the persons having relatives with alcohol addiction. The results may provide a better understanding of destructive type of behavior by these people and demonstrate the possible mechanisms to control their behavior and actions using medical and psychological instruments.

Bibliographic references

Arzumanov, Yu.L., & Sudakov, S.K. (2016). Neurophysiological Aspects of Dependence on Psychoactive Substances. In: N.N. Ivanets, I.P. Anokhina, M.A. Vinnikova (Eds.), Narcology - National Guideline Neurophysiological Aspects of Dependence on Psychoactive Substances. Addiction – National Guideline. Moscow: Publishing house "Geotar-Media", 185-198.

Bratus, S.B. (2012). Personality Anomalies. Moscow: Publishing house "Kniga po Trebovaniyu".

Chelysheva, Yu.V. (2015). Reference Groups and Value Orientations of Adolescents of Antisocial Behaviour. *Systemic Psychology and Sociology, 16*.

Delucchi, K.L., & Weisner, C. (2010). Following Problem Drinkers Over Eleven Years. *J Stud. Alcohol, Drugs, 71*, 210-218.

Gnezdickiy, V.V., Chackaya, S.O., Liyu, A.V., & Klochkova, O. (2017). Memory, Cognition and the Endogenous Evoked Potentials of the Brain: the Estimation of the Disturbance of Cognitive Functions and Capacity of Working Memory without the Psychological Testing. *Successes of Physiological Sciences, 48*(1), 3-23.

Jackiewicz, D. (2011). Hyperpersonal Recovery from Alcoholism Negotiating Social Support and Self-Disclosure Between Computer-Mediated and Face to Face AA Meetings: PhD Thesis. Normal, IL: Illinois State University.

Kingree, J.B., & Thompson, M. (2011). Participation in Alcoholics Anonymous and Post-treatment Abstinence from Alcohol and Other Drugs. *Addictive Behavior, 36*, 882-885.

Kondrashenko, V.T. (1988). Deviant Behaviour of Adolescents. Minsk.

Lichko, A.E. (2016). Psychopathies and Types of Character Accentuation among Adolescents. Moscow.

Murphy, J.G., Dennhardt, A.A., Skidmore, J.R., Martens, M.P., & McDevitt-Murphy, M.E. (2010). Computerized Versus Motivational Interviewing Alcohol Interventions: Impact on Discrepancy, Motivation, and Drinking. *Psychology of Addictive Behavior, 24*, 628-639.

National Institutes of Health (NIH). (2014). Using Social Media to Understand and Solve the Problem of Consumption of Substances and Drug Addiction (R01). Retrieved April 15, 2019 from: http://grants.nih.gov/grants/guide/rfa-files/RFA-CA-14-008.formathtml

Pyatnitskaja, I.N., & Ivanov, V.I. (2008). General and Specific Narcology. Moscow: Publishing house "Medizina".

Rondó, J., & Felis, J. (2012). Survey: Ten Percent of American Adults Report Being in Recovery from Substance Abuse or Addiction. New York: OASAS.

Shilova, T.A. (2017). Psychology of Personality: Study Guide for Students of Higher Educational Institutions Students of the Specialty "Psychology of Personality". Moscow: Publishing house "Pero".

Sidorov, P.I. (2008). Narcological Preventology. Moscow: Publishing house "Geniy".

Spirito, A.H., Sindelar-Manning, H., Colby, S.M., Barnett, N.P., Lewander, W., Rohsenow, D., & Monti, P.M. (2011). Individual and Family Motivational Interventions for Alcohol-Positive Adolescents Treated in an Emergency Department. *Archives of Pediatrics and Adolescent Medicine, 165*(3), 269-274.

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