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Case Review

Formation of Higher Nervous Activity in Human and Autism Spectrum Disorder

Vahram R Sargsyan*

President of the International Academy of Neuroscience and Research associate L.A. Orbeli Institute of Physiology, Yerevan, Republic of Armenia

***Corresponding Author:** Vahram R Sargsyan, President of the International Academy of Neuroscience and Research associate L.A. Orbeli Institute of Physiology, Yerevan, Republic of Armenia

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Abstract

Based on the new genome classification (main and acquired genome) and the modern understanding of the formation of higher nervous activity in humans, the basic reasons for the formation of autism spectrum disorders (including autistic disorder) are given. A new method is proposed for the treatment of autism spectrum disorders - classical gene therapy.

Keywords: Autistic Disorder, Autistic Spectrum Disorder, Main Genome, Acquired Genome, Higher Nervous Activity, Classical Gene Therapy.

Autistic disorder (autistic disorder) [1] - a disorder that occurs as a result of a violation of the development of the brain and is characterized by a pronounced and comprehensive lack of social interaction and communication, as well as limited interests and repetitive actions. All these signs begin to appear at the age of three years [2]. Similar conditions, in which milder signs and symptoms are noted, are attributed to autism spectrum disorders [3].

Autism spectrum disorder (ASD) is a neuro-ontogenetic disorder, that is, a mental development disorder with onset in infancy or childhood, characterized by a persistent deficiency in the ability to start and maintain social interaction and social connections, as well as limited interests and frequently repeated behavioral actions. The main characteristic of the disorder is a permanent deficit in social communication and social interaction. The main deficits in people with autism spectrum disorder are skills coordinated with a partner in communication attention and reciprocity in interaction. Among persons with autism spectrum disorder, mental retardation is common, but there are also highly functional individuals with this disorder.

Symptoms of autism occur due to changes in various brain systems that occur during its development [4]. Despite extensive research, this process is still far from being fully understood. In the description of the mechanism of disorders can be divided into two areas: the pathophysiology of the structures and processes of the brain associated with autism, and the neurophysiological connections of structures with behavioral reactions [4]. The changed behavior can be caused by many pathophysiological factors [5]. Among the causes of the disorder are hereditary factors and the impact of the environment.

The main purpose of this scientific article was to present a new understanding of the mechanisms of formation of autism spectrum disorders (ASD), based on the latest achievements in the field of cell biology [7], neurogenetics [6] and neurophysiology [9]. We also propose our solution to this medical and social problem using the method of classical gene therapy [8].

To date, about 1,000 genes associated with this group of diseases are known. Most of them are related to brain function and proteins that affect signal pathways and gene expression. Changes in the structure of the gene affect the development of the brain. According to various sources and depending on family history, disease development depends on genetics, 64% and 91%. Until now, the exact mechanism of inheritance of ASD is not yet clear. Studies show that identical twins have a higher risk of developing the disorder than different twins, and different twins have a higher risk than their siblings. This suggests that the development of the disease affects not only genetics, but also during pregnancy. Based on our new classification of the genome into primary and acquired [6] and our understanding of the formation of higher nervous activity

in humans [9], it becomes clear that the cause of ASD is the incorrect formation of the acquired genome during ontogenesis (embryonic and postembryonic development). Below is our classification of the genome.

Main genom and acquired genome

The main genome is a set of all genes obtained by the body from the egg and sperm as a result of fertilization (nuclear, mitochondrial, plastid). It's vertical gene transfer.

Acquired genome is the set of all genes produced by the body during embryonic and post-embryonic periods by migratory organelles cells (biocommunicators) in the form of molecules of DNA and RNA. It is important to note that the acquired genome can also be formed on the basis of existing genes (biocommunicators) under the influence of, for example, electrical processes occurring in the nervous system of the body (see viral theories of perception of information, the formation of long-term memory and the functioning of the somatic nervous system). Which take place as a result of the activity of sensory systems of the body. The formation of the acquired genome is also influenced by electromagnetic radiation (for example, ultraviolet radiation spectrum) of natural and artificial origin. About this in detail see the viral theory of electromagnetoreception. In fact, it turns out that all changes occurring in the external and internal environment of the body are fixed (cause changes) in the acquired genome. Those that are important – are stored in the reserves of long-term memory of the body. It's horizontal gene transfer. The acquired genome is individual for each somatic cell.

According to the above information on the acquired and main genomes, a new definition of the term "phenotype" can be given. Phenotype is a manifestation of a set of genes obtained by vertical and horizontal channels of gene transfer and the result of their interaction. Consequently, the phenotype is the expression (manifestation) of the genotype. Naturally contribute to the combinative and mutational variability.

The body throughout life – from the moment of fertilization of the egg (the formation of the zygote) to death has the ability to enrich its genotype by increasing the proportion of the acquired genome. This is done by horizontal gene transfer. Information received by sensory systems (receptors) of the body about the external and internal environment actively affects the change (enrichment or impoverishment) of the acquired genome of the organism. As a result, the phenotype changes. However, these changes affect only the genes of certain cells of certain tissues of the body. For example, cells of the Central nervous system (CNS) of humans or animals, immune system or liver cells change. If the changes touch the germ cells, the new features and properties will be inherited from generation to generation.

According to the additional position of the cell theory, the cells of multicellular organisms are totipotent, that is, they have genetic potentials of all cells of the organism, are equivalent in genetic information, but differ from each other by different expression (work) of different genes, which leads to morphological and functional diversity – to differentiation.

The opinion of the author of this article differs from the above additional provision of the cell theory. Bearing in mind that there is an acquired genome (except for the main one) – cells in the process of ontogenesis of the organism already become not equivalent in genetic information and therefore differ from each other not only by different expression of different genes, but also by different gene set of the acquired genome. This is essential for morphological and functional diversity (differentiation) of cells. It is a necessary condition for the appearance of highly specialized cells of multicellular organisms (in humans, for example, in the process of embryonic and post-embryonic periods of ontogenesis). This feature is not taken into account by many bio-engineers in obtaining tissues and organs *in vitro* for their further use for medical purposes (transplantation of tissues and organs) and therefore can not get fully functioning and suitable for transplantation to the recipient many types of human tissues and organs. To date, more than one scientist in the world has not managed to get the human brain *in vitro,* and never will, if you do not take into account the presence of the acquired genome of the cell. Because in difficult functioning organs (for example, the brain) the key role is played by horizontal gene transfer.

If we take into account that the organism (cell) has the main and acquired genome, this fact sheds light on many, currently unresolved scientific issues and, first of all, on aspects of the genetic level of development of the organism. In turn, it becomes clear how and by what molecular mechanisms the differentiation of cells in multicellular organisms in the process of individual development (ontogenesis) is carried out. Scientifically fully justified, for example, the emergence of highly specialized functions in the neurons of the human brain and the manifestation already at the organizational level of various functions of higher nervous activity, many of which even at the present stage of human development are considered "secrets" of science.

In fact, the presence of ASD is due to the improper formation of the acquired genome and, as a consequence, the defective formation and functioning of the brain. This has led to the inferiority of the higher nervous activity of man.

To improve the quality of life of patients, we propose to carry out classical gene therapy [8] from the moment of diagnosis in children with ASD.

Classical gene therapy

Because viruses (biocommunicators) – mobile genetic elements of eukaryotic cells, they can be used to transfer the necessary characteristics and properties from one organism to another. We propose to use this opportunity in the treatment of various neurodegenerative, mental and oncological diseases. Our previous scientific article describes in detail the formation of cancer and neurodegenerative diseases [10]. These diseases are formed due to the destruction or reduction of activity of corresponding biocommunication. This leads to a violation of the signal transduction and the functioning of the energy system of the cell. If you restore the composition of biocommunication sick person with the help of the introduction of biological material from a healthy person (donor) to the patient, remove the cause of the formation of the disease. This will lead to the recovery of the patient. The use of classical gene therapy in the treatment of ASD will be very effective, since such problems are associated with the improper formation of the human nervous system and the basis is the defective formation of the acquired genome. The donor of the biological material must meet all the requirements demanded of the donors. We suggest using human saliva or cerebrospinal fluid as a donor biomaterial. There is still no data of experimental studies and clinical trials on this issue. Therefore, talking about the recommended doses is not possible. It is necessary to determine optimal and suitable donor of biological material (containing biocommunication) for the treatment of a disease. Side effects and contraindications according to assumptions based on theoretical data – almost no.

Thus, I propose to actively apply in practice the proposed in this article a practical method for the treatment of ASD and thereby improve the quality of life of millions of people around the world.

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