

CONSIDERATIONS ON THE PROBABLE NATURE OF SERUM GLOBULIN CHANGES IN SCHIZOPHRENIA

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The changes in the composition and properties of serum globulins in schizophrenic patients continue to be subjected to intense investigations. These studies could be divided conditionally into three stages: First stage — up to the time of introducing modern routine laboratory methods. A number of authors, applying mainly colloid-stability tests, often establish impairment of the albumin-globulins ratio (3, 4, 29, 30, 40). Second — after resorting to up-to-date laboratory methods such as electrophoresis (10, 11, 12, 38) and immunoelectrophoresis (9, 14, 15, 31, 32, 33, 37), data were established for the rather frequent increase of some mobility components of alpha-1, alpha-2 and particularly, β -2 globulin fractions. Third stage — consisting of investigations on some specific functions of the serum globulins — enzyme (1, 25, 26, 36) and immune (5, 6, 7, 8, 13). In the past few years, many investigators are in search of a specific toxic action of certain globulin components towards biological test-objects (2, 27, 28, 34, 35). We failed to come across literature data demonstrating a parallelism between the changes in the state of serum globulins (in immunoelectrophoresis) and schizophrenia dynamics.

Utilizing the possibilities for differential analysis of serum globulin components in immunoelectrophoresis (with simultaneous application of rabbit antisera against affected and against healthy, to the serum of affected and control from healthy), we already reported in earlier publications the results of the systematic investigation of blood sera from 224 patients with varying duration, form and course of the schizophrenic disease (22, 23, 24, 39)¹. In 102 of them, a dynamic follow-up study was carried out of the immunoelectrophoregrams during attack and remission, whilst in 61 more than one attack were recorded.

The results of the present study might be systematized in the following characteristics of the serum globulins' changes in the dynamics of schizophrenia: most frequently an increase (in number, intensity and localization of the precipitation arches during immunoelectrophoresis) of some of the globulin fractions is observed in early schizophrenic attacks, much more seldom in late attacks and practically absent in the chronically affected, particularly in duration of the psychosis exceeding 6 years. In early attacks, a pronounced reversibility is established of the changes, whereas during remission, in most of the patients normalization of the immunoelectrophoregrams

¹ A detailed description of the method, setting, statistical data and processing is submitted in the listed above personal references.

occurs. In the patients with late attacks, the changes assume the character of inertness and persist in most of the cases in remission too. A definite regularity is revealed by the immunoglobulins (beta-2A), which are increased most frequently during the first attack, especially in schizophrenia running a periodic course, and, virtually, show no changes whatsoever in late attacks and in schizophrenia with a continuous course. An inverse dependence is revealed by the components of alpha-2 globulins, which are more frequently increased in late attacks and comparatively more rarely — in early attacks, particularly in periodic schizophrenia. In strongly pronounced changes during attacks, there are greater possibilities for a way out in full value remission, and vice versa — the absence of changes in the serum globulins during the attack corresponds to a tendency for tight progress of the psychosis with flaccid, monotonous course and gradually increasing signs of personality alterations or inferior remissions. Most frequently, the increase of serum globulin fractions is observed in periodic course of the schizophrenia, more rarely — in the intermediate (transitory) form (16, 17, 21) and such an increase is virtually nil in uninterrupted (continuous) course of the psychosis. Three types of dependences are established between the psychotic symptomatology and the state of serum globulins: first — patients in whom increase (in number or intensity) is observed of the serum globulin components, inclusive of the immunoglobulins (beta-2A) in attack, and a strongly manifested tendency towards normalization of the immunoelectrophoretic picture in remission. The psychotic symptomatology is acute, often with oneiroid and affective syndromes, obscurity and unsystematized paranoid ideas. The latter dependence is most characteristic of the initial attacks of the psychosis and is met with more frequently in conditions running a periodic course. The remissions are usually complete. Second — patients in whom changes are noted, usually manifested by an increase of the alpha-2 globulin components. The changes reveal an inert characteristics and persist during the remissions. The psychotic symptomatology is most frequently paranoid with a tendency for enriching, expansion and systematization, not infrequently presenting paraphrenic pictures. The remissions are short lasting, incomplete, often running a course characterized only by disactuation of the psychotic production. Such a dependence is most frequently noted in the patients with intermediate form of development and is more frequent in the late attacks. Third — patients in whom changes in the serum globulins are not recorded. The psychotic symptomatology is scarce, the psychosis runs a monotonous course, uniformly, without remissions and with a gradual increase of the signs of permanent personality alteration.

The characteristics of the changes in the serum globulins in schizophrenia, studied in dynamics, justifies the discussion of some possible aspects of the nature of the derangements observed. We support the viewpoint of I. A. Polischuk (19) and L. I. Lando (12), according to which a biological protective response is involved, whose pathogenetic mechanisms are complex and very intricate. The following factors may play a role in producing the changes described above, namely: quantitative and qualitative derangements in the biosynthesis or break down of proteins in the organism, disorders in the distribution of plasmatic, organic and tissue proteins, changes resulting from impaired permeability of the vascular walls, dissociation of cellular and intercellular proteins in the circulatory system.

Particular importance might be assumed by the autoimmune processes (18, 20, 35). Amidst the frequently increased alpha-2 globulins, it is possible to establish the presence of tissue proteins with similar electrophoretic mobility, but with different immunochemical specificity (autoantigens), whilst the frequently noted increase of beta-2A globulins (particularly in the initial attacks) may correspond to stages of antibodies' formation against the autoantigenic components.

The characteristics presented, concerning the changes in the serum globulins in the dynamics of schizophrenia, warrants the assumption that the psychosis, running a periodic, intermediate and continuously progressing course, might depend up to a great extent on the reactivity of the organism in its interaction with the hypothetic toxic factor, with serum globulin changes being an element of its biological criteria. The presence of a considerable protective reaction, manifested by the globulin fractions' increase (of immunoglobulins inclusive), corresponds to an acute psychotic symptoms and good prognosis for recovery — complete remissions (periodic schizophrenia, initial attacks). In instances of weakened reactive abilities — changes in the serum globulins are not established, a slow, gradual development of the psychosis is observed without a tendency towards recovery — incomplete remissions (late attacks, uninterrupted course). In this respect, the study of the changes in the serum globulins might assume, apart of theoretical also a practical significance in terms of creating biological criteria for the prognosis, course, biological completeness of the remissions, activity of the psychotic process etc.

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ОТНОСИТЕЛЬНО ВОЗМОЖНОЙ ПРИРОДЫ ИЗМЕНЕНИЙ СЫВОРОТОЧНЫХ ГЛОБУЛИНОВ ПРИ ШИЗОФРЕНИИ

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РЕЗЮМЕ

Автор обобщает результаты длительных иммуноэлектрофоретических исследований сывороток крови параллельно с динамикой психотической картины на различных этапах, при различных формах течения, во время приступов и ремиссий у 244 больных шизофренией. Устанавливается значительно более часто увеличение (по числу и интенсивности) различных глобулиновых фракций (включительно и иммуноглобулиновых — бета 2А), что характерно для начальных приступов, при периодическом течении, реже при поздних приступах и при промежуточном течении, и почти не встречается у больных с большой давностью и непрерывным ходом шизофрении. Хорошая обратимость этих перемен в начальных приступах соответствует хорошей возможности для восстановления, а их инертный характер при поздних приступах — развитию и обогащению психотичной симптоматики. Обсуждается патогенетический

механизм этих перемен, который носит, по-видимому, комплексный характер и включает в себя сложные расстройства биосинтеза, распада и распределения белков органов и тканей, пермеабилитета сосудистых стенок, временную или прочную перестройку обменных функций, аутоиммунных или других иммунных процессов — проявление биологической защитной реакции, которая является следствием взаимодействия между гипотетическим этиологическим фактором и реактивностью организма. Высказывается предположение, что в большой степени тип течения (периодический, промежуточный и непрерывный) может обуславливаться этим взаимодействием, как элемент биологических критериев, о которых могут свидетельствовать данные дифференциального изучения динамики изменений сывороточных глобулинов. Последнее может оказаться ценным и в практическом отношении при оценке типа течения, прогноза, активности психотического процесса и дифференциальной диагностике.