

Vertebroneurology: formation, problems, prospects

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SUMMARY

Vertebroneurology as a branch of neurology was formed directly at the patient's bedside. Vertebral diseases of the nervous system include about 20 different nosologies. Vertebral neurology can be defined as orthopedic neurology. The article deals with the main problems of modern veterinary neurology. Ways of solving these problems are proposed.

Key words: vertebral neurology, neurology, clinic, problems, ways solutions, development prospects.

RESUME

Vertebroneurology as a part of neurology was formed directly at the sickbed. Vertebrogenic diseases of the nervous system include about 20 different nosologies. Vertebroneurology can be defined as an orthopedic neuroscience. The main problems of modern vertebroneurology are disclosed in the article, solutions are suggested.

Keywords: Vertebroneurology, neurology clinic, problems, solutions, perspectives of development.

Vertebroneurology as a clinical discipline was formed in the middle of the twentieth century. In fact, it is a branch of neurology and has emerged independently due to the high incidence of various "back pain". Almost 80% of the world's population 1–2 times in their life see a doctor for medical help on this problem. The proportion of diseases of the peripheral nervous system of vertebrogenic genesis in the overall structure of morbidity ranks third (5.8%) after acute respiratory diseases and injuries. The lion's share of them belongs to the syndromes of dystrophic lesions columna vertebrae, manifested mainly through the peripheral, less often through the central nervous system (77%). First of all, this is due to the fact that the spine is an organ of support, movement and protection,

It is the totality of the participation of the above organs and systems in

the realization of pathomorphological changes in them, which was ultimately recognized (despite numerous disagreements in the interpretation of syndromes), led to the deciphering of the concept of the spinal motion segment (VMS). According to G. Schmorl and H. Jungans (1932), the PDS consists of two adjacent vertebrae with an intervertebral disc, a capsule of joints, ligaments and muscles. We consider it reasonable to include in this definition nerve roots, fibers of the sinuvertebral nerve and plexuses. It is also important to include two adjacent ribs in the SMS on the thoracic region (Sagebiel L., 1984).

Vertebroneurology, unlike most clinical disciplines of modern medicine, was formed not in research laboratories, but directly at the patient's bedside, gradually accumulating invariable attributes of medical science: object, patient population, material, research methods, treatment, prevention and prognosis.

Noting the difficult path of the formation of a new discipline, one cannot but recall the birth of the most classical science of neurology from the depths of therapy. Scientific and technological progress, which made it possible to obtain new information about the anatomy, function, signs of damage to the nervous system, in combination with extensive theoretical research in the second half of the 19th century, contributed to the creation of scientific schools of neurology.

The founders of these schools were outstanding scientists: Charcot in France, Jackson in England, Strumpel in Germany, A.Ya. Kozhevnikov - in Russia [6]. At the end of the 19th century, pediatric neurology emerged in Austria (Z. Freud). In Russia, at the beginning of the twentieth century, the features of childhood neurology were studied by G.I. Rossolimo. Soon, the outstanding Russian neurologist V.M. Bekhterev organized neurosurgical departments in neurological clinics in St. Petersburg.

The achievements of modern science are steadily leading to the fragmentation of any science, including neurology. Indeed, today it would be impossible to achieve any noticeable success in the treatment of nervous diseases without neuroangiology, neuropeptidology, neuroimmunology, etc. The emergence of neuroimaging methods such as computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET), etc., contributed to a significant expansion of the base of evidence-based medicine with a high degree of verification of the pathological process, as well as the development of adequate methods of therapy. Consequently, the separation of vertebral neurology from neurology is a dictate of the times and is associated, first of all, with the widespread prevalence of vertebrogenic diseases of the nervous system (VNS), their social, economic, and medico-biological significance.

The concept of VZNS includes more than 1.5-2 dozen different nosologies [1, 3, 4, 5, 7]. Moreover, if neurology studies mainly neurological syndromes (so-called radicular, compression, etc.), then the task of vertebral neurology is to study them with secondary biomechanical disorders from the musculoskeletal system, musculo-ligamentous-capsular and, in particular, fascial structures. Without a cumulative assessment of the cause-and-effect relationships of patho- and sanogenesis, it is impossible to develop more or less effective models

rehabilitation and readaptation of patients.

According to the definition of the domestic founder of the theory and practice of the new discipline, Professor Ya.Yu. Popelyansky: "Vertebroneurology is the science of clinical manifestations of functional and organic lesions of the peripheral and central parts of the nervous system in diseases of the spine or other structures of the musculoskeletal system" [10].

In other words, the recognition of the role of neural mechanisms in the violation of the biomechanics of the spine and the musculoskeletal system in general defines vertebral neurology as orthopedic neurology.

Yakov Yuryevich Popelyansky is not only the "father" and "patriarch" of vertebral neurology, but also a steadfast, fierce defender of it throughout his long, difficult, fruitful life. Shortly before his death, he wrote to the author of these lines from Seattle (USA) a kind of testament and admonition - to fight against attempts to vulgarize the new science as "Lysenkoism" in genetics in the 50s of the last century. He brought up a brilliant galaxy of students, starting his scientific activity in Moldova (Chisinau), continued it in Kazakhstan and, especially fruitfully, in Kazan. Many of his students became famous scientists (O. G. Kogan, V. P. Veselovsky, I. R. Schmidt, G. A. Ivanichev, A. M. Prokhorsky, L. A. Kadyrova and many others). The followers of his teachings are engaged in further study of VZNS in the USA, Israel, Germany, Ukraine, Belarus and other countries. On the initiative of Ya.Yu. Popelyansky, the All-Russian Vertebro-neurological Center of the Ministry of Health of Russia was created in Kazan. In many cities, specialized departments of vertebral neurology, departments and courses have been created. The first in the USSR department of vertebral neurology with a course of manual medicine was organized in 1989 in the city of Kislovodsk in the North Caucasus (professor A.A.Liev). The creative development of the new direction culminated in the opening of the clinic of vertebral neurology at the above-mentioned department, in which more than 28,400 patients received specialized, including neurosurgical, assistance for ten years. The clinic is equipped with modern diagnostic equipment (MRI, CT, USDG, X-ray, angio-rheo-vasography, etc.). Surgeries are performed to remove intervertebral hernias, stabilize the spine with anterior and posterior approaches, as well as vertebroplasty and nucleoplasty using the cold plasma method. Branches of the clinic are open at Belgorod State University, Chisinau State University. The department conducts field training courses in many large regional and republican centers of Russia and the CIS countries.

Problems of vertebroneurology

In each new direction of science and related research, sooner or later, certain problems arise. Apparently, this process is inevitable from a philosophical point of view - the stem denies the root, the spike denies the stem, etc., that is, the new either denies the old, or comes into conflict with it. There are a great many examples of this in the course of the development of human society.

But can such a situation be called a crisis? That is how I put it

question one of the outstanding students of Ya.Yu. Popelyansky professor V.P. Veselovsky, who in the 1970s headed the country's first course of vertebral neurology at the Department of Nervous Diseases of the Kazan GIDUV, in his work "Crisis in vertebral neurology and ways to overcome it" [2].

According to the author, there were six contradictions in vertebro-neurology at that time.

The first is the lack of parallelism between the severity of clinical manifestations and radiological changes in degenerative lesions of the spine. It is known that the more pronounced the X-ray signs of osteochondrosis of the spine, the less significant its clinical manifestations, and, conversely, in the case of acute pain syndromes, minimal X-ray data are revealed. This situation has led many researchers to abandon the concept of osteochondrosis as a disease altogether. In vertebral neurology, all the main provisions were developed on the model of osteochondrosis of the spine, and if there is no osteochondrosis as a disease, then there is no vertebral neurology. Some colleagues come to this conclusion.

The second contradiction is the absence of direct neuronal connections between the lesion in the spine and some vertebral neurological syndromes. In vertebral neurology, there are mainly three factors of pathogenesis: dysfixation, compression and reflex. These mechanisms of damage explain the formation of radicular, vertebral, neurovascular and muscle syndromes. However, these mechanisms cannot explain why a patient with pathology of the lumbar spine develops cervicalgia and forms a humeral-scapular periarthrosis or often manifests vertebral artery syndrome. A number of researchers have attempted to explain the development of these syndromes by the presence of associative connections between autonomic ganglia at different levels. The second explanation for this phenomenon is

Experiments by JH Kellegren [11] with the introduction of 6% sodium chloride solution into the muscle perimisia showed only general patterns of pain propagation in the distal and proximal directions, located through several segments of the spinal cord from the injection site. JH Kellegren and his followers believed that reflected pain is transmitted through the peripheral nerves of the stimulated segment into a "common path" of the central nervous system, which allows it to simultaneously cover several segments of the spinal cord. Some authors explained the phenomenon of reflected pain by the reflex nature of pain irradiation (Kogan O.G., 1987; Antonov I.P., 1990; Armstrong RB 1984; Andres KH, During M. 1985, etc.). Later, the reflected pain from the trigger point, spreading in strict accordance with the specificity of each muscle, was called the "pain pattern" [14].

This interpretation of the clinical manifestations of VZNS led to the fact that these syndromes began to be considered separately, without connection with the pathology of the spine, and served as the basis for the development of various monotherapeutic methods of influencing the pathological process, which

also do not always achieve the desired result.

The third contradiction is the identification of active trigger zones (TZ and TT) outside the stage of stimulation of the receptors of the sinuvertebral nerve, as well as in extravertebral structures that are not innervationally connected with the lesion focus in the spine directly. However, when describing the pain pattern of TT in individual muscles and muscle groups, most authors leave aside the most common morphological tissue in a living organism - fascial structures, which have been most fully studied from a surgical point of view (Kovanov V.V., 1975, etc.). Some authors note the presence of other "non-painful" patterns. These include autonomic responses to stimulation of TT - vasomotor, secretory, pilomotor reactions, a decrease in electrocutaneous resistance, visual, cochlear-vestibular and other disorders (Atkinson JH, Ancoli-Israel S., Sleater MA et al., 1988;

In clinical medicine in recent decades, a special direction has emerged - myopathological, which began to consider muscle pathology as the root cause of suffering with a multifactorial genesis. This led to the fact that all muscular extravertebral syndromes began to be considered without regard to the pathology of the spine. The main argument in favor of this interpretation is that myofascial pain syndromes can occur both during remission and during an exacerbation of diseases of the spine, and, therefore, these are two independently coexisting pathologies. From these positions, methods of treatment are also being developed, which, as a rule, achieve a short-term effect or do not achieve it.

The fourth contradiction is the development of so-called vertebral dysfunctions, functional "blocks" located outside the affected PDS in patients with organic pathology of the spine. Meanwhile, functional disorders of the spine are found both in persons with organic pathology of the spine, and without it. All this gave rise to such prominent scientists as K. Levit, G. Wolf and others to believe that functional disorders are primary, that they dominate over organic ones and are practically not associated with them [12]. As a result, dystrophic pathology of the spine is usually not clinically relevant. This point of view gave impetus to the widespread use of manual therapy in persons with spinal pathology, which is not always justified and can lead to numerous complications and aggravation of the course of VNS.

The fifth contradiction is that it is known that the condition of patients with a compression mechanism of the development of the disease improves upon prescribing traction treatment, while the hernial disc formation in the corresponding PDS remains in place [7, 9].

The sixth contradiction is that under conditions of organic fixation (spondylosis), soreness of the SMS structures is revealed, which disappears with a change in body position, which also cannot be explained from the standpoint of only interactions between the affected disc and the receptors of the sinuvertebral nerve.

Thus, the results obtained in recent decades

studies led to the isolation from vertebroneurology of over half of all syndromes (muscle, myofascial, ligamentous-articular, neuropathies, plexopathies), as unrelated to it, and diseases such as osteochondrosis, spondyloarthrosis as clinically insignificant. These studies have shown that compression and reflex theories alone cannot explain all clinical data and treatment outcomes.

In addition to the above six points of controversy, V.P. Veselovsky also identifies other epistemological roots of the crisis in vertebral neurology: heuristic, semantic and metaphysical.

Heuristic roots are due to the fact that dystrophic pathology of the spine was discovered and described by a morphologist, not a clinician. Morphologist Schmorl on a huge autopsy material (more than 20 thousand) revealed dystrophic changes in the PDS and did not find signs of root inflammation. Depending on the localization of the dystrophic process, he identified osteochondrosis, spondylodystrophy and spondyloarthrosis. In doing so, he used a descriptive quantitative principle, comparing the degree of deviation from the so-called norm. Everything that differed from the norm, he attributed to the pathology of the PDS. Thus, fibrosis of the discs, exostosis of the vertebral bodies, compaction of the endplates, sclerosis of the adjacent segments of the vertebral bodies, a decrease in the height of the discs, etc. were attributed to the pronounced signs of osteochondrosis of the spine. However, it is known that that with a dystrophic process in the intervertebral disc, the main motor function in the affected SMS is disturbed, therefore the body "turns off" this segment. First, its fixation is muscular, and then organic. For organic fixation, the development of disc fibrosis is necessary. To increase the area of contact of the vertebral bodies in the affected facet joint (DS), exostoses of the corners of the vertebral bodies in contact with the affected disc develop. Thickening and compaction of the endplates, sclerosis of the adjacent segments of the vertebral bodies contribute to stabilization in the affected SMS. The decrease in disc height is due to two factors: loss of hydrophilicity of the nucleus pulposus and increased organic fixation. The deposition of calcium salts in the area of the fibrous tissue of the disc serves the same purpose. Thus,

Subsequently, X-ray signs of osteochondrosis of the spine were identified (Tager, Mazo, etc.), which in fact are indicators of the severity of sanogenetic reactions. Therefore, they do not find parallelism between the severity of the clinical manifestations of osteochondrosis of the spine and X-ray data, which in turn leads to the denial of osteochondrosis as a disease.

The semantic roots of the crisis in vertebral neurology lie in the fact that terms are used that do not correspond to the essence of the disease. So, for example, the term osteochondrosis literally means cartilage ossification, i.e. the disease got its name from the final adaptive reparative reaction - organic fixation in the affected PDS. The term spondylosis is also used to refer to a disease. However, spondylosis is

an X-ray anatomical concept, and it should be used to denote compensatory-adaptive reparative reactions developing in the body of patients with pathology of the disc and intervertebral joints.

The semantic roots of the crisis also include the use of certain terms without specification: trigger point, myofascial syndrome, muscle hypertonicity, vertebral dysfunction, etc. The lack of concretization in terminology leads to its separation from the pathogenetic situation and gives the appearance of the independence of the existence of individual syndromes (interscapular pain syndrome, etc.) in isolation from their vertebro-neurological essence.

All clinical manifestations of vertebro-neurological syndromes are associated only with the lesion focus in the PDS. If neuronal, vertebral, muscular and neurovascular syndromes are associated with a lesion focus in the spine due to compression and reflex pathogenetic reactions, then the same cannot be said about dystrophic lesions of the musculoskeletal system - periarthrosis of the shoulder scapula, epicondylosis, coxo-periarthrosis, ilio-lumbar periostosis, as well as neuronal lesions such as neuropathies and plexopathies, vasopathy. From the standpoint of the predominance of the local factor, it is impossible to explain the changes in the biomechanics of the musculoskeletal system far from the lesion focus in the PDS, as well as the occurrence of TZ and TT. The author attributes such judgments to the metaphysical roots of the crisis in vertebral neurology.

In conclusion V.P. Veselovsky proposed, in order to overcome the crisis in vertebral neurology, first of all, to eliminate its epistemological roots. While arguing that it is much more difficult to overcome the metaphysical roots of the problem.

To overcome the above contradictions, it is necessary to create a scientific concept that would make it possible to explain them using the prevailing vertebro-neurological views. In our opinion, all of the above contradictions can be explained from the standpoint of the interaction of the local and the general. By local, we mean pathogenetic reactions that occur in the lesion focus, and by general, we mean the response of various body systems to pathology, i.e. sanogenetic reactions. It should be borne in mind that sanogenetic reactions can be adequate and inadequate. With inadequate reactions, various complications can arise.

Solutions and prospects for the development of vertebro-neurology
The long-term experience of our clinic and department has revealed a number of equally important problems in vertebral neurology: conceptual, organizational, methodological and didactic.

First, it is necessary to conduct examination and complex treatment of patients with VZNS in specialized clinics, organized according to the territorial principle at the rate of 100 beds per 3-3.5 million of the population. To completely disavow the myth about the effectiveness of monotherapy exclusively for all forms, stages and complications of VZNS (acupuncture, manual therapy, pelloid therapy, traction therapy, etc.).

Secondly, a thorough examination of patients with VZNS is necessary. We consider MRI to be the "gold standard", which is the most informative method of modern neuroimaging methods. This is confirmed by the fact that out of 16002 patients with "back pain" examined in our clinic in 2007-2008, 906 cases of tumors of various localization were detected: in the thoracic region 99 (10.9%), in the cervical region 37 (4.08%). The largest number of cases of oncopathology was found in the lumbar spine - 146 (16.1%). The number of primary tumors in all parts of the spine was 110 (12.1%). Spinal metastases from other organs accounted for 87.8%. These data differ from the literary sources of recent years, according to which the share of metastases in the spine accounts for 96%, and primary tumors of the spine make up only 4%.

Thirdly, it is necessary to apply an integrated approach to the rehabilitation treatment and rehabilitation of vertebro-neurological patients, taking into account all neural and pathobiomechanical manifestations of VZNS, i.e. taking into account what constitutes the basis of vertebral neurology as a science.

Fourthly, the treatment of patients with VZNS must be carried out in specialized clinics equipped with modern diagnostic equipment, appropriate treatment and rehabilitation facilities and qualified specialists in the field of vertebral neurology, manual medicine and related specialties.

Fifth, when developing a comprehensive treatment program, it is necessary to take into account the stage of the disease (manifest, relapse, complete or incomplete remission) and observe the stages in the appointment of procedures: polyclinic - hospital - specialized clinic - rehabilitation center without mechanical transfer of individual techniques.

And, finally, it is necessary to enter into the register of medical specialties the specialty of a vertebro-neurologist and a rehabilitologist who knows the diagnostic techniques of manual therapy, restorative medicine, exercise therapy, acupuncture, etc.

In-depth training of specialists in the field of vertebral neurology should be carried out only at the specialized departments of medical universities, staffed by qualified specialists according to the part-time program we proposed, developed and used at our department for 20 years, approved by the decision of the board of the USSR Ministry of Health in 1989. It is necessary to consider the presence of an appropriate clinical base.

Thus, vertebral neurology, despite its "young age" and accumulated problems, has excellent prospects for further development as a branch of classical neurology and ample opportunities for a significant reduction in the period of temporary disability and the associated economic damage for production and employers at all levels.

The choice of the optimal methodological approach to the rehabilitation of this category of patients will allow, among other things, to reduce the level of disability among patients suffering from various nosological forms of VZNS.

Literature

1. Vasilevskaya L.A. Pathomorphological manifestations of prolonged muscle hypertonia in vertebrogenic diseases of the peripheral nervous system // Peripheral nervous system: collection of scientific papers. - Minsk: Science and technology, 1992. - issue. 14. - P. 34.
2. Veselovsky V.P. The crisis in vertebral neurology and ways to overcome it. - Kazan, 1993.
3. Veselovsky V.P., Liev A.A., Khafizov R.T. Clinic and treatment of thoracic Musculo-dystrophic syndromes of osteochondrosis of the spine: Methodical recommendations. - M., 1989. -- 24 p.
4. Zaslavsky E.S. Painful muscle-tonic and muscular-dystrophic syndromes (review) // Clinical medicine. - 1976. - T 5. - S. 7-13.
5. Ivanichev G.A., Liev A.A., Reichert L.I., "Neurophysiological preconditions for the combination of manual therapy and acupuncture in the treatment of painful muscle syndromes. - M.: MMI, 1990. - S. 18-24.
6. Karlov V.A. Neurology (a guide for doctors). - M., 1999
7. Liev A.A. Manual therapy of myofascial pain syndromes. - Dnepropetrovsk, 1993.
8. Liev A.A. Variants and forms of vertebrogenic myofascial lumboischialgic syndromes (Clinical-anatomical and experimental substantiation). Abstract of the thesis. diss. for the degree of Doctor of Medical Sciences. - Kazan, 1995
9. Liev A.A., Tatyanchenko V.K. Clinical and anatomical atlas of manual medicine. - Petropavlovsk-Kamchatsky, 1995.
10. Popelyansky Ya.Yu. Orthopedic neurology "(Vertebroneurology). A guide for doctors. - M., 2003.
11. Kellgren JH On the distribution of pain arising from deep somatis structures with charts of segmentals pain areas. Clin cic. Sci. 1938 v. 4 no. 1 pp. 35-46.
12. Lewit K. Management of muscular pain associated with articular disfunction. Raven Press. - New York. - 1990. - P. 315-325.
13. Travell JG Chronic miofascial pain syndromes: mysteries of the history. Miofascial pain and fibromialgia. - 1990. - V. 17. - P. 123-134.
14. Travell JG, Simons DG Miofascial pain and dysfunction, the trigger points manual. - Baltimore: Williams and Wilkins. - 1983. -- 537 p.

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Liev, A.A. Vertebro-neurology: formation, problems, prospects / A.A. Liev // Traditional medicine. - 2012. - No. 3 (30). - S.28-33.

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