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Activitas Nervosa Superior (ANS) – journal of the higher nervous activity – was founded as an interdisciplinary journal of the Czechoslovak Medical Society J. E. Purkyne in 1959 and became an official organ of the Collegium Internationale Activitatis Nervosae Superioris (CIANS) – International Association of the Higher Nervous Activity – in 1975. In Europe, the ANS has been the oldest journal devoted to the study of the higher brain functions as mechanism of cognition, regulation of somatic functions, and behavior. The CIANS, association for integrative nervous functions, neurobiology of behavior, and psychosomatics, founded in 1960 has belonged to the oldest international societies in the field of cognitive neurosciences.

Half a century ago, at ANS foundation, the purpose of the journal was to offer space for publication of experimental and clinical studies based on Pavlovian concept of the higher nervous activity. Mechanism of conditioned reflex elaboration and principles of its functioning were considered by Pavlov for a universal mechanism of brain regulation of visceral functions and behavior - named by him as “the first signal system”. This concept was accomplished later by the addition of the “second signal system” under which the substitution of perceived sensory stimuli by words was understood. This system was proposed for the brain mechanism of language acquisition and symbolic thought.

The above approach to study mechanisms of the brain functioning dominated in the experimental research of this field in the first half of the last century, when methods of a direct study of nervous processes in brain did not exist. At the beginning of the second half of century, electrophysiological and other methods were developed, which enabled to study neural processes in animal and human brain directly, and with respect to different mental processes and states.

A relatively simple concept of the higher nervous activity was successively substituted by more complex concepts of the higher brain processes and functions, which have been developed into a broad multidisciplinary field of the cognitive neurosciences. These have involved many aspects of not only biological but also of psychological and social sciences, as well as several discoveries in the fields of physics and chemistry.

These changes were reflected also in the concept and contents of ANS. In the year 1991, the title of ANS was changed to “Homeostasis in Health and Disease”, which was devoted to the studies of integrative brain functions with respect to the homeostasis of functions in the animal and human organisms, their adaptation to environmental and psychosocial conditions, and underlying mechanisms ranging from molecular to systemic processes and behavior.

It might be said, as a certain analogy to the evolution and development in nature that the field of cognitive neurosciences has not only developed in its methods of research, but also evolved in its theoretical concepts and interpretations of results. Concepts, methods, and results of research in particular aspects of the brain functioning have resulted in certain mosaics of several possible interpretations, which have required either to be verified or falsified by a further research. This process might be considered as a basis of evolution of human cognition and of understanding of how the nature, the brain, and the human society work. There is little doubt that all these questions imply also the problem of homeostasis, but one that considerably exceeds the problem of life processes in particular living organisms with respect to their health and its disorders.

The cognitive neurosciences have changed from biological to interdisciplinary, multidisciplinary, and transdisciplinary fields and from not only analytical to synthesizing also.

Reflections on the development and evolution of the higher brain functions research, and of cognitive neurosciences respectively, evoke the question of the role of ANS in this multidisciplinary area. With respect to its tradition and orientation of the CIANS, it might probably be most favorable for the journal to continue in its contemporary orientation. That is, in publication of theoretical, experimental and clinical studies in the field of the higher brain processes and functions from the point of view of cognition, interaction of animals and man with the environment, and psychosomatic relations, taking into account various aspects of health and disease.

Approaching the 50th anniversary of existence of the journal may be a suitable occasion to congratulate the ANS for its return to its original title and wish the new editor a successful continuation in its way.

Vladislav Zikmund
ANS editorial board
Physical activity is a very important part of the health lifestyle and a preventive means of the civilization illnesses. However, it may be used as an effective supplementary means in complex treatment of many diseases as well.

Glaucoma - is a group of illnesses that are often (but not always) accompanied by an increased intraocular pressure (IOP) caused by worse intraocular liquid outflow - represents an asymptomatic, progressive optic neuropathy characterized by acquired loss of retinal ganglion cells and atrophy of optic nerve. The loss of nerve fibers causes a permanently decreased visual field.

Besides the traditional therapy of glaucoma with topical drugs, the alternative practices, such as megavitamin and herbal therapy, meditation, acupuncture, homeopathic remedies and exercise are used by glaucoma patients. Aerobic exercise is known to lower intraocular pressure (IOP) which protects retinal ganglion cells. Based on a review of the literature no available topical drugs provide neuroprotection or have an effect on ocular blood flow to the retinal cells and so the aerobic exercise may be used as an effective supplementary means in complex treatment of glaucoma.

Psychical stress is an important psychosomatic parameter and a risk factor in pathogenesis of many illnesses. It is known that the hard psychical stress may increase the IOP (Flammer 2003). The unfavorable outlook to the future, the menace of the gradual worsening (even lost) of the sight may alter the patients psychical state. Physical activity may play an important role in reducing the stress and improving the psychical state and the parameters of the glaucoma (IOP and visual field) as well.

Therefore we supposed besides the beneficial effect of aerobic exercises on the parameters of glaucoma the improvement of the psychical state as well.

OBJECTIVES of the study was to assess the role of the physical activity in therapy of glaucoma - to find out the effect of aerobic exercise on visual field, intraocular pressure and the psychical state.

TASKS:
1. To evaluate the short-term effect of the aerobic exercises on IOP - to find out the differences between the levels of IOP before and after exercise session.
2. To compare the input and output levels of parameters of visual field (mean sensitivity and mean difference).
3. To find out the trend of the IOP in the exercise program period.
4. To find out the changes in psychical state due to 3-month training

SUBJECTS
Target group (A) Control group (B)
Subjects 8 female patients 7 female patients
Dg open angle open angle glaucoma
Age (years) 49,4 + 2,2 48,9 + 2,3
Exercise program
Frequency 3-times a week
Duration of the session 45 min
Period 8 weeks
Medication nonspecific beta- blocker, prostaglandin analog drops

METHODS:
Exercise program:
The classes combined both the aerobic and strength phase as well (Body Form Aerobics 2x and Fit ball Aerobics 1x per week). During each session the standard structure was kept: Warm – up. 10 to 15 minutes low impact aerobics followed by pre – stretching. Main aerobics part: 20 – to 30 minutes of aerobics movements done continuously or in intervals within aerobic training zones of individuals (50 – 85% HRmax.). Cool down: 5 minutes of slow relaxation, mostly with stretches for the particular muscle groups.

Fig. 1  Intraocular pressure before and after the exercise

Perimetry:
Quantification of the defects in visual field was evaluated by using the Octopus glaucoma program. Intraocular P
Resistance to Peer Influence and the Adolescent Brain

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Adolescents differ in their sensitivity to peer pressure, and their ability to resist peer influences; the latter trait can be assessed with a self-report questionnaire designed to minimize socially desirable responding (Steinberg and Monahan 2007). Which neural systems – if any – are engaged differentially in children or adolescents who differ in their resistance to peer influences?

We have asked this question by examining neural activity in the following three systems. First, the action-observation (or “bottom-up”) network is considered by many to represent the neural substrate of imitation; it consists of frontal and parietal regions involved in the preparation and execution of actions (Rizzolatti and Craighero, 2004). Second, the biological-motion processing network plays an important role in extracting socially relevant cues, such as those imparted by the movements of eyes or hands; neurons within the STS respond selectively to the presentation of dynamic bodies, body parts or faces (Allison et al. 2000). Third, the executive (or “top-down”) network supports a number of cognitive processes underlying decision making, working memory and the suppression of alternative programs interfering with planned actions; it consists of a set of regions in the lateral and medial prefrontal cortex (Petrides 2005, Paus 2001). Whether or not an adolescent follows the goals set by peers or those set by himself/herself might depend on the interplay between the above three neural systems, namely the fronto-parietal network (bottom-up imitation of actions), the STS network (social cues) and the PFC network (top-down regulation of actions).

To answer our question, we asked 10-year old children to watch brief video-clips containing face or hand/arm actions, executed in neutral or angry way, while measuring changes in fMRI signal. Outside of the scanner, we administered the RPI questionnaire. We found that the children with high vs. low RPI scores showed stronger inter-regional correlations (i.e. functional connectivity) in brain activity across the three networks while watching angry hand-actions (Grosbras et al. 2007). The pattern of inter-regional correlations identified by this method included both (i) regions involved in action observation: the fronto-parietal as well as temporo-occipital systems and (ii) regions in the prefrontal cortex.

Given the evidence for experience-driven structural plasticity, is it possible that adolescents with high vs. low resistance to peer influence differ not only in the degree of functional connectivity, as described above, but also in some morphological features? This might be the case for two very different reasons: (1) Early developmental events; and (2) A repeated functional engagement of a given neural system. Although we cannot differentiate between the two scenarios, here we make an assumption that individuals who differ in their resistance to peer influence also differ in the probability of engaging, in real life, the above “observation-execution” network; over time, such a repeated and coordinated engagement would translate into structural changes. We have examined this possibility in a large sample of healthy adolescents (n=295, 12 to 18 years of age) and found that inter-regional correlations in