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SCIENTIFIC CONFERENCE ON THE REGULATION
OF INFLAMMATORY AND REGENERATIVE PROCESSES

-USSR-

By V. B. Leontev

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The following is the translation of the article, "Nauchnaya konferentsiya po probleme regulyatsii vospalitel'nykh i regenerativnykh protsessov," by V. B. Levas in Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya (Pathological Physiology and Experimental Therapy), Vol. IV, No. 3, Moscow, May/June 1960, pages 83-84.

From 24 to 27 November 1959, a Conference was held in Leningrad on the problem of controlling the inflammatory and regenerative processes. At the Conference much new data were brought out on the pathogenesis of inflammation, the morphological changes in the inflammatory seat, and the connections between inflammation and cancer. Most of the reports concerned the clinical and experimental value of drugs which aid regeneration and influence the various aspects of the inflammatory process.

In his report, M. Ye. Alpern showed that an important role in the regulation of inflammation is played by the neuro-humoral factor. He reported on the study of the ultimate biochemical mechanism which permitted a significant expansion of the ideas about the pathogenesis of inflammation, and on the methods of its rational therapy. In the early stages of inflammation, the mediator balance is disturbed along with the neuro-vascular response. At the outset sympathin is produced, then acetylcholine, and at the same time the activity of cholinesterases changes. In addition to these substances great significance is attributed to histamine, active polypeptides, albumin, several enzymes, serotonin, etc. A large role in the stimulation of the protective physiological processes is played by the derivatives of nucleic acid and substances of the adenyli

system which raise the permeability of vessel walls, strengthen margination and proliferation and the emigration of the leucocytes and phagocytes. In the report of A. V. Zakharova and L. P. Tyurlikova, they brought out interesting data on the effect of ATP on the reparatory process in muscular tissue. It was noted that there was a lowering of the amount of ATP in the traumatized muscle, and a positive effect on the growth and formation of muscle tissue elements when ATP was injected. In the work of T. M. Kovalenko, the reparative regeneration of muscle tissue was studied under the conditions of an injection of live throidin and vitamin B₁₂. This also raised the reactivity of muscle tissue.

A number of reports were devoted to an explanation of the role of nervous effects on the origin and course of inflammation.

It was shown that the nervous mechanism plays a definite role in the stimulation of general protective responses. A deep necrosis and various types of denervation at the seat of the inflammation make the origin and course of the inflammatory process worse, while a medically induced sleep and novocaine blockade make it better (L. R. Petrov and V. B. Lemus). The injection of novocaine into the vascular channel lessens toxic edema in the lungs (B. G. Sidikov), and in addition gives good results in curing several inflammatory skin diseases (P. V. Kozhevnikov and N. V. Bel'skiy). In the work of V. A. Bashinskaya, on the basis of her experiments, supported the view of D. G. Rokhlin about the great importance of vascular spasms in the pathogenesis of osteomyelitis. A curative and prophylactic effect was achieved with the aid of ganglion blocking substances (hexone chloride, dyphacil hydrochloride and others).

Zh. I. Abramova in her report systematized and critically analyzed the material in print on the effect of the glands of internal secretion on the basic processes of acute inflammation. She spoke on the following: 1) the significance of specific and nonspecific responses in the presence of inflammation; 2) on the role of the hormone group in the development of inflammation; and, 3) on the expediency of simultaneous administration of antiphlogistic hormones and antibiotics.

S. M. Bakman supported the possibility of using eosinophilic tests as indicators of a reaction of stress, and he noticed that under conditions of inflammation in rats, the degree of lowering in the eosinophilic level coincided in general with a diminution of the ascorbic acid level in the tissue of the adrenaline glands. D. Ye.

Alpern presented data on the hormone action of the posterior lobe of the pituitary on the secretion of ACTH in the anterior lobe of the gland. I. R. Petrov and V. B. Lemus, in their report, gave data on the participation of the nervous and humoral mechanisms in the stimulation of the activity of the pituitary-adrenal axis in the presence of inflammation.

Of interest was a report on a new direction in the use of anti-inflammatory hormones; they are a combination of substances which strengthen proliferation under the conditions of inflammation (I. P. Grekh, N. N. Samoylov and others). From a number of these substances the most interesting are the pyrimidine products (metacil, pantoxy^l cytosine, uracil, thymine and others). The synthesis of these substances and their experimental testing was begun 13 years ago on the suggestion of N. V. Lazarev. It was suggested that due to the structural closeness of the pyrimidine products to nucleic acids, they should, as do the nucleic acids, permit a more rapid formation of the albumin molecule, speed up the growth of tissue and healing in the inflammatory process. This has been borne out by later works. At the Conference such material was brought out on the great effectiveness of pyrimidine products for use in the postoperative period (A. L. Pandman, B. A. Chumak, V. I. Rusakov, G. Ye. Sokolovich, M. V. Rubin), for the healing of burns (V. V. Seratschenko, I. P. Grekh), bone fractures (M. A. Korendyasev), ulcerous diseases (A. L. Lande) experimental stomach ulcers (Ye. A. Snegirev), cerebral trauma and trauma of the peripheral nerves (M. A. Rosin, V. I. Generalov), first attacks of rheumatism (A. F. Golikov), defects of corneal epithelium (N. N. Samoylov), several ear diseases (A. P. Velitskiy), and other types of experimental inflammation (B. A. Chirkov).

Pyrimidine products have the following characteristics: they 1) quicken the healing of wounds and restore damaged nerve tissue, 2) increase the speed of post-operative scarring, 3) enable a quicker liquidation of the disease syndrome, 4) diminish the amount of post-operative complications, 5) weaken exudation and thrombosis, 6) stimulate leucopoiesis and heighten the phagocytic activity of the leucocytes, and 7) have almost no toxic effect. On the basis that in adrenalectomized animals, these drugs lose their counter-edematous effect, but continue to strengthen regeneration, it is possible to suppose that the strengthening of proliferation comes about due to the direct effect of the pyrimidines on the tissue. The weakening of exudation is due to their mediating effect through

the pituitary-adrenal axis.

Material was also given on the use of pyrimidine products in combination with other drugs which better the origins and course of the inflammatory process (V. V. Borshchenko, I. F. Grekh, V. I. Generalov, M. V. Mukhin, M. A. Rozin, N. N. Samoylov, G. Ye. Sokolovich). The people giving the reports noted in the discussion that the synthesis and clinical use of the pyrimidine products for stimulating the regenerative process, first discovered and produced only in the USSR, had been completely proven.

For the provisioning of the clinics and experimental laboratories with these drugs, it was necessary to significantly increase their production.

At the Conference a number of reports were given on the use of other compounds used in the control of inflammation (V. V. Borshchenko, I. I. Brekhan, P. P. Golikov, M. A. Grinevich, A. P. Velitskiy, V. I. Pušakov, E. S. Kharatsova, K. A. Meshcherskaya, A. B. Obukhova, N. S. Chernyshova, G. A. Mikhaylets, M. V. Mukhin and others). It was shown that the anti-inflammatory effect of anti-tubercular drugs (Para-aminosalicylic acid, phthio-vasin, streptomycin) are secondary; the effect is connected with the suppression of the life activity of the microbes

(G. A. Mikhaylets). The proposal was made that the anti-adenic effect of ginseng is the result of local effects of its steroid compounds, as is noticed in paracorticotized animals (I. I. Brekhan, P. P. Golikov, M. A. Grinevich).

The report of L. S. Salyamon "Inflammation and Cancer" included the following: 1) an analysis of the materials on the effect of inflammation on tumor metastasis; 2) the effect of an inflammatory seat on an already-existing tumor; and, 3) the function of inflammation in the process of cancerogen. The speaker proposed that tissue malignancy arises as a result of a protracted and retarded inflammation, which is ceased by a combination of damaging and antiphlogistic influences.

A morphological characterization of the inflammatory and regenerative processes was given in a number of works (S. S. Vail, B. V. Pinchuk, S. I. Shehelkunov, L. D. Liozner, I. V. Markelova, and others).