

THE EFFECT OF PARASYMPATHETICOTROPIC DRUGS ON THE
PHAGOCYTIC POWER OF THE LEUKOCYTES IN CANCER PATIENTS
(PRELIMINARY COMMUNICATION)

N. V. Puchkov and P. P. Firsova

Laboratory of Pathophysiology (Head, Professor N. V. Puchkov), Institute of
Pediatrics, Academy of Medical Sciences of the USSR, and A. V. Vishnevskii
Institute of Surgery (Director, Active Member AMN SSSR A. A. Vishnevskii),
Moscow

(Presented by Active Member AMN SSSR A. A. Vishnevskii)

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The work of N. V. Puchkov [1], who studied the role of the nervous system in phagocytosis, showed that sympathin (a product of excitation of the sympathetic nervous system) activates phagocytosis, while vagus substance (a product of excitation of the parasympathetic nervous system) depresses it. In experiments on animals and clinical studies of patients, N. V. Puchkov and G. G. Golodets [2, 3] observed a depression of phagocytosis after injecting 0.5 ml of a 1% solution of pilocarpine, the degree of which was modified in diseases associated with a lowering of the excitability of the parasympathetic nervous system. P. P. Firsova [4] used the same technique in clinical studies and showed that in all cases of both acute and chronic inflammatory diseases, pilocarpine depressed the phagocytic power of the leukocytes. In acute inflammation, the depression of phagocytosis was much more marked than in chronic.

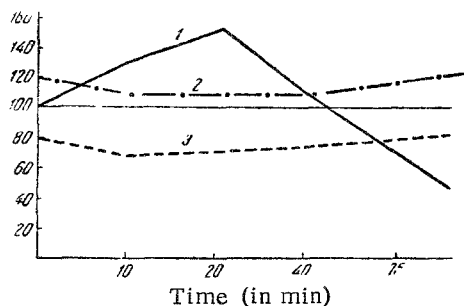
We have used N. V. Puchkov's technique [1] to study the changes in the phagocytic activity of the leukocytes in cancer patients caused by pilocarpine.

A subcutaneous injection of 0.5 ml of a 1% pilocarpine solution was given. The investigation of the patients began after the normal breakfast and in identical conditions. The phagocytic activity of the leukocytes was determined in 0.02 ml of blood taken from the patient's finger pulp before the injection of pilocarpine and 10, 20, 40, and 75 min thereafter. As material for phagocytosis we used a suspension of homogeneous particles of carpine in physiological saline. Besides investigating phagocytosis, changes in the blood pressure were also studied at the same time intervals after the injection of pilocarpine.

Altogether 12 patients were investigated, of whom 6 had carcinoma of the lung, 2 – carcinoma of the stomach, 2 – carcinoma of the breast, 1 – carcinoma of the esophagus, and 1 – carcinoma of the rectum.

The phagocytic activity in 9 patients was modified after the subcutaneous injection of 0.5 ml of a 1% solution of pilocarpine. The activity of the leukocytes rose sharply in response to the injection of pilocarpine, a phenomenon never observed in healthy subjects. In some patients only 10 min after the injection of pilocarpine phagocytosis was increased on the average by 70%, and the activity of the leukocytes returned to or below its initial level after 75 min. In other patients an increase in the phagocytic activity of the leukocytes appeared 20 min after the injection of pilocarpine, and 75 min after the injection it was still above its initial value. Meanwhile the arterial pressure showed a tendency to fall (see figure).

The results suggest that in some patients with cancer the disturbance of the functional state of the leukocytes is apparently due to the underlying pathological process – the malignant oxycosis – which has a specific action on the activity of the leukocytes. There is also the possibility that the phagocytic activity of the leukocytes in patients with cancer, and its response to injection of pilocarpine, may be dependent on the extent of spread and the stage of development of the malignant growth. The more intensively the cancer develops, the greater the functional changes affecting the organs and tissues, including the leukocytes, which have a protective function and which are the first to react to the injurious factors of the pathological process. The immediate reaction to pilocarpine obtained in three cancer



Curve showing the changes in the phagocytic reaction (1) of the blood and in the arterial pressure (2 – maximal and 3 – minimal) in cancer patients after the subcutaneous injection of 0.5 ml of a 1% solution of pilocarpine.

state of leukocytes was evidently provoked by the main pathological process – cancer intoxication causing a specific and maybe sensitizing action on the leukocyte activity. A possibility is also not excluded that in cancer patients the phagocytic activity of leukocytes in response to the administration of parasympathicotropic substance may depend on the extent, form, and stage of cancer process.

LITERATURE CITED

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patients may be attributed to the fact that, despite the presence of cancer, the leukocytes, like other tissues, still preserved their normal sensitivity to parasympathicotropic drugs.

Because of the small number of observations, no final conclusions can be drawn although, in our opinion, the investigation of the reactivity of the leukocytes may be used clinically as an accessory diagnostic test, giving information about the character and course of the disease.

SUMMARY

In 12 cancer patients the phagocytic activity of leukocytes was studied after subcutaneous injection of 1% pilocarpine solution (0.5 ml). In 9 of the 12 patients investigated the phagocytic reaction proved to be perverted, i.e., the leukocytic activity increased greatly in response to pilocarpine administration. The data obtained made it possible to assume that in cancer patients disturbance of the functional

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