DENDRITIC CELL PHENOTYPES OF THE CENTRAL LYMPH IN INTACT RABBITS AND DURING CORRECTION OF EXPERIMENTAL ATHEROSCLEROSIS

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Dendritic cells [2], which are among the basic antigen-producing cells [7, 8, 12], and which are the principal cells in the stage of the immune response [4, 9, 10], are known to circulate in the central lymph.

The diversity of phenotypic features of the dendritic cells of the central lymph under normal conditions in intact animals, in athersclerosis, and during its correction by polyphenol preparations obtained from *Sanguisorba officinalis* L. and radon, and also with a combination of both, has made it necessary to classify these cells, and the investigation described below was carried out for that purpose.

EXPERIMENTAL METHOD

The investigation was conducted on 120 male chinchilla rabbits weighing 2-3.5 kg. The experimental animals as a whole were divided into groups: 1) intact; 2) animals with atherosclerosis; 3) animals with correction of atherosclerosis by radon; 4) animals with correction of atherosclerosis by polyphenol preparations obtained from *Sanguisorba officinalis* L.; 5) animals with atherosclerosis corrected by polyphenol preparations from *S. officinalis* L. combined with radon. The model of atherosclerosis was created by feeding rabbits with cholesterol in a dose of 3 mg/kg body weight daily for 60 days. The polyphenol preparations from *S. officinalis* were given to the animals perorally through a tube in a dose of 10 mg/kg body weight on alternate days, simultaneously with feeding the animals with cholesterol. The radon procedures began in the form of radon baths, in accordance with the usual plan: 15 baths on alternate days, each lasting 15 min. Lymph samples were taken from the cisterna chyli, under local anesthesia with 0.25% procaine solution, using glass micropipets made in accordance with Author's Certificate (Russia) No 1495076. Films were made by the usual method from the lymph thus obtained and stained by the Romanovsky–Giemsa method, and then studied under a "Leitz" light microscope. The test object consisted of dendritic cells, which were identified by the shape of the cell body and also by the number, character of formation, and branching of the processes given off by them The efficacy of the model of atherosclerosis and its correction was determined by the presence or absence of atherosclerotic plaques in the intima of the aorta, and also by the mortality rate (in %) of the animals After the experiment the animals were killed by injection of an aqueous solution of thiopental sodium into a vein of the ear. The experiments were carried out in October.

EXPERIMENTAL RESULTS

In all the animals of group 2, atherosclerotic plaques were found in the intima of the aorta, and the mortality rate exceeded 40%, whereas in group 1 it was under 3.0%. In the animals of groups 4 and 5 the intima of the aorta was unchanged and the mortality rate corresponded to the control level (animals of group 1). The central lymph of

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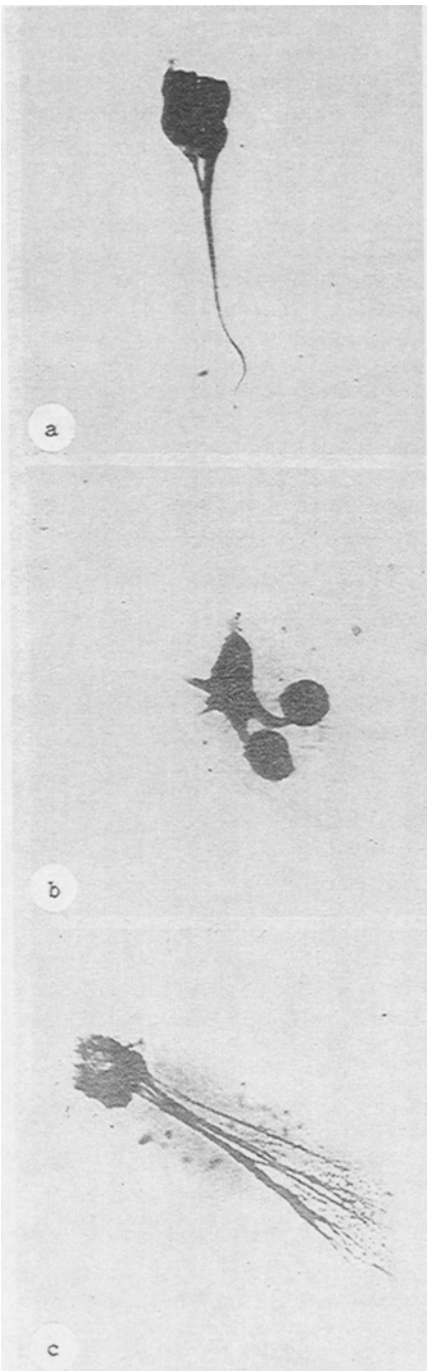

Fig. 1. Dendritic cells of central lymph of rabbits: a) type 1 dendritic cell; b) type 2 dendritic cell with unbranched processes, in contact with lymphocytes; c) type 2 dendritic cell with branching processes Stained by Romanovsky–Giemsa method Ocular 10, objective 60.

the rabbits contained dendritic cells, confirming the results of previous investigations [12]. The phenotype of these cells agreed basically with the phenotype of dendritic cells isolated from mesenteric lymph nodes [5]. Dendritic cells of the central lymph of rabbits are characterized by processes of complex shape, branching from the cell body. Meanwhile dendritic cells in each of the experimental groups had phenotypic differences, collectively enabling two main types of these cells to be distinguished.

The first type includes dendritic cells with a round body and with distinct boundaries, from which one process arises (Fig. 1a). The process appears compact, it is unbranched, and it gradually tapers from its base to its apex. The body of dendritic cell usually has evaginations dendritic cells of this kind are found more often in the central lymph of intact animals.

The second type consists of dendritic cells whose body may have a variety of shapes, with two or more processes In turn, among cells of the second type the following can be distinguished: a) cells (Fig. 1b) whose processes are compact and do not branch throughout their length from base to apex. Through these processes the dendritic cells maintain good contacts with lymphocytes; b) cells (Fig. 1c) whose processes have a complicated system of branches. Dendritic cells of this kind are found in the central lymph mainly of animals of experimental groups 2, 3, 4, and 5. The processes may commence at the same pole or at opposite poles, and also around the whole perimeter of the body of the dendritic cell.

Dendritic cells have been shown to receive an antigen–antibody complex through contract of their processes with the pseudopodia of macrophages [11]. In turn, cholesterol, administered internally, causes significant changes in the immunocompetent systems of the experimental animals [3]. It has also been suggested that the polyphenol preparations of *S. officinalis* have a definite action on the immune system [1] There is evidence that dendritic cells can change their morphological features depending on antigenic stimulation [6].

It will be evident from the facts described above that the predominance of the phenotype type of dendritic cells described above in the central lymph of animals of definite experimental groups is an adaptive-compensatory reaction to atherosclerosis and to its correction.

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