Taban-Arshan: Immunocorrector in Atopic Bronchial Asthma

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Taban-Arshan extract decreased expression of T-lymphocyte activation markers, normalized T-cell-mediated immunity, and suppressed increased activity of natural killer receptors during culturing with lymphocytes of patients with atopic bronchial asthma. Taban-Arshan extract normalized activation processes in the B-cell immunity and stimulated expression of receptors of activation-induced apoptosis.

Key Words: *lymphocytes; surface antigens; atopy; Tibetan medicine; immunocorrection*

Involvement of the immune system in the pathogenesis of some diseases makes these diseases particularly difficult for treatment, despite recent progress in medical sciences. Therapeutic methods are either not sufficiently effective, or are associated with severe side effects.

Plant preparations, which as a rule induce no pronounced side effects, attract much recent attention. Of particular interest is natural armory of Tibetan medicine. Many preparations used in Tibetan medicine are characterized by high pharmacotherapeutic activity comparable to that of modern synthetic drugs.

Taban-Arshan is a popular composition of Tibetan medicine; it is widely used in popular medicine for the treatment of inflammatory diseases [2]. The mechanisms of immunotropic effect of this preparation were never described.

We studied the effects of Taban-Arshan extract used in Tibetan medicine on functional activity of immunocompetent cells from healthy donors and patients.

MATERIALS AND METHODS

The study was carried out on lymphocytes from 24 patients with atopic asthma at the stage of exacerbation. All patients were examined by routine methods.

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Thirty healthy subjects aged 20-35 years served as controls.

Lymphocyte suspension for immunological study was isolated in a Ficoll-Verograffin density gradient by the method of A. Boyum. The content of peripheral blood lymphocytes expressing surface antigens was evaluated by indirect immunofluorescence using monoclonal antibodies. The cells were isolated under sterile conditions and cultured in a final concentration of 2.5×10^6/ml at 5% CO_2 and 37°C for 16 h. The concentration of the test preparation was 10^{-7} M. The results were processed by methods of variation statistics using Statistica software; the significance of differences was evaluated using Student's *t* test.

RESULTS

In previous studies Taban-Arshan exhibited no activating or inhibitory effects on the expression of surface receptors on donor lymphocytes and did not change viability of immunocompetent cells.

The effect of Taban-Arshan on the content of the major populations of T-, NK-, and B-lymphocytes in cell culture derived from patients with atopic bronchial asthma during exacerbation (Table 1) was studied.

Taban-Arshan increased the counts of total T-lymphocytes under conditions of cell culturing. In the presence of the test extract expression of helper lym-

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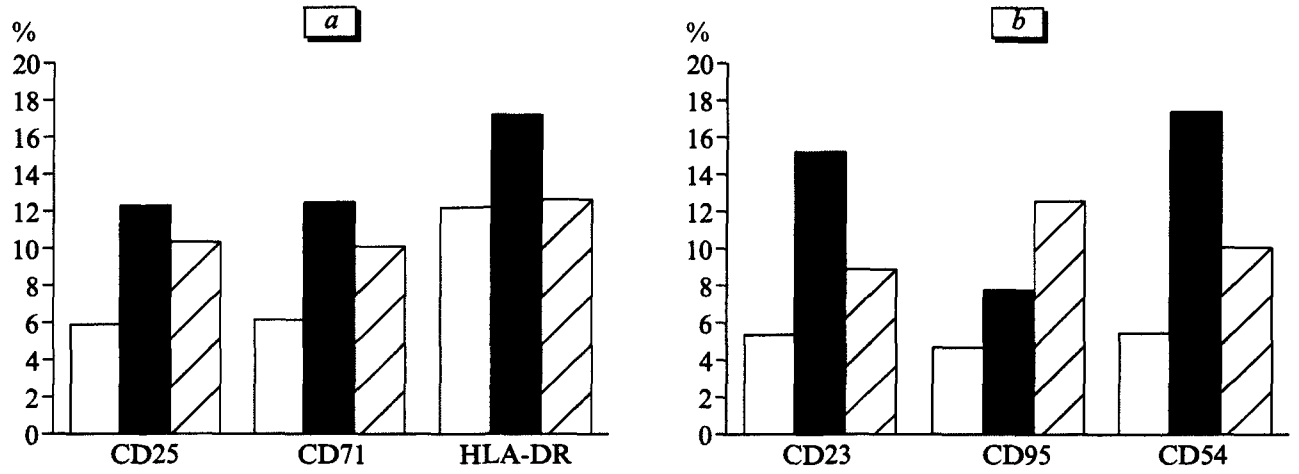

Fig. 1. Expression of activation antigens (*a*, *b*) by lymphocytes of patients with atopic bronchial asthma under the effect of Taban-Arshan. Light bars: donor lymphocytes; dark bars: lymphocytes of patients receiving no Taban-Arshan; hatched bars: lymphocytes of patients treated with Taban-Arshan.

TABLE 1. Effects of Taban-Arshan on Expression of Surface Receptors on Lymphocytes from Patients with Asthma (in %; n=8; $M \pm m$)

Lymphocyte markers	Before culturing	Lymphocyte culturing	
		without extract	with Taban-Arshan
CD3	47.20±0.76	51.35±1.99	55.90±1.99*
CD4	30.34±1.89	33.87±3.68	35.72±1.69
CD8	19.54±1.66	23.10±2.65	26.30±1.71
CD16	11.35±3.24	19.40±2.09	13.75±1.84*
CD56	6.68±1.02	8.11±1.94	8.60±1.60
CD20	22.76±1.47	16.35±2.15	11.00±1.64*
CD72	15.36±2.07	13.48±1.24	9.10±1.73*
mIgM	17.53±2.26	11.83±1.13	10.40±1.45
mIgG	11.87±1.99	9.98±1.78	9.80±0.57

phocytes and the count of cytotoxic T-cells (CD8) returned to normal. Taban-Arshan appreciably and significantly reduced the expression of CD20 and CD72 receptors to level observed in donors (p<0.05), *i. e.* the number of mature antigen-primed B-cells did not increase [1,4].

The count of B-lymphocytes expressing CD38 surface receptor in cell culture decreased in the presence of Taban-Arshan, which reflects inhibition of transformation of mature B-cells into plasma cells.

Taban-Arshan significantly decreased expression of B-lymphocyte activation markers (CD23) and late activation marker of HLA-DR lymphocytes; expression of CD25 and CD71 early activation markers tended to decrease (Fig. 1). The count of cells expressing CD54 adhesion receptor also decreased (p<0.05). Taban-Arshan significantly increased the expression of CD95 receptor of activation-induced apoptosis (Fig. 1, *b*). Stimulation of CD95 expression on lymphocytes under the effect of the extract leads to activation of apoptosis, because this process depends on Fas-FasL cell interaction [3]. The increase of Fas antigen expression presumably increases apoptosis induction by these cells.

The extract used by Tibetan medicine is characterized by a pronounced immunomodulating effect.

Our results confirmed its capacity to correct the immune response in inflammatory diseases. Taban-Arshan corrected changes in the immune system, suppressed hyperactivation of B-cells. Moreover, this extract modified the expression of T-lymphocyte activation markers, normalized T-cell immunity, suppressed increased activity of natural killer receptors, and increased expression of receptors of activation-induced apoptosis during culturing.

Hence, Taban-Arshan extract had no effect on donor lymphocytes, but normalized surface receptors of lymphocytes from patients with allergic diseases.

The studied extract can be used as an immunomodulating agent, which suggests further preclinical trials and introduction in clinical practice.

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