DYNAMIC CHANGES OF ADHESIVE PROPERTIES OF LYMPHOCYTES IN PSORIASIS PATIENTS ON THALASSOTHERAPY

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The pathogenetic mechanisms which determine the development of psoriatic plaque are still unknown. There exist some data that a mononuclear infiltration is formed in the upper layer of the pathologically changed skin that is presented mainly by macrophages (5) and T-lymphocytes (3). Polynuclear leukocytes migrate into the epidermis and form the so-called "Munro's microabscesses" (6). The mechanism of the accumulation of these cells during psoriatic plaque formation is not clarified. There are data indicating that chemotactic, (13), migration (11), and phagocytic (12) properties of peripheral blood lymphocytes are enhanced. Probably these phenomena lie at the root of dermal infiltration formation. Along with that there are data available which show that polynuclear leukocytes of psoriasis patients possess a strongly increased adhesion ability "in vitro" (14). This fact can also be related to the dynamics of growth of pathologic alterations in psoriatic lesions.

There are no data available about the adherence properties of mononuclear leukocytes including lymphocytes, too.

The purpose of the present work was to study the dynamic changes of the adhesive properties and lectin-induced adherent response of peripheral lymphocytes in psoriasis patients on thalassotherapy.

Material and methods

The investigation was carried out on isolated lymphocytes of 39 psoriasis patients aged between 12 and 60 years (20 females and 19 males). Of them 11 patients were in an active stage, 19 ones — in hospital one and 10 ones in regressive stage of the illness. The control group consisted of 31 clinically healthy persons aged between 19 and 52 years (18 females and 13 males). Spontaneous adherence properties of lymphocytes were studied before and after thalassotherapy with a mean duration of 25 days of all patients.

Human blood was taken by venous puncture in amount of 5 cc. The lymphocytes were separated after Boyum's method (4) and twofold washed with a buffer saline solution. A necessary concentration of cells was reached in Difco-199 medium (Difco Laboratories, Detroit, Michigan, USA) enriched with 10 per cent veal embryonal serum (Difco Laboratories, Detroit, Michigan, USA). A spontaneous lymphocyte adherence (SLA) was determined after modified method of Halliday (8). A lymphocyte suspension (in concentration 2×10^6 cells/ml) was put into Burker's chambers. The incubation was 1 hour at 37 °C in strictly horizontal position. The percentage of adhered cells was determined according to the formula:

$$\% \text{ spontaneous adhesion} = \frac{\text{mean number of cells (square) after washing}}{\text{mean number of cells (square) before washing}} \times 100$$

The washing was realized by means of taking off the cover glass followed by immersion seven times of chambers into buffer saline solution.

Lectin-induced adherent response of lymphocytes (LIARL) which reflects the reactivity of their cell surface during interaction with lectins was determined after Altankov's method (1) by using especially elaborated glass chambers with capacity of 3 ml which were also filled with the obtained suspension (1×10 cells/ml) and cultivated 1 hour at 37 °C. Half the samples were added 100 mkg/ml[6] Phytohaemagglutinin-P/Difco Laboratories, Detroit, Michigan, USA/. The rest were controls (spontaneous adherence). All the estimations were carried out twofold. The amount of adherent cells was determined after incubation (1) and LIARL was calculated according to the formula:

$$\text{LIARL} = \frac{\text{MEAN NUMBER OE CELLS ON FIELD + PHA}}{\text{MEAN NUMBER OF CELLS ON FIELD — CONTROL}}$$

Results and discussion

The results obtained show that peripheral lymphocytes have the ability for glass adherence at the average $14{,}55 \pm 1{,}76$ per cent in psoriasis patients before thalassotherapy. Concerning the controls this percentage is $11{,}9 \pm 1{,}4$ (see table 1). However, these differences are statistically insignificant ($p > 0{,}05$).

Table 1

Spontaneous lymphocyte adhesion in psoriasis patients before and after thalassotherapy

	% Spontaneous lymphocyte adhesion			
	Number	x ± SEM	CL	P
Psoriasis patients before thalassotherapy	34	$14{,}55 \pm 1{,}76$	$11{,}15 \div 17{,}95$	$>0{,}05$
Psoriasis patients after thalassotherapy	31	$13{,}95 \pm 1{,}26$	$11{,}47 \div 16{,}43$	$>0{,}05$
Controls (healthy)	31	$11{,}9 \pm 1{,}4$	$9{,}1 \div 14{,}7$	

SLA of psoriasis patients before thalassotherapy shows a distinct dependence on the stage of the disease. It is $30{,}0 \pm 3{,}3$ per cent ($p < 0{,}01$) when 8 patients in active stage are considered. However, it comes up to the controls ($12{,}6 \pm 1{,}5$ per cent, $p > 0{,}05$) in patients in hospital stage while it diminishes statistically reliably ($5{,}35 \pm 1{,}52$ per cent, $p < 0{,}05$) (in 16, respectively 10 patients) (fig. 1).

The observed correlation between SLA and clinical stage of the disease could be in a sense related to the mechanism by which these cells are distributed and precipitated in the organism and, respectively, in pathological focuses, the so-called lymphocyte "homing" (10). It is supported by the data of some authors (15, 16) that psoriatic squamae contain leukotactic substances which are formed during complement activation. The participation of certain chemotactic products in relation with abnormal metabolism of arachydonic acid can't be excluded (9). It

has to be also noted that according to R. H. Cormane et al. (6) some antibodies against cell nuclei of basal layer of intact skin transported by the membranes of polymorphonuclear leukocytes and lymphocytes are detected in psoriasis patients. This, therefore, allows to suppose the participation of a specific mechanism of cell accumulation in skin infiltrate.

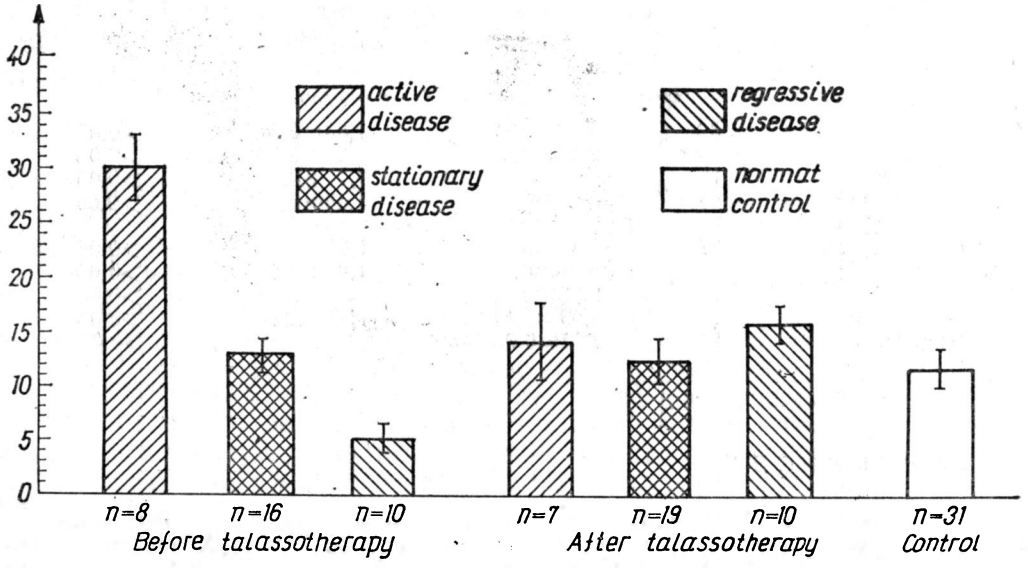

Fig. 1. Lymphocyte adherence in patients with psoriasis, according to the disease activity, before and after thalassotherapy

Favourable results from thalassotherapy (moderate, strongly expressed improvement and clinical healing (remission) were observed in most patients. The clinical effect corresponded with the tendency towards equalization of SLA rates in single patients' groups with these of the controls: in the active stage — 13,93±3,22 per cent; in the hospital one — 13,18±2,06 per cent, and in the regressive one — 15,42±2,07 per cent.

However, the results obtained about LIARL rates in single clinical patients' groups before and after thalassotherapy, on the one hand, and in control persons, on the other, did not demonstrate any reliable differences (see table 2).

All that testifies that the established changes of initial adherence properties of lymphocytes must be related not with local, membrane changes but, more probably, with the presence of certain definite changes of cell micromedium. It is confirmed by the data that leukocytes including lymphocytes, too, can actively modify their adhesive properties in the presence of humoral factors (2, 7).

Based on the results about spontaneous and lectin-induced properties of lymphocytes we are allowed to conclude that:

1. They contribute to the understanding of the pathogenetic mechanisms of formiug the pathologic changes in psoriasis.

2. This index can be successfully used as an impartial criterion for determination of prognosis in psoriasis patients.

Table 2

Lectin-induced adherent response of lymphocytes (relative units) in psoriasis patients depending on the stage of the disease (before and after thalassotherapy)

	Lectin-induced adherent response of lymphocytes			
	Number	$\bar{x} \pm$ SEM	CL	p
Psoriasis patients before thalassotherapy	32	2,06±0,12	1,83÷2,29	>0,05
Active stage	9	2,08±0,37	1,23÷2,93	>0,05
Hospital stage	15	2,03±0,16	1,7 ÷2,36	>0,05
Regressive stage	8	2,06±0,27	1,45÷2,67	>0,05
Psoriasis patients after thalassotherapy	37	2,16±0,08	1,99÷2,23	>0,05
Active stage	8	2,16±0,11	1,92÷2,4	>0,05
Hospital stage	19	2,23±0,14	1,94÷2,52	>0,05
Regressive stage	10	2,09±0,14	1,77÷2,41	>0,05
Controls (healthy)	14	2,11±0,08	1,93÷2,29	>0,05

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ДИНАМИЧЕСКИЕ ИЗМЕНЕНИЯ АДГЕЗИВНЫХ СВОЙСТВ ЛИМФОЦИТОВ ПРИ ПСОРИАЗЕ И ЭФФЕКТ АКТИВНОГО МОРЕЛЕЧЕНИЯ

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РЕЗЮМЕ

Исследованы адгезивные свойства человеческих периферических лимфоцитов у 31 здорового донора и у 39 больных псориазом. Процент адгезивных клеток у здоровых индивидов оказался 11,9 % ±1,4, а у больных — 14,55 % ± 1,76. Установлена хорошо выраженная корреляция между клиническими стадиями заболевания и процентом спонтанной адгезивности лимфоцитов: в прогрессирующей стадии — 30,0 % ± 3,3 (p 0,01), в станционарной стадии — 12,6 % ± 1,5 (p 0,05), а в регрессирующей стадии — 5,35 % ± 1,52 (p 0,01). После активного морелечения эти показатели изменяются с тенденцией к возвращению к норме.