An Analysis of T-Lymphocyte Subpopulations in Psoriasis Using Monoclonal Antibodies

F. KOKELJ, S. PERTICARARI,[1] G. PRESANI[1] and G. TREVISAN

University of Trieste and Department of Dermatology, [1]Department of Clinical Research, Pediatric Institute, Trieste, Italy

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We evaluated subpopulations of T-lymphocytes by using the monoclonal antibodies OKT3, OKT4 and OKT8 in two groups of psoriatic patients, with active and stable psoriasis respectively. Whereas data from the patients with stable psoriasis were similar to those obtained from the control group, the patients in an acute flare condition revealed a relative decrease in lymphocytes reactive with OKT8, and a slight increase in the proportion of lymphocytes reactive with OKT4. The results of this study are analysed. *Key words: Psoriasis; T-lymphocytes; Monoclonal antibodies.* (Received November 16, 1982.)

F. Kokelj, Clinica Dermatologica, Ospedale Maggiore, Via C. e G. Stuparich, 1-34125 Trieste, Italy.

The primary and/or secondary role of the immune system in psoriasis has become one of the main subjects of investigation in this skin disorder since the 1970s. Several papers have been published, but the hypotheses and conclusions are often contradictory.

The purpose of this paper is to evaluate the T-lymphocyte subpopulations in two groups of psoriatic patients, using a relatively recent and increasingly widespread technique.

MATERIALS AND METHODS

We selected two groups of patients with psoriasis vulgaris.

The first group (Group A) consisted of 25 patients (15 males and 10 females with an average age of 43±14). This group was studied during the acute flare phase.

The second group (Group B) was formed by 21 patients (9 males and 12 females with an average age of 32±18). All these patients had stable psoriasis vulgaris.

Both groups had received either no therapy at all, or only topical treatment. None had used steroid compounds for the last 5 months. No patient showed any other disease that might be attributed to an impairment of the immune system: they did not even present common disorders such as respiratory diseases, or complained of them previously.

A control group was formed by 20 healthy subjects (8 males and 12 females with an average age of 28±9).

T-lymphocyte subpopulations

Using the indirect immunofluorescence technique, we evaluated the proportion of lymphocytes reactive with OKT3, OKT4 and OKT8 (Orthoclone) monoclonal antibodies.

The microscope used had an immersion lens 63× (Leitz Dialux 20EB) with reflected light (filter 12; exciter lamp HB 0/100 Osram).

Table I

	$OKT3^+$	$OKT4^+$	$OKT8^+$	$OKT4^+/OKT8^+$
Healthy	69%±5	46%±4	34%±4	1.34±0.10
Psoriatic (stable psoriasis)	73%±8	48%±6	32%±5	1.49±0.28
Student's *t*-test	NS	NS	NS	$p<0.05$

Statistical tests

We used the Student's *t*-test method to compare the results of the two psoriatic groups and the control group.

RESULTS

The proportion of all T-lymphocytes defined by monoclonal antibodies (OKT3) was almost identical in both psoriatic groups and the control group.

The group of patients with stable psoriasis and the control group showed no significant differences in the percentage of lymphocytes with membrane-bound receptors for OKT4 and OKT8 antibodies; the ratio $OKT4^+$ lymphocytes/$OKT8^+$ lymphocytes had increased (1.49±0.28) in comparison with the control group (1.34±0.10).

The proportion of lymphocytes reactive to OKT4 (50%±6) in patients with acute psoriasis was slightly higher than in the control group (46%±4). Highly significant in these patients was the percentage decrease in cells delineated by OKT8 (24%±6) and the subsequent increase in the ratio $OKT4^+$ lymphocytes/$OKT8^+$ lymphocytes (2.1±0.5), in comparison with the control group ($OKT8^+$: 34%±4) (ratio 1.5±0.3).

DISCUSSION

Various data in the literature support the possible role of the immune system in the pathogenesis of psoriasis. These include: the increased presence of certain antigens of the HLA system; the alteration in the level of some gammaglobulins in serum and saliva; the presence of anti-stratum corneum antibodies and a defect of the cell-mediated immunity. As far as the lymphocyte subpopulations are concerned, some authors (5, 9) who have studied the in vitro conA stimulation of lymphocytes, have already suggested a possible decrease in suppressor cells in the blood of psoriatic patients. Ligresti et al. (7) who evaluated the T-cell subpopulations by means of receptors for IgG (Tg) and IgM (Tm) reached the same conclusions—in contrast to Gu et al. (4) who suggested a greater number of some suppressor cells.

In the present work we evaluated the lymphocyte subpopulation by means of the monoclonal antibodies OKT3, OKT4, OKT8 (Orthoclone) technique. It seems important to recall that some previous research has pointed out the oversimplification currently in evidence in the literature (3), according to which helper and suppressor cells are defined by the membrane-bound receptors for the antibodies of the OKT series (OKT4, OKT8) and so it is possible that $OKT8^+$ and suppressor cells do not coincide (8); moreover, it has been demonstrated that certain OKT4 lymphocytes are even capable of exerting a suppressor effect (10). As far as psoriasis is concerned, both Fulton et al. (3) and Berger et al. (1), having tested groups of patients with various skin disorders with monoclonal antibodies, found no difference between controls and psoriatic patients.

Table II

	$OKT3^+$	$OKT4^+$	$OKT8^+$	$OKT4^+/OKT8^+$
Healthy	69%±5	46%±4	34%±4	1.34±0.10
Psoriatic (acute flare phase)	69%±7	50%±6	24%±6	2.15±0.52
Student's *t*-test	NS	$p<0.05$	$p<0.001$	$p<0.001$

We decided, in our study, to select the patients meticulously, paying attention to both the therapy and to any other disease related to a defect of the immune system. There was a marked difference between the two groups of patients, and also an almost identical result between the cases with stable psoriasis and the healthy subjects, with the exception of the $OKT4^+/OKT8^+$ ratio. All the patients in an acute phase (the tests were always performed in the phase of clinical deterioration) presented a proportional decrease in lymphocytes with membrane-bound receptors for OKT8 antibodies: it is accepted by most authors that these antibodies are capable of defining both suppressor and cytotoxic lymphocytes (2). These data are consistent with the statements of Ligresti et al. (7) and with our preliminary results (6) but differ from those of Fulton et al. (3), possibly because this author may have considered only patients in a stable phase. A defect of the suppressor cell function in psoriasis, either primary or secondary to this skin disorder, might explain the immunologic alterations present in psoriasis.

In conclusion, there is certainly an important alteration in the lymphocyte subpopulations in the peripheral blood of psoriatics, though only in the acute phase. This may explain the contradictory data in the literature. This alteration is characterized by an imbalance of the lymphocytic subpopulation with an increase of the helper/suppressor ratio. Only with further careful analysis of individual patients, an evaluation of the distribution of dermic lymphocytic infiltrates and a deeper knowledge of functions of lymphocytes $OKT4^+$ and $OKT8^+$ will the role played by the lymphocyte subpopulations in psoriasis be more clearly defined.

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