

## T- AND B-CELLS AND IgE IN MYCOSIS FUNGOIDES

Hugh Zachariae, Jørgen Ellegaard, Eva Grunnet, Helmer Sogaard and Henning Thulin

From the Department of Dermatology, Marselisborg Hospital, The Department of Internal Medicine, Aarhus Amisssygehus and the Department of Pathology, Aarhus Kommunehospital, University of Aarhus, Aarhus, Denmark

**Abstract.** The role of T- and B-lymphocytes and serum IgE was studied in 22 patients with mycosis fungoides. The distribution of B-cells in peripheral blood was normal, while the mean percentage of T-cells was significantly lower than in 14 healthy controls. Four patients with mycosis fungoides in stages I to IV had a highly elevated serum IgE, while serum IgE in remaining patients was slightly elevated, normal, or subnormal. The mean serum IgE level was not significantly elevated. Our results tend to show that a reduced ability to react with cellular immunity may be an important factor in mycosis fungoides. This may have therapeutic aspects.

**Key words:** T-lymphocytes; B-lymphocytes; IgE; Mycosis fungoides

The fact that immunity and malignancy are inter-related is a major discovery in medicine with possible therapeutic aspects. In mycosis fungoides, which has been suggested to be a T-cell lymphoma (4) (such as Sézary's syndrome (12)) induction of new cellular immunity may be depressed (11). Recently, defective cell-mediated immunity has been found in patients with severe atopic dermatitis (1, 3, 6, 10) and related to high serum IgE and a reduced number of T-cells.

We therefore found it of interest to study circulating T- and B lymphocytes and serum IgE in patients with mycosis fungoides.

## MATERIAL AND METHODS

Twenty-two patients, 12 women and 10 men aged 15 to 85 years, diagnosed as having mycosis fungoides were included in the study. Staging of the disease (Table I) was made in accordance with van Scott (8). Patients in stages IV and V also had lymph node involvement. Most patients in stages II to IV had been treated with nitrogen mustard at our department for as little as one month and as long as 3 years, with remarkably little evidence of hypersensitivity appearing (5). Only in one patient was it necessary to discontinue this treat-

ment due to contact dermatitis. Two patients developed contact urticaria.

Eight patients have been included in our earlier study on immune response to primary immunization with brucella antigen (11) and showed a depressed cellular immunity.

The percentage of T-lymphocytes in peripheral blood was measured by formation of E-rosettes (13), and B-lymphocytes by formation of EAC-rosettes (2). All patients but 2 had a normal leucocyte- and differential count. Samples from one of the patients were mislaid, and it was not possible to repeat the investigation as this patient had subsequently died during treatment with bleomycin. Serum IgE was measured in all patients.

## RESULTS

Results for the percentage of E-binding (T) lymphocytes and EAC-binding (B) lymphocytes are shown in Figs. 1 and 2. Controls were 14 healthy individuals aged between 14 and 64 years. The data show that our patients with mycosis fungoides had a mean percentage of T-cells significantly lower ( $p < 0.001$ )

Table I. Staging of mycosis fungoides

| Stage | Histology          | Skin lesions                                                       | Lymph-adendopathy |
|-------|--------------------|--------------------------------------------------------------------|-------------------|
| I     | Compatible with MF | Erythematous plaque or generalized erythema                        | 0                 |
| II    | MF                 | Indurated plaques or papules, with or without generalized erythema | 0                 |
| III   | MF                 | Tumours, with or without papules, plaques, or generalized erythema | 0                 |
| IV    | MF                 | Plaques, papules or tumours with or without generalized erythema   | +                 |
| V     | MF                 | Any of the above and internal lesions                              | +                 |

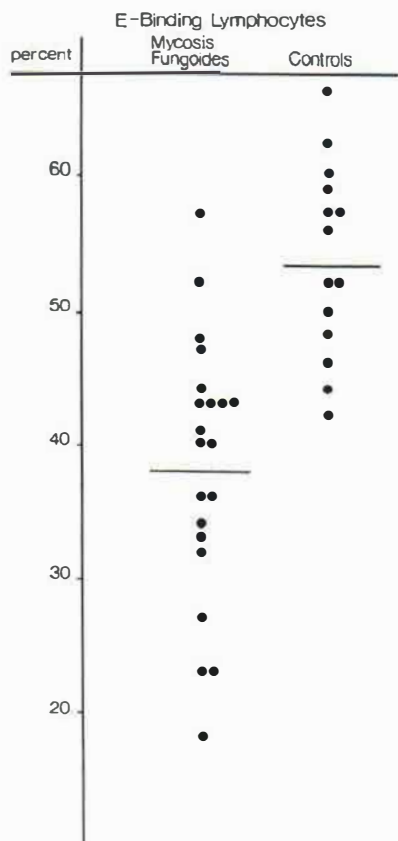


Fig. 1. Percentage of E-binding (T) lymphocytes in patients with mycosis fungoides and in controls. The mean value in patients with mycosis fungoides was  $38 \pm 2$  (S.E.) per cent; the mean value in controls was  $54 \pm 2$  (S.E.) per cent. The difference is statistically significant ( $p < 0.001$ ).

than the controls. The distribution of B-cells in peripheral blood was normal.

Four patients with mycosis fungoides had a highly elevated serum IgE value (Table II) although they were not atopic. Of these patients, one was in stage IV, one in stage III, one in stage II and one in stage I. Of the remaining patients, 2 had slightly elevated serum IgE while the rest had normal or subnormal values. The mean serum IgE level was not significantly elevated.

### COMMENTS

The results of our study show reduced values of circulating T-lymphocytes in patients with mycosis fungoides. In the present study no correlation was found between a high serum IgE and a reduced T-cell count, such as has been demonstrated among atopics (6). An elevated mean serum IgE has been

found by other workers in patients with mycosis fungoides (9); this finding could not be confirmed by the present study, although 4 of 22 patients had highly elevated IgE levels.

It is not possible for us to rule out the possibility that the reduced percentage of circulating T-cells could be due to the treatment. Most patients had received topical nitrogen mustard and responded well (5). It has been proposed that an equilibrium exists between T-cells in the skin lesions and circulating T-cells (4), and that by treating skin lesions and destroying T-cells in the periphery it is possible that the counts of circulating T-cells would then drop.

On the other hand a reduced ability to react with cellular immunity could be a major pathogenic mechanism in this disease, and this could have bearing on therapy. Our patient with the lowest T-cell value also had a poor response in lymphocyte transformation tests (14). This patient was treated with

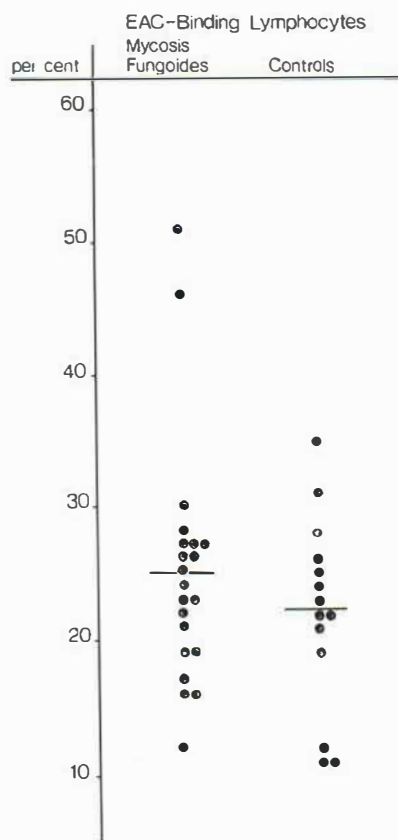


Fig. 2. Percentage of EAC-binding (B) lymphocytes in patients with mycosis fungoides and controls. The mean value in patients with mycosis fungoides was  $25 \pm 2$  (S.E.) per cent. The mean value in controls was  $22 \pm 2$  (S.E.) per cent.

Table II. Serum IgE, percentage of E-binding (T) and EAC-binding (B) lymphocytes and staging in patients with mycosis fungoides

| Pat. no | Sex/Age | Stage | IgE <sup>b</sup> | T-Cells      | B-Cells      |
|---------|---------|-------|------------------|--------------|--------------|
| 1       | F/49    | I     | 47               | 44           | 30           |
| 2       | M/76    | I     | 308              | 43           | 17           |
| 3       | F/55    | I     | 495              | 52           | 19           |
| 4       | M/68    | I     | 605              | 34           | 16           |
| 5       | F/52    | I     | 2 770            | 43           | 17           |
| 6       | M/52    | II    | 14               | 43           | 27           |
| 7       | F/82    | II    | 25               | 23           | 21           |
| 8       | M/66    | II    | 27               | 40           | 27           |
| 9       | F/36    | II    | 31               | 33           | 51           |
| 10      | F/52    | II    | 37               | 41           | 16           |
| 11      | F/66    | II    | 122              | 43           | 23           |
| 12      | F/54    | II    | 169              | 36           | 23           |
| 13      | F/59    | II    | 173              | 32           | 28           |
| 14      | M/70    | II    | 182              | 23           | 27           |
| 15      | F/78    | II    | 527              | 36           | 46           |
| 16      | M/54    | II    | 2 870            | 48           | 26           |
| 17      | M/14    | III   | 19               | 47           | 22           |
| 18      | M/64    | III   | 380              | 18           | 26           |
| 19      | M/35    | III   | 1 140            | 40           | 24           |
| 20      | F/84    | IV    | 180              | 27           | 25           |
| 21      | F/73    | IV    | 1 160            | <sup>a</sup> | <sup>a</sup> |
| 22      | M/54    | V     | 327              | 57           | 12           |

<sup>a</sup> Not performed.

<sup>b</sup> Normal values 30–500 Units. One Unit corresponds to approximately 2 µg/l.

transfer factor as an additional therapeutic agent when he did not respond to conventional treatment with topical nitrogen mustard, methotrexate, X-rays and grenz rays. Following transfer factor, he went into complete remission, which has so far lasted 8 months.

Although it is far from proved that transfer factor should be added to our list of therapeutic agents in mycosis fungoides, the good clinical response in our patient, together with the results of the present investigation, should encourage further studies with transfer factor in this disease. Transfer factor confers immunological reactivity on T-cells (7). It must also be decided whether or not the reduced number of circulating T-cells is a consequence of the treatment, a complication of the illness, or a primary defect leading to progressive disease.

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Received March 6, 1975

H. Zachariae, M.D.  
Department of Dermatology  
Marselisborg Hospital  
Skanderborgvej 9  
DK-8000 Aarhus  
Denmark