interphase. The action site of this effect is again the microtubules, as recent investigations have shown (7). Microtubules are built up of a protein polymer, which is synthesized during the interphase, and can be demonstrated by electron microscopy. Colchicine reacts with the monomers of the microtubule protein, which are in equilibrium with the polymer; ultrastructurally no microtubules are demonstrable (7). The uptake of ^{3}H-labelled colchicine into lymphocytes, however, does not reveal any difference between CLL lymphocytes and normal lymphocytes (7).

Besides the destruction of microtubules, CLL lymphocytes exhibit damaged mitochondriae and plasma membrane following colchicine incubation (7).

The colchicine sensitivity index of lymphocytes from chronic reactive inflammatory dermatoses is most frequently found between 20 and 30, whereas the index of lymphocytes from reactive lymph node hyperplasia never exeeds 20 (3). This is probably due to the greater damage during isolation of the lymphocytes from skin connective tissue. At present we are trying to develop techniques for a more rapid but gentler isolation of lymphocytes from dermal infiltrates.

The colchicine sensitivity index is a parameter which should be determined in special cases for judgement of the dignity of a dermal infiltrate; this is also illustrated by the low index in cutaneous pseudolymphoma (lymphadenosis benigna cutis). Further studies will show whether the colchicine sensitivity index can be used to check therapeutic measures or to elicit information on the prognostic characteristics in cutaneous malignant lymphomas.

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Pityriasis Lichenoides, an Immune Complex Disease?

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Abstract. Nine biopsies from skin lesions of 5 patients with pityriasis lichenoides acuta and three biopsies from skin lesions of 3 patients with pityriasis lichenoides chronica were examined by means of the direct immunofluorescence technique. IgM deposits along the dermo-epidermal junction were found in only two biopsies. In the majority of biopsies, complement (C_3) deposits were found along the dermo-epidermal junction and in the vessel walls. Immunoglobulin and C_3 deposits were not found concomitantly in the vessel walls.

Key words: Pityriasis lichenoides; Immunofluorescence technique

Data on immunofluorescence studies in patients with pityriasis lichenoides (PL) are still sparse, and are rather contradictory.

Recently, Clayton et al. (2) and Clayton & Haffenden (3) described the presence of IgM and C_3 along the dermal–epidermal junction (DEJ) of skin lesions and the presence of immune complexes in the circulation of patients with PL. On the basis of these findings the authors propose to consider PL as an immune complex disease.

Table 1. *Direct immunofluorescence studies on biopsies from skin lesions of patients with pityriasis lichenoides*

DEJ = dermo-epidermal junction. VW = vessel walls

	IgM		C_3		IgM plus C_3		IgG		IgA, IgD, IgE		Fibrinogen	
	DEJ	VW	DEJ	VW	DEJ	VW	DEJ	VW	DEJ	VW	DEJ	VW
Pityriasis lichenoides chronica (No. of patients: 3; no. of biopsies: 3)	1	0	2	1	1	0	0	0	0	0	0	0
Pityriasis lichenoides acuta (No. of patients: 5; no. of biopsies: 9)	1	0	5[a]	5[a]	1	0	0	0	0	0	0	1
Total no. of biopsies: 12	2	0	7	6	2	0	0	0	0	0	0	1

[a] In 3 patients with Pityriasis lichenoides acuta, C_3 deposits were found along the dermo-epidermal junction as well as in the vessel walls.

Previously, Black & Marks (1) found no evidence of immunoglobulin or complement (C_3b) deposition in biopsies from six PL lesions. On the other hand, Hayashi (6) reported IgM and complement factors C_{1q}, C_3 and C_9 in vessel walls and along the DEJ in biopsies from skin lesions of two patients with PL acuta et varioliformis, suggesting an immune complex mediated vasculitis by classical complement activation. Thivolet et al. (9) studied twenty-one biopsies of patients with PL and found only C_3 deposition along the DEJ in one and in the vessel walls in three patients.

We undertook an immunofluorescence study of 8 patients with PL. Irrespective of the opinion that the acute and chronic form may be considered as belonging to one disease process (8) we divided the patients on clinical and histopathological grounds into acute (5) and chronic (3) PL. In 2 patients with acute PL, three biopsies were taken at different times; thus nine biopsies were available for examination.

Skin sections were incubated with FTC-labelled antisera against human IgG, IgM, IgA, IgD, IgE, C_3 (C_3b and C_3c) and fibrinogen; they were examined with an optimal fluorescence microscopy system with narrow-band epi-illumination. Furthermore, attention was paid to the possible deposition of IgD, which was found to be negative by Clayton and Haffenden (3) in the case of PI, as this has been reported to occur in cases of immune complex vasculitis (4, 7).

The results of our DIF investigations are summarized in Table 1.

In one out of 3 cases with PL chronica (no. of patients: 3; no. of biopsies: 3) we found a weakly homogeneous, partly granular deposition of IgM and C along the DEJ but no deposition of Ig and C in the vessel walls. In another case of PL chronica, only granular C deposits were found along the DEJ and in some vessel walls. In none of these cases were Ig and C found concomitantly in the vessel walls.

In the cases of PL acuta examined (5 patients, 9 biopsies) we found granular, partly homogeneous IgM deposition, together with focal granular C deposits along the DEJ in only one biopsy and a few granular IgM deposits along the DEJ in one other biopsy. Granular C deposition along the DEJ was found in altogether five biopsies, of which only focally in two. A few granular C deposits in vessel walls were present in three and were more numerous in two biopsies. In only one case was vascular fibrinogen staining observed. In none of the nine biopsies of these cases could convincing concomitant occurrence of Ig and C in vessel walls be observed.

In none of the biopsies examined in this study could deposition of IgG, IgA, IgD or IgE be demonstrated.

In eight biopsies (2 of PL chronica and 6 of PL acuta) cells, staining with various antisera, were observed in the dermis and in two biopsies also in the epidermis. These cells may represent phagocytosing cells, such as macrophages (5).

In view of our findings, we do not think that there is any firm evidence that PL is a vascular immune

complex disease. In 2 out of 8 cases (1 of PL acuta and 1 of PL chronica) IgM and C deposition were found concomitantly at the DEJ. Hence, it cannot be excluded that, during a certain stage, immune complex formation at this site might play a certain role in the disease. It might, however, be more fruitful to investigate the possibility of other reaction mechanisms in order to cast more light on the pathogenesis of PL.

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Granuloma Annulare: Histopathologic and Direct Immunofluorescent Study

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Abstract. Eighteen cases of granuloma annulare were classified histopathologically and examined by direct immunofluorescence. The three different histopathologic types of granuloma annulare were compared with the result of immunofluorescence examination. No features of leukocytoclastic vasculitis were seen. Direct immunofluorescence of granuloma annulare does not reveal any consistent diagnostic pattern. Dermal desposition of fibrin in necrobiotic areas were noted in 8 cases of 18. Blood vessel and/or basement membrane deposition of IgM and C3 was inconsistent and does not support an immune complex vasculitis. Direct immunofluorescence is useful in studying the pathogenesis of granuloma annulare. The finding of fibrin, together with the histology, suggests to us a delayed hypersensitivity reaction as the dominant pathogenic event.

Key words: Granuloma annulare; Direct immunofluorescence; Delayed hypersensitivity; Fibrin

We report here 18 cases of granuloma annulare examined by direct immunofluorescent technique and a comparison of these findings with the histologic features. The histopathology of granuloma annulare is characterized by three different patterns: 1) the mononuclear-histiocytic infiltrative type; 2) the palisading granuloma type, and 3) the epithelioid nodule type (7).

Immunofluorescence studies of granuloma annulare have reported findings of fibrin deposition corresponding to the necrobiotic areas as the dominant feature (6) as well as depositions of fibrin, C_3 and IgM in the blood vessels and along the basement membrane (2). The former have been interpreted as evidence of a delayed hypersensitivity reaction and the latter could indicate a chronic immune vasculitis as the main pathogenic event in granuloma annulare.

The present report was conducted to evaluate whether different patterns of direct immunofluorescence are associated with the different histiologic types seen in granuloma annulare.

METHOD

Histopathology. Eighteen cases of granuloma annulare seen at the Mayo Clinic between 1975 and 1979 were studied. 4 mm punch biopsy material was obtained, fixed in formalin and multiple sections stained with hematoxylin and eosin and were examined for (*a*) the type and degree of mononuclear-histiocytic infiltrate surrounding the vessels and between collagen fibers; (*b*) amount and location of necrobiosis; (*c*) formation of typical palisading granulomas; (*d*) presence of epithelioid nodules, and (*f*) features consistent with leukocytoclastic vasculitis.

Direct immunofluorescence procedure. 4 mm punch biopsy samples from corresponding sites and patients