

DEPOSITS OF IMMUNOGLOBULINS AND COMPLEMENT IN THE DERMO-EPIDERMAL JUNCTION OF PATIENTS WITH ANAPHYLACTOID PURPURA

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Abstract. Skin biopsies from 3 patients with anaphylactoid purpura examined by an immunofluorescence technique revealed deposits of immunoglobulins, complement C3, and fibrinogen in the dermo-epidermal junction and in vessel walls of clinically involved as well as uninvolved skin. The deposits in the dermo-epidermal junction are similar to those seen in the skin of patients with systemic lupus erythematosus.

Key words: Immunological deposits; Dermo-epidermal junction; Vessel walls; Skin biopsy; Anaphylactoid purpura

Anaphylactoid purpura is a syndrome characterized by purpuric skin lesions, synovial arthropathy, glomerular nephropathy, and a haemorrhagic gastroenteropathy. Other organs may be involved as well. The basic pathological lesion is a generalized vasculitis, accounting for the organ manifestations (3, 4).

The pathogenesis of this vasculitis is unknown but the demonstration of deposits of immunoglobulins and complement components in the vessel walls of the glomeruli and in the skin suggests an immune complex disease (2, 3, 5).

In this study, skin biopsies from patients suffering from anaphylactoid purpura were examined by the direct immunofluorescence technique. Deposits of immunoglobulins, complement C3, and fibrinogen were found in the vessel walls and in the dermo-epidermal junction.

MATERIAL AND METHODS

Case Reports

Patient no. 1. A 7-year-old girl had fever of 39-40°C, anorexia, vomiting, and abdominal pain for one week. The abdominal pain continued after she had become afebrile. Two weeks later she developed hematuria, a petechial rash on the buttocks and legs, but no joint pains. She was found to have erythrocyturia and minimal proteinuria, but normal blood pressure and kidney function. Several stool specimens con-

tained blood. No antinuclear antibodies could be demonstrated in the serum. A kidney biopsy showed minimal glomerulonephritis and deposits of IgA, IgG and complement in the mesangium and along the basement membranes.

Patient no. 2. An 8-year-old girl developed fever, abdominal pain, and vomiting. Laparotomy was carried out because of suspected appendicitis. The appendix was normal, however, but a mesenteric lymphadenitis was diagnosed. A few days later she passed bloody stools, and she was found to have hematuria and a petechial rash on the legs. She had minimal proteinuria, normal blood pressure, and normal kidney function. No antinuclear antibodies could be demonstrated in the serum. A kidney biopsy showed focal glomerulonephritis and deposits of IgG, IgM, IgA, and complement in the mesangium and along the basement membranes.

Patient no. 3. A 74-year-old man was admitted because of a 2 week history of non-thrombocytopenic purpura on the body, arms, and legs. He developed abdominal pain; several stool specimens contained blood, and he was found to have erythrocyturia, proteinuria, but normal blood pressure and kidney function. No antinuclear antibodies could be demonstrated in the serum. A kidney biopsy showed glomerulonephritis and glomerular deposits of IgG, IgA, and complement in the mesangium and along the basement membranes.

Skin and rectal biopsies

Skin biopsies were obtained from clinically normal skin of patients 1 and 2 at a time when the purpura had disappeared. Two skin biopsies were obtained from patient no. 3, one from a fresh purpuric lesion, one from an area with old petechiae. Also, two biopsies from clinically normal rectal mucosa were removed from patient no. 3.

Immunohistochemical staining

The biopsies were immediately frozen in liquid nitrogen, and 4-8 µm thick sections were cut in a cryostat. The sections were air-dried for 15 minutes, washed in saline for 30 minutes and incubated with one drop of diluted conjugate in a moist chamber for 30 minutes. Fluorescein isothiocyanate labelled rabbit IgG, specific for human γ , μ , and α chains, and the β -1c component of human C3 (Dako, Copenhagen) and antihuman fibrinogen (Behringwerke) were used. Blocking procedures with unconjugated antisera were included in each experiment. The preparations were examined in a Leitz Ortholux fluorescence microscope equipped for transmittent



Fig. 7. Direct immunofluorescence staining of skin biopsy showing deposits of IgM in the dermo-epidermal junction.

light illumination using an Osram HBO200 lamp as light source, a KP490 nm interference filter for primary light selection, a Tiyoda wide-angle, dark-field condensor and a 3 mm OG 530 nm glass filter as barrier filter.

RESULTS

In all four skin biopsies, deposits of immunoglobulins, complement C3 and fibrinogen were found in the basement membrane zone as well as in the vessel walls (Table I). In the basement membrane zone, deposits of IgM were seen in 3, IgA in 1, C3 in 3 and fibrinogen in 2 biopsies. The deposits were homogeneous and diffuse and very much like the

staining pattern seen in systemic lupus erythematosus. In the vessel walls, IgM was demonstrated in 2, IgA in 1, C3 in 3 and fibrinogen in 4 biopsies. The findings in the 2 biopsies from rectal mucosa were identical. IgM, IgA and fibrinogen were found in the vessel walls.

DISCUSSION

Previous immunofluorescence studies of kidney biopsies revealed deposits of immunoglobulins, complement components and fibrinogen in the capillary walls and in the mesangium of the glomeruli (2, 3, 5). Recently, a study by Baart de la Faille-Kuyper et

Table 1. Deposits of immunoglobulins, complement C3 and fibrinogen in skin and rectal mucosa from 3 patients with anaphylactoid purpura

Deposits	Patient 1		Patient 2		Patient 3				
	Skin Clinically normal		Skin Clinically normal		Skin New petechiae		Skin Older petechiae		Rectal mucosa two biopsies Vessel wall
	Vessel wall	Dermo-epiderm. junction	Vessel wall	Dermo-epiderm. junction	Vessel wall	Dermo-epiderm. junction	Vessel wall	Dermo-epiderm. junction	
IgG	—	—	—	—	—	—	—	—	—
IgM	+	—	+	+	—	+	—	+	+
IgA	+	—	—	+	—	—	—	—	+
Complement C3	+	+	+	+	+	+	—	—	—
Fibrinogen	+	—	+	—	+	+	+	+	+

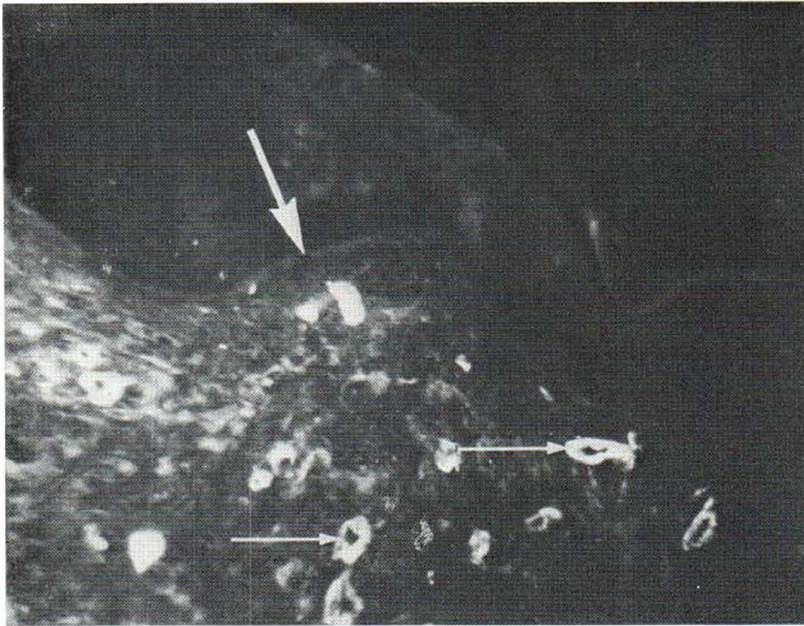


Fig. 2. Direct immunofluorescence staining of skin biopsy showing deposits of fibrinogen in vessel walls and dermo-epidermal junction.

al. (2) demonstrated deposits in the vessel walls of the skin consisting particularly of IgA, though also of IgG, IgM and complement. The vessel walls of purpuric lesions contained fibrin as well. These authors made no mention of deposits in the dermo-epidermal junction. The deposits in the dermo-epidermal junction found in our patients with anaphylactoid purpura resembled those seen in the skin of patients with systemic lupus erythematosus in

whom they have been demonstrated in skin lesions as well as in uninvolved skin (1, 8, 9).

Deposits were also found in the vessel walls of the skin and of the rectal mucosa, which stresses the generalized character of the disease. The specificity of the immunoglobulin deposited is unknown and the findings do not permit the conclusion that the immunoglobulins are deposited as antigen-antibody complexes. On the other hand, the findings resemble

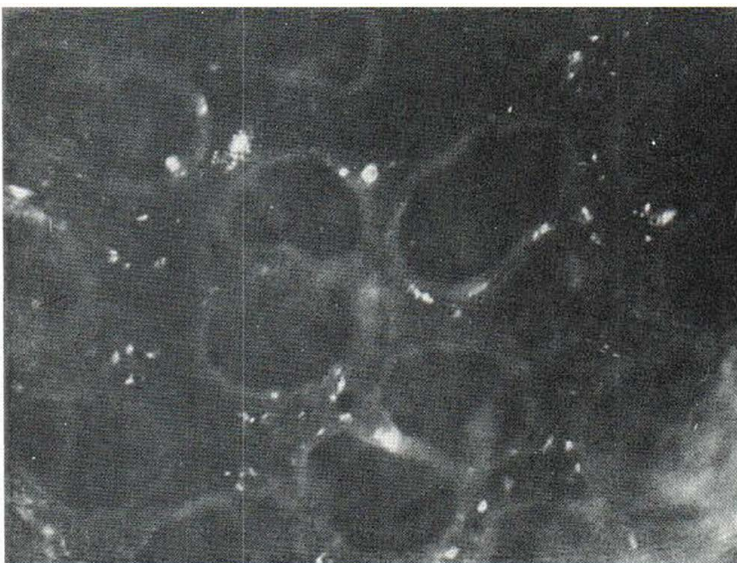


Fig. 3. Direct immunofluorescence staining of rectal biopsy showing deposits of IgM in the vessel walls.

those seen in systemic lupus erythematosus, where the antinuclear specificity of the immunoglobulins has been demonstrated (6, 7, 8) and the antigens have been identified as nuclear constituents (6).

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