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A NATURALLY OCCURRING HUMAN ANTIBODY TO LOOPS OF HENLE

P. M. FORD

Department of Medicine, Dundee University

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SUMMARY

A hitherto unreported immunofluorescent staining pattern obtained from human sera is described. Serum from six patients was found to possess specific antibody activity against lining cells of loops of Henle on the kidney of several species including man. All six patients had diseases of supposed immune aetiology, but in only one was any overt disturbance of renal function demonstrated and this patient had primary glomerular disease.

INTRODUCTION

Many autoantibodies have now been described which react with both homologous and heterologous tissues. These antibodies may be specific for a particular structure within the cell and react with cells from many different tissues, e.g. antinuclear factor, or they may react with a particular cell type only, e.g. gastric parietal cell antibodies. These latter, organ specific, antibodies are not always associated with an overt disease process in the organ system involved, for example thyroid cytoplasmic antibodies may be present in individuals with no demonstrable thyroid dysfunction.

The purpose of this communication is to report the observation of an antibody reacting with the lining cells of the loop of Henle in the kidney.

MATERIALS AND METHODS

Serum samples from 350 patients with clinical disorders of supposed immune aetiology, mostly patients with rheumatoid arthritis and from 300 patients admitted to Dundee Royal Infirmary who were suffering from diseases not thought to be associated with an abnormality of the immune response were studied.

The sera were stored at −25°C until examination using the immunofluorescent sandwich technique (Weller & Coons, 1954).

Correspondence: Dr P. M. Ford, Department of Medicine, University of Dundee, Dundee DD1 4HN, Scotland.

Tissue substrates

All sera were tested at a dilution of 1 : 10 on 5 μm air dried cryostat sections of snap-frozen composite block of rat kidney, stomach, liver and striated muscle. Sera showing the new staining pattern described below were further tested on sections of kidney from hamster, mouse, human foetus and adult humans.

Microscopy was carried out using a Reichert Zetopan microscope with u.v. light source, a B.G.12 primary filter and a Wratten GG9 secondary filter.

Photography was carried out using a Kodak High Speed Ektachrome.

F.I.T.C. conjugated antisera to human IgG and IgM were obtained from Wellcome Ltd and used at the optimum dilution.

RESULTS

Sera from six of the patients with disorders of presumed immune aetiology showed a similar staining pattern in renal tissue. All the control group were negative for this pattern.

The renal elements stained appeared to be the cells lining the loop of Henle (Fig. 1).

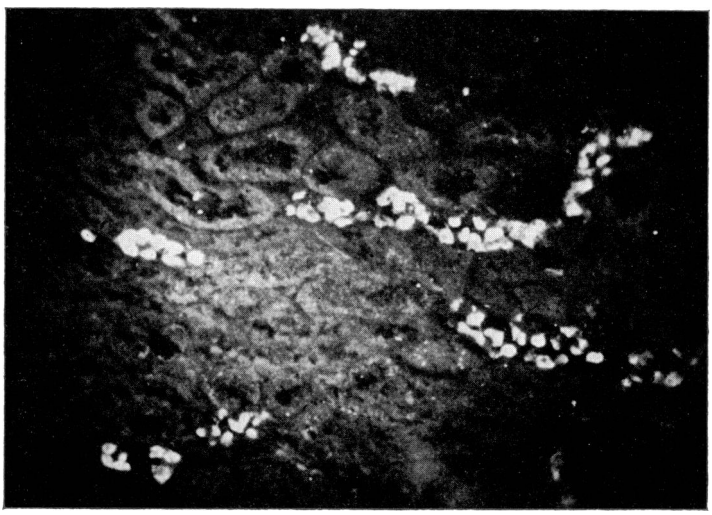

FIG. 1. Staining pattern in renal cortex (rat kidney) (× 80).

Examination under high power showed a granular staining pattern (Fig. 2) involving the cytoplasm only. This pattern is closely similar to that seen in cytoplasm stained with anti-mitochondrial antibody and it may represent a specific staining of the mitochondria in the loop of Henle lining cells.

Clinical diagnosis of these patients and associated immunofluorescent staining patterns are shown in Table 1.

No mitochondrial antibody staining pattern was seen in association, but the overall staining of the kidney seen in such cases would include the loops of Henle and render distinction impossible.

Titres of antibody in the positive sera and the immunoglobulin type are shown in Table 2.

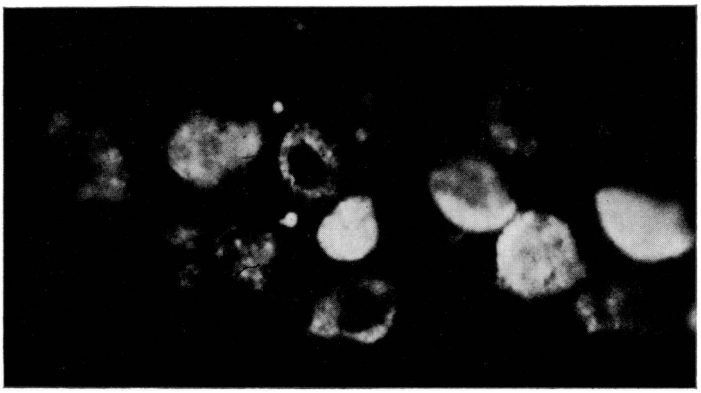

FIG. 2. High power of the loop of Henle lining cells showing granular staining of the cytoplasm (rat kidney) (×475).

TABLE 1. Clinical diagnosis and associated staining patterns in patients showing staining of loops of Henle. All sera tested at a dilution of 1 : 10

Case No.	Age	Diagnosis	A.N.F.	G.P.C.	S.M.	St.M.
1	57	Discoid lupus erythematosis	Weak +	−	−	−
2	38	Rheumatoid arthritis	−	−	−	−
3	11	Nephrotic syndrome	−	−	−	−
4	38	Ocular myasthenia	−	−	−	−
5	48	Erythema nodosum	+	−	+	−
6	44	Rheumatoid arthritis	−	+	−	−

A.N.F. = Antinuclear factor. G.P.C. = Gastric parietal cells. S.M. = Smooth muscle. St.M. = Striated muscle.

TABLE 2. Maximum titre at which staining was visible

Case No.	IgG titre	IgM titre
1	1:30	—
2	1:120	Weak 1:10
3	1:60	—
4	1:1280	—
5	1:60	—
6	1:120	—

Positive sera all showed a similar staining pattern when tested on sections of kidney from hamster, mouse, rabbit, human foetus and adult humans.

Other than patient number 3 who proved to have a proliferative glomerulonephritis no obvious disturbance of renal function was noted, although specific tests of the ability to cope with water deprivation were not performed. A renal biopsy from case 3 showed the histological abnormalities to be confined to the glomeruli.

It is perhaps worth noting that cases 5 and 6 had evidence of long standing mitral valve disease with no clear history of rheumatic fever. No drug therapy common to all six was noted, indeed three patients were on no therapy at the time blood samples were taken.

DISCUSSION

The staining pattern observed in six patients with disorders commonly assumed to involve an abnormality of the immune response, would appear to represent an antibody reacting specifically with the lining cells of the loop of Henle. Microscopy would also suggest that the activity is directed against the mitochondria of these cells.

This antibody does not appear to cause any obvious disturbance of renal function and in the one case biopsied (case 3), no histological evidence of any damage to the loops of Henle was seen.

The significance of this observation is not immediately obvious. It would seem unlikely that the antibody arises as a result of a specific lesion of the loop cells since no dysfunction of this system is demonstrable. It is possible therefore that this autoantibody may arise due to viral infection or drug hypersensitivity and cross-react with constituents of loop of Henle cells.

A larger number of patients possessing this antibody will have to be discovered before any aetiological conclusions or clinical significance may be established.

ACKNOWLEDGMENTS

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