CLINICO-PATHOLOGICAL OBSERVATION OF MEMBRANOUS NEPHROPATHY

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The widespread use of ultrastructural studies in renal biopsy specimens has rapidly increased the number of reported lesion and complexity of terminology. We now think in terms of specific underlying lesion whereas previously quite separate renal disease were grouped together under broad headings such as ‘chronic glomerulonephritis with nephrotic syndrome’. Histological and immunohistological analysis of biopsy specimens is useful not only in the immediate clinical management of the individual patient, but has also made an immense contribution to our understanding of the pathogenesis and natural history of renal disease. This in turn enables us to give a much more accurate prognosis in many cases.

This paper is based on a clinico-pathological study of patients with membranous nephropathy. Pathological changes in glomerulus of these membranous nephropathy has been extensively studies by means of light-microscopic, electron-microscopic and immuno-histological investigation.

(1) Clinical Observation of Membranous Nephropathy

In cases of membranous nephropathy, of which diagnosis were made by means of renal biopsy, there are no sex difference and a majority of the patients age is between 14 and 63 years old. The onset of the disease is slow, insidious, not at all dramatic, as with other renal disease, and usually starts with proteinuria, or it may start the nephrotic syndrome.

The important thought is that the disease is progressing very slowly, apparently with or without treatment. It usually does not or rarely respond to steroid’s therapy, but in any event the disease progresses very slowly. The patient continues to have function are not impeded, however, full-blown stage or end stage, some patients
do go into a stage of apparent deterioration with hypertension and elevation of BUN, sings of renal insufficiency.

Membranous nephropathy is impossible to be ruled out of Ellis type II glomerulonephritis as far as clinical feature are concerned. Therefore, histological investigation is indispensable in order to make a diagnosis of the disease.

(II) Histological and Immunological Observation of Membranous Nephropathy

In the very early stage, the histological feature of the disease is similar to that of lipoid nephrosis (nil disease or glomerulonephrosis) (Fig. 1).

Fig. 1 Early stage of membranous nephropathy (PAS stain)
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Fig. 2 High magnification of glomerular basement membrane of membranous nephropathy (PAS stain)

With HE stains, the thick capillary walls show eosinophilic and homogenous structure. There is no proliferation of mesangial cells or only slight focal increase in mesangial matrix. Characteristic features of the membranous nephropathy are shown by means of PAS stains, immunohistological stains and electromicroscope. With PAS stains of thin sections, the basement membrane is peculiarly thickened. The capillary walls are not uniform and there are light and dark areas which apparently alternate with a certain irregular periodicity (Fig. 2). Under electron-microscopic observation, there are numerous deposits between epithelial cell and lamina densa (Fig. 3). The deposits are stained not same as lamina densa with periodic acid methanemine stains. From the immunohistological aspect, numerous deposits which are fluorescent positive for anti-human T-G, IGG, β,C staining are peculiar to membranous nephropathy.

In the full blown stage, alteration of the glomerulus is quite unique and has diagnostic significance, not with HE staining but certainly with PAS staining. There are a marked diffuse thickening of basement membrane and a relative regularity of the capillary lumen. Under high power observations, numerous perpendicular
Fig. 3  The Electron microscopy of the glomerular basement membrane. In the every early stage of membranous nephropathy, immune deposit are visible between epithelial cell and lamina densa.

projections are projecting from the basement membrane externally toward the epithelial cells (Fig. 4). These projections reveal the same color, as the basement

Fig. 4  Full blown stage of membranous nephropathy. The numerous projections are projecting from the basement membrane toward the epithelial cells (PAS stain)
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Fig. 5 The basement membrane thicking of the glomerular capillary wall in the blown stage of membranous nephropathy. (electron microscopy)

Fig. 6 The basement membrane thicking of the glomerular capillary wall in the end-stage of membranous nephropathy (electron microscopy)

membrane. These projections has been described as mushroom or spike like by Dr. Ehrenreich. From electron-microscopic aspect, the new formed lamina densa from the epithelial cells tends to extend to cover the deposits. Therefore, two layers of lamina densa (original and new formed basement membrane) are visible separately (Fig.5). However, as the lesions advances, new layer is incorporation with the original layer and lamina densa becomes very thick and irregular in which there are a few irregular, poorly defined deposits and seem to become incorporated into the thick basement membrane (Fig.6).
Fig. 7  The basement membrane thickening of the glomerular capillary wall in the end stage of membranous nephropathy.

In some cases, the deposits become very clear and sharply demarcated from the basement membrane (Fig. 7).

Figure 8 shows the immunohistological finding for anti-human IgE. There is

Fig. 8  The immunohistological finding for anti-human IgG of the membranous nephropathy.
intense, uniform staining with beaded appearance. Under higher power, numerous deposits which have variable size are seen in the capillary walls. Some results are obtained by anti-\textit{\Gamma}G, IgM, \textit{\Gamma}, C staining.

In conclusion, it is a characteristic feature in membranous nephropathy that numerous deposits are precipitated in the basement membrane, resulting in marked thickening of the basement membrane. These deposits are fluorescent positive, which might indicate the deposits are composed of antigen-antibody complex. Therefore, it is considered that membranous nephropathy might be distinguished from the other nephrotic glomerulonephritis.

References

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