we propose that LP activation is a major contributor to renal damage in APSGN, because MASP-1 directly activates C3 [4] and MASP-2 activates C4 [3]. Both events are followed by activation of the alternative pathway, resulting in the strong deposition of C3 break down products. In addition, lectin recognition (innate immunity) is important at the very early stage in pathogen invasion, until the antigen-antibody system (acquired immunity) awakens. Thus, the evidence of LP activation in APSGN may explain the pathogenesis of this disease.

Isao Ohsawa, Hiroyuki Ohi, Morito Endo, Takayuki Fujita, Misao Matsushita and Teizo Fujita
Department of Internal Medicine II, Nihon University School of Medicine, Tokyo, Japan
Department of Biochemistry, Fukushima Medical University School of Medicine, Fukushima, Japan

Correspondence to Isao Ohsawa, M.D., Department of Internal Medicine II, Nihon University School of Medicine, Oyaguchi-kamimachi 30-1, Itabashi-ku, Tokyo 173-8610, Japan

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High expression of erythropoietin receptor in human chronic progressive glomerulonephritis

To the Editor: In a recent issue of *Kidney International*, the expression of the erythropoietin-receptor (EPO-R) was discussed in human and rat kidneys and in several kidney cell lines [1]. However, additional studies are necessary to understand the function of this receptor *in vivo*. Since erythropoietin (EPO) is widely used in patients with renal anemia, we believe it is necessary to investigate the role of this receptor in human progressive renal diseases. Here we report new data that may help explain this open field.

We examined the expression of EPO-R by immunohistochemistry using anti-EPO-R antibody (Upstate Biotechnology, Inc., Lake Placid, New York, USA). Renal biopsy specimens from 27 patients were examined: patients with minimal change disease (MCD) ($N = 4$), IgA nephropathy (IgAN) ($N = 15$), membranoproliferative glomerulonephritis (MPGN) ($N = 3$), crescentic glomerulonephritis (CrsGN) ($N = 4$). The intensity of glomerular staining was scored using a scale of 0 to 4 as described previously [2]. In MCD, a weak immunoreactivity for EPO-R was observed in glomerular endothelial cells and on the luminal side of distal tubules (Fig. 1A). In contrast, immunoreactivity was high in glomerular endothelial cells, mesangial cells and tubulointerstitial lesions in IgAN, MPGN, and CrsGN. A significantly high glomerular staining score was noted in IgAN (2.3 ± 0.4; Fig. 1B), CrsGN (2.9 ± 0.4), MPGN (3.0 ± 0.4) compared to those of MCD (1.1 ± 0.4).

The exact mechanism for the high expression of EPO-R is not clear at present. Westenfelder et al [1]

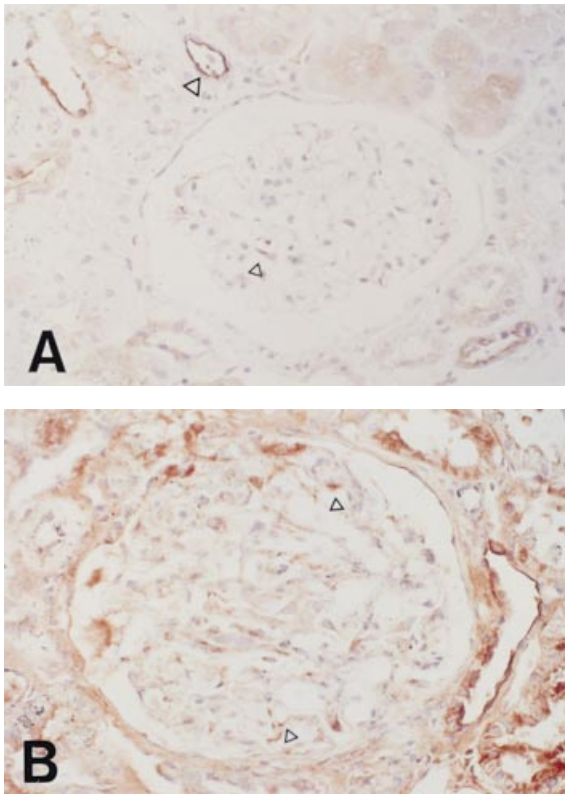

Fig. 1. Immunohistological staining of EPO-R in MCD and IgAN. (*A*) Small arrowhead shows weak immunoreactivity in glomerular endothelial cells in MCD. Arrowhead shows immunoreactivity at the luminal side of distal nodules. Some proximal tubules also showed diffuse weak positive staining. (*B*) Increased immunoreactivity was observed in glomerular endothelial cells (arrowheads). The tubulointerstitial area demonstrates strong immunoreactivity for EPO-R in IgAN.

found a proliferative effect of EPO-R in cultured tubular cells. Furthermore, using EPO-dependent human leukemia cell line UT-7, Komatsu et al [3] found that the expression of the EPO-R gene is dependent on cell cycle; these authors reported a low level of EPO-R mRNA expression at the G0/G1 phase but overexpression at the S and G2/M phases. Considered together, the above findings suggest that EPO may act as a growth-promoting factor. Because a high expression of EPO-R was noted in chronic progressive renal disease in our study, EPO should be used with caution, particularly in progressive renal disease.

Naoki Ikegaya, Akira Hishida, and Tatsuo Yamamoto
First Department of Medicine, Hamamatsu University School of Medicine and Division of Nephrology, Seirei Hamamatsu General Hospital, Hamamatsu, Japan

Correspondence to Naoki Ikegaya, M.D., First Department of Medicine, Hamamatsu University School of Medicine, 3600 Handa-cho, Hamamatsu, 431-3192, Japan

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