Complement Regulatory Proteins in Kidneys of Patients with Anti-neutrophil Cytoplasmic Antibody associated Vasculitis

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OBJECTIVES

The complement activation were involved in the development of anti-neutrophil cytoplasmic antibody (ANCA) associated vasculitis (AAV). However, the role of complement regulatory proteins (CRPs) in human AAV have not been extensively explored. So the study aimed to investigate the expression of CRPs (CD46, CD55, and CD59) in kidneys of AVV patients.

METHODS

Renal biopsy specimens of 51 AAV patients were collected from West China Hospital of Sichuan University during Jan 2010 to Jun 2015. The expression of CD46, CD55 and CD59 in kidneys was detected by immunohistochemistry and their relationships with clinical parameters were further analyzed. Double immunofluorescence staining was performed to detect the expression of the three CRPs on various kinds of glomerular intrinsic cells.

RESULTS

The immunohistochemical examination revealed that expression of CD46, CD55, and CD59 in kidney of AAV patients was lower than that of normal controls. Among AAV patients, the expression of CD46 in glomeruli correlated inversely with the proportion of normal glomeruli, while correlated with tubular atrophy in renal interstitium (r= -0.305, P=0.026; r=0.330, P= 0.023, respectively). The expression of CD55 and CD59 in glomeruli correlated with the proportion of total crescents (r=0.384, P=0.006; r=0.351, P=0.011, respectively). CD59 expression in AAV patients with hematuria significantly lower than that in AAV patients without hematuria (0.0062 [0.000-0.0143] versus 0.0137[0.0006-0.0267, P<0.5]). Double immunofluorescence staining indicated that the three CRPs were all expressed on endothelial cells and podocytes, and mesangial cells.

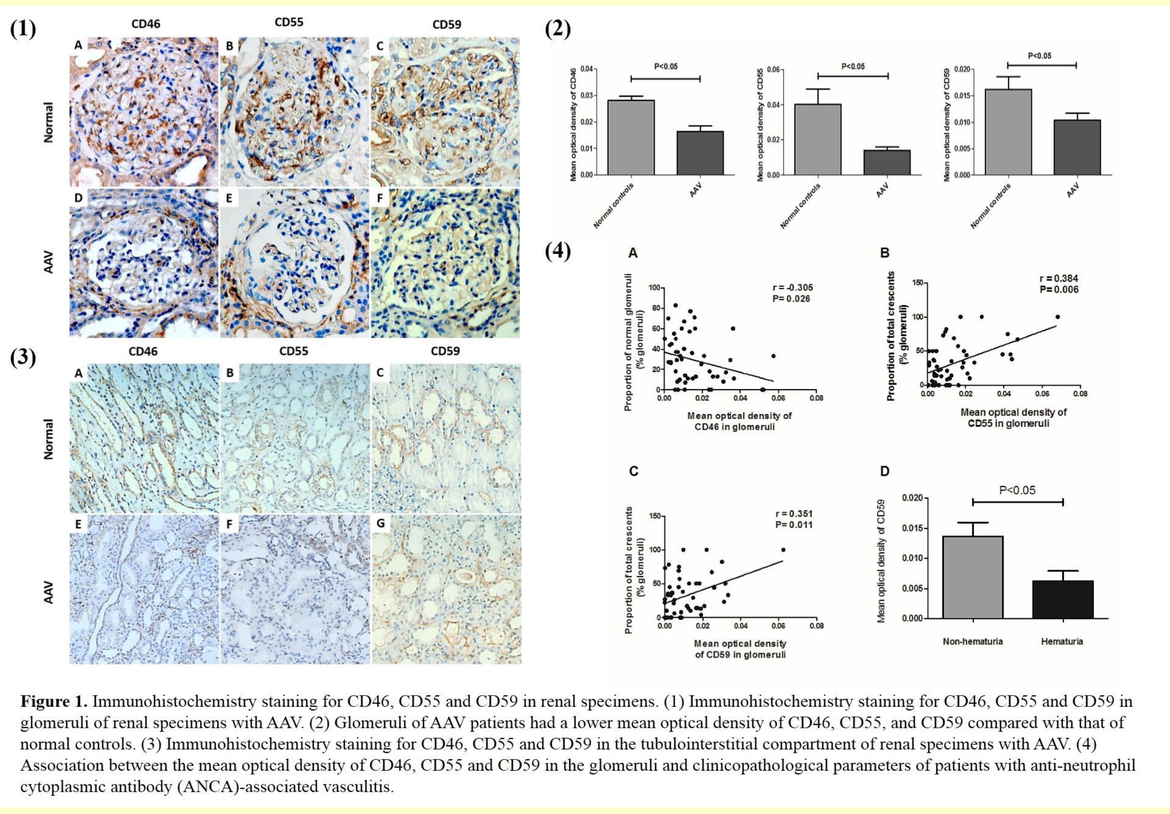

Figure 1. Immunohistochemistry staining for CD46, CD55 and CD59 in renal specimens. (1) Immunohistochemistry staining for CD46, CD55 and CD59 in glomeruli of renal specimens with AAV. (2) Glomeruli of AAV patients had a lower mean optical density of CD46, CD55, and CD59 compared with that of normal controls. (3) Immunohistochemistry staining for CD46, CD55 and CD59 in the tubulointerstitial compartment of renal specimens with AAV. (4) Association between the mean optical density of CD46, CD55 and CD59 in the glomeruli and clinicopathological parameters of patients with anti-neutrophil cytoplasmic antibody (ANCA)-associated vasculitis.

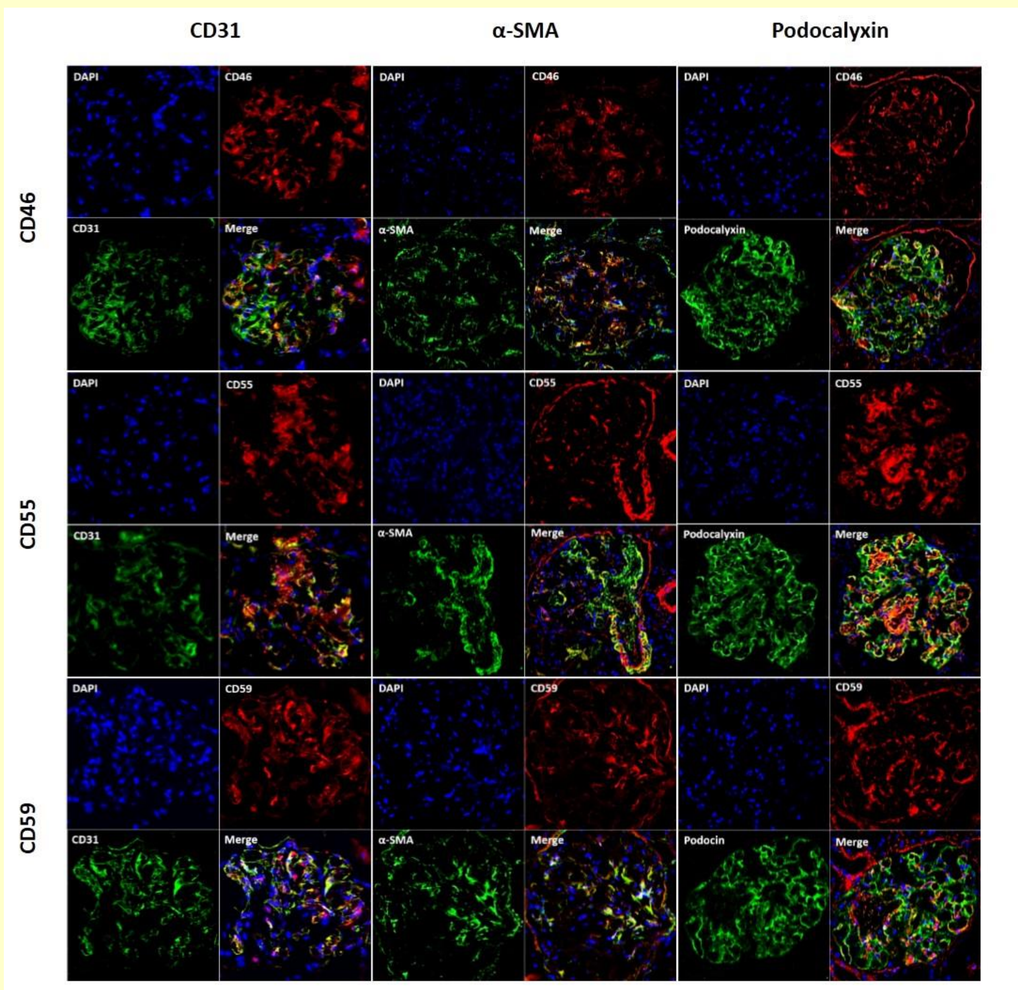

Figure 2. Double immunofluorescence staining of CD46, CD55, CD59 and markers of three glomerular intrinsic cells in renal specimens of normal controls. The specific co-staining for CD31, α-SMA, podocalyxin and the three CRPs was apparent in the merged picture as yellow/orange in glomeruli.

CONCLUSIONS

The expression levels of CD46, CD55 and CD59 were disregulated in kidneys of patients with AAV. The expression levels of CD46, CD55 and CD59 were associated with the severity of renal injury of AAV patients.

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