中文題目：ANCA 相關血管炎之腎臟切片病理學分型與臨床重要性

英文題目：Impact of Clinical Outcome with Histopathologic Patterns of Glomerulonephritis in Patients with ANCA-associated vasculitis: A Single-Center experience in Central Taiwan

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Background:

Anti-neutrophil cytoplasmic antibody (ANCA)-associated vasculitis is the most frequent cause of rapidly progressive glomerulonephritis (RPGN), and the renal biopsy is the gold standard for establishing the diagnosis. The classification of glomerular pathology can be built around four general categories of lesions: focal, crescentic, mixed, and sclerotic. This study aimed to determine the correlation between histopathologic patterns and clinical outcome.

Methods:

Between July 2005 and December 2019, we collected 42 patients with RPGN undergoing kidney biopsy and renal pathology disclosed pauci-immune crescentic GN. The pathology findings were classified according to the predominant glomerular lesion: focal, mixed, crescentic, and sclerotic, as well as assessment of interstitial fibrosis and tubular atrophy (IFTA). The enrolled patients were divided into urgent hemodialysis (HD, n= 15) and without HD (n= 27). The patient survival and renal survival were analyzed according to the classification of glomerular lesions and IFTA.

Results:

There were no significant differences between patients on urgent HD and those without in terms of age and gender. Baseline estimated glomerular filtration rate (eGFR) was lower in patients on urgent HD during the hospitalization as compared with its counterpart (median [IQR]: 5.0 [4.3-6.1] versus 10.8 [7.2-25.2], $p<0.001$). Serum C-reactive protein (CRP) level was elevated in the urgent HD group (median [IQR]: 5.4 [2.2-9.7] versus 0.5 [0.2-4.2], $p= 0.047$). The percentage of pulmonary-renal syndrome as patient's initial manifestation was higher in the urgent HD group (46.7% versus 11.1%, $p= 0.02$)

Thirty-seven patients (90.2%) patients were ANCA-positive: 31 MPO-ANCA, 3

PR3-ANCA. Analysis of the histologic patterns demonstrated 10 (23.8%) patients as sclerotic, 13 (31.0%) as crescentic, 6 (14.3%) as focal and 13 (31.0%) as mixed. As expected, the ratio of globally obsolete glomerulus number divided by total glomerulus number was higher in the urgent HD group (42.1% versus 20.0%, $p=$ 0.024). Surprisingly, the ratio of cellular crescentic glomerulus divided by total glomerulus number did not differ in the urgent HD group and the counterpart group. The percentage of interstitial fibrosis and tubular atrophy (IFTA) exceeding 50% tubulointerstitium was 33.3% in the urgent dialysis group and 14.8% in the counterpart group.

Eighty percent of the patients undergoing initial urgent HD needed long-term hemodialysis while 25.9% in the counterpart group received long-term hemodialysis eventually.

Conclusions:

Higher proportion of sclerotic glomerular lesions is associated with requirement of urgent hemodialysis. Patients with ANCA-associated vasculitis who underwent urgent HD tended to receive long-term hemodialysis.

Table 1: Clinical, serologic and histologic characteristics among patients on urgent HD and those without urgent HD

	Had not received urgent dialysis (n=27)	Requiring urgent dialysis (n=15)	Total (n=42)	p value
Sex				1.000
Female	15 (55.6%)	8 (53.3%)	23 (54.8%)	
Male	12 (44.4%)	7 (46.7%)	19 (45.2%)	
Age (years)	58.2 (49.9-69.3)	61.8 (52.2-71.4)	59.5 (51.5-71.0)	0.379
BUN (mg/dl)	50.0 (33.0-77.0)	104.0 (73.0-120.0)	70.0 (46.3-100.0)	<0.001**
Creatinine (mg/dl)	4.6 (2.7-7.8)	9.4 (8.7-10.0)	7.5 (3.1-9.1)	<0.001**
eGFR (ml/min/1.73m^2)	10.8 (7.2-25.2)	5.0 (4.3-6.1)	7.4 (5.3-21.1)	<0.001**
Urine protein-to-creatinine ratio (mg/mg)	1.5 (0.8-3.3)	1.4 (0.7-6.0)	1.5 (0.7-3.3)	0.802
Microscopic hematuria				0.538
Negative	3 (11.5%)	0 (0.0%)	3 (7.7%)	
Positive	23 (88.5%)	13 (100.0%)	36 (92.3%)	
CRP (mg/dl)	0.5 (0.2-4.2)	5.4 (2.2-9.7)	3.0 (0.2-8.7)	0.047*
Pulmonary-Renal Syndrome				0.020*
Negative	24 (88.9%)	8 (53.3%)	32 (76.2%)	
Positive	3 (11.1%)	7 (46.7%)	10 (23.8%)	
HD				0.002**
Without long-term HD	20 (74.1%)	3 (20.0%)	23 (54.8%)	
Long-term HD	7 (25.9%)	12 (80.0%)	19 (45.2%)	
Mortality	4 (14.8%)	5 (33.3%)	9 (21.4%)	0.242
ANCA				1.000
Negative	3 (11.5%)	1 (6.7%)	4 (9.8%)	
Positive	23 (88.5%)	14 (93.3%)	37 (90.2%)	
MPO				0.450
Negative	6 (25.0%)	2 (13.3%)	8 (20.5%)	
Positive	18 (75.0%)	13 (86.7%)	31 (79.5%)	
Sclerotic	4 (14.8%)	6 (40.0%)	10 (23.8%)	0.128
S_g/total	20.0% (5.6%-38.5%)	42.1% (33.3%-70.0%)	30.2% (8.9%-46.6%)	0.024*
Crescentic	9 (33.3%)	4 (26.7%)	13 (31.0%)	0.739
C_c/total	29.4% (7.7%-50.0%)	33.3% (6.7%-55.5%)	31.4% (7.7%-51.4%)	0.906
Focal	6 (22.2%)	0 (0.0%)	6 (14.3%)	0.073
Mixed	8 (29.6%)	5 (33.3%)	13 (31.0%)	1.000
IFTA				0.242
<50%	23 (85.2%)	10 (66.7%)	33 (78.6%)	
≥ 50%	4 (14.8%)	5 (33.3%)	9 (21.4%)	

Chi-square test. †Mann-Whitney U test, Median (IQR). *p<0.05, **p<0.01

S_g/total: globally obsolete glomeruli/ total glomerular number, C_c/total: cellular crescentic glomeruli/ total glomeruli, IFTA: interstital fibrosis and tubular atrophy