**Supplementary table 1. Comparisons of clinical features between patients of remission and those of no remission.**

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters | Remission (n=208) | No remission (n=133) | P |
| Gender (male/female) | 111/97 | 80/53 | 0.219 |
| Age (years) | 53.0 (44.3, 63.0) | 52.0 (43.0, 60.0) | 0.383 |
| Proteinuria (g/d) | 3.5 (2.1, 6.2) | 4.8 (3.0, 8.6) | **<0.001** |
| Albumin (g/L) | 28.0 (23.7, 32.6) | 26.8 (21.7, 30.5) | **0.019** |
| Serum creatinine (μmol/L) | 65.5 (52.6, 79.6) | 66.1 (57.2, 83.0) | 0.200 |
| eGFR (ml/min/1.73m2) | 114.8 (92.8, 147.2) | 111.4 (89.6, 140.5) | 0.351 |
| Anti-PLA2R positivity (IFA), n (%) | 118 (56.7) | 104 (78.2) | **<0.001** |
| Level of anti-PLA2R Ab (U/ml) | 20.9 (0.0, 105.2) | 57.0 (3.9, 173.4) | **<0.001** |
| Churg’s stages (I/II/III) |  |  | 0.218 |
| I | 102 (49.0%) | 55 (41.4%) |  |
| II | 89 (42.8%) | 67 (50.4%) |  |
| III | 18 (8.2%) | 11 (8.3%) |  |
| IF IgG (+) n, % | 177 (85.1) | 111 (83.5) | 0.684 |
| IF IgA (+) n, % | 55 (26.4) | 46 (34.6) | 0.109 |
| IF IgM (+) n, % | 90 (43.3) | 61 (45.9) | 0.638 |
| IF C3 (+) n, % | 192 (92.3) | 125 (94.0) | 0.555 |
| IF C1q (+) n, % | 80 (38.5) | 67 (50.4) | **0.030** |

**Supplementary table 2. Comparisons of clinical features between patients of spontaneous remission and those of remission after immunosuppressive therapy.**

|  |  |  |  |
| --- | --- | --- | --- |
| Parameters | Spontaneous remission (n=70) | Remission after immunosuppressive treatments (n=123) | P |
| Gender (male/female) | 32/38 | 70/53 | 0.135 |
| Age (years) | 51.5 (36.7, 59.3) | 56.0 (46.0, 65.0) | **0.036** |
| Proteinuria (g/d) | 2.4 (1.2, 3.8) | 4.8 (2.8, 7.9) | **<0.001** |
| Albumin (g/L) | 31.5 (28.6, 34.9) | 25.2 (21.4, 29.3) | **<0.001** |
| Serum creatinine (μmol/L) | 56.7 (50.0, 75.3) | 68.7 (54.4, 82.4) | **0.004** |
| eGFR (ml/min/1.73m2) | 127.9 (101.3, 154.8) | 108.7 (88.0, 135.3) | **0.003** |
| Anti-PLA2R positivity (IFA), n (%) | 33 (47.1) | 80 (65.0) | **0.016** |
| Level of anti-PLA2R Ab (U/ml) | 3.9 (0.0, 56.2) | 42.0 (2.4, 135.7) | **0.009** |
| Churg’s stages (I/II/III) |  |  | 0.833 |
| I | 35 (50.0%) | 62 (50.4%) |  |
| II | 31 (44.3%) | 49 (39.8%) |  |
| III | 4 (5.7%) | 12 (9.8%) |  |
| IF IgG (+) n, % | 56 (80.0) | 112 (91.1) | **0.028** |
| IF IgA (+) n, % | 18 (25.7) | 31 (25.2) | 0.938 |
| IF IgM (+) n, % | 34 (48.6) | 49 (39.8) | 0.240 |
| IF C3 (+) n, % | 61 (87.1) | 117 (95.1) | **0.047** |
| IF C1q (+) n, % | 25 (35.7) | 49 (39.8) | 0.572 |

**Supplementary table 3. Logistics regression analysis for the risk factors of treatment responses in the subgroup of patients with PLA2R-associated MN (n=248).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| OR (95% CI) | P Value | OR (95% CI) | P Value |
| *For no remission* | | | | |
| Gender (male) | 0.59 (0.34-1.02) | 0.057 | - | - |
| Age (years) | 0.99 (0.98-1.02) | 0.809 | - | - |
| Anti-PLA2R Abs positivity (IFA) | 3.23 (0.88-11.93) | 0.078 | - | - |
| Level of anti-PLA2R Ab (U/ml) | 1.002 (1.000-1.004) | **0.032** | 1.002 (1.000-1.004) | **0.041** |
| Proteinuria(g/24h) | 1.10 (1.03-1.17) | **0.007** | 1.07 (0.99-1.16) | 0.113 |
| Albumin(g/L) | 0.95 (0.90-0.99) | **0.018** | 0.97 (0.92-1.03) | 0.371 |
| eGFR(ml/min/1.73m2) | 0.998 (0.991-1.005) | 0.630 | - | - |
| Churg’s stages | 1.05 (0.70-1.59) | 0.812 | - | - |
| *For no spontaneous remission* | | | | |
| Gender (male) | 0.62 (0.34-1.14) | 0.126 | - | - |
| Age (years) | 1.024 (1.002-1.048) | **0.034** | 1.02 (1.00-1.05) | 0.099 |
| Anti-PLA2R Abs positivity (IFA) | 4.09 (1.37-12.23) | **0.012** | 1.40 (0.37-5.34) | 0.621 |
| Level of anti-PLA2R Ab (U/ml) | 1.001 (0.999-1.003) | 0.432 | - | - |
| Proteinuria (g/24h) | 1.53 (1.30-1.81) | **<0.001** | 1.37 (1.15-1.64) | **0.001** |
| Albumin (g/L) | 0.86 (0.81-0.91) | **<0.001** | 0.92 (0.86-0.99) | **0.021** |
| eGFR (ml/min/1.73m2) | 0.991 (0.983-0.999) | **0.031** | 1.000 (0.989-1.011) | 0.992 |
| Churg’s stages | 1.11 (0.68-1.79) | 0.681 | - | - |

**Supplementary table 4. Cox regression analysis for the risk factors of renal dysfunction in the subgroup of patients with PLA2R-associated MN (n=248).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| HR (95% CI) | P Value | HR (95% CI) | P Value |
| Gender | 1.72 (1.01-2.95) | **0.047** | 1.68 (0.97-2.90) | 0.064 |
| Age (years) | 1.03 (1.01-1.06) | **0.007** | 1.03 (1.00-1.05) | **0.027** |
| Anti-PLA2R Abs positivity (IFA) | 21.76 (0.01-39715.84) | 0.422 | - | - |
| Level of anti-PLA2R Ab (U/ml) | 1.002 (1.001-1.003) | **0.006** | 1.002 (1.001-1.003) | **0.007** |
| Proteinuria(g/24h) | 0.94 (0.871.01) | 0.092 | - | **-** |
| Albumin(g/L) | 0.99 (0.95-1.04) | 0.703 | - | **-** |
| eGFR(ml/min/1.73m2) | 1.002 (0.995-1.010) | 0.546 | - | **-** |
| Churg’s stages | 0.65 (0.42-0.99) | **0.049** | 0.70 (0.46-1.08) | 0.105 |

Note: renal dysfunction defined as eGFR decreased >50% compare to baseline

**Supplementary table 5. Logistics regression analysis for the risk factors of treatment responses in the subgroup of patients with nephrotic syndrome (n=216).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| OR (95% CI) | P Value | OR (95% CI) | P Value |
| *For no remission* | | | | |
| Gender (male) | 0.78 (0.43-1.41) | 0.411 | - | - |
| Age (years) | 0.99 (0.97-1.01) | 0.318 | - | - |
| Anti-PLA2R Abs positivity (IFA) | 2.80 (1.41- 5.55) | **0.003** | 2.72 (1.34-5.53) | **0.006** |
| Level of anti-PLA2R Ab (U/ml) | 1.002 (1.000-1.004) | **0.027** | 1.003 (1.000-1.005) | **0.019** |
| Proteinuria(g/24h) | 1.08 (1.01-1.16) | **0.023** | 1.08 (1.01-1.16) | 0.032 |
| Albumin(g/L) | 1.01 (0.96-1.07) | 0.731 | - | - |
| eGFR(ml/min/1.73m2) | 1.003 (0.995-1.010) | 0.507 | - | - |
| Churg’s stages | 1.21 (0.79-1.87) | 0.385 | - | - |
| *For no spontaneous remission* | | | | |
| Gender (male) | 0.79 (0.34-1.86) | 0.592 | - | - |
| Age (years) | 1.01 (0.97-1.04) | 0.696 | - | - |
| Anti-PLA2R Abs positivity (IFA) | 1.59 (0.66-3.82) | 0.303 | - | - |
| Level of anti-PLA2R Ab (U/ml) | 1.000 (0.997-1.003) | 0.941 | - | - |
| Proteinuria (g/24h) | 1.31 (1.11-1.55) | **0.001** | 1.28 (1.07-1.53) | **0.007** |
| Albumin (g/L) | 0.92 (0.85-0.99) | **0.031** | 0.96 (0.88-1.06) | 0.408 |
| eGFR (ml/min/1.73m2) | 0.999 (0.988-1.010) | 0.908 | - | - |
| Churg’s stages | 0.97 (0.51-1.84) | 0.913 | - | - |

**Supplementary table 6. Cox regression analysis for the risk factors of renal dysfunction in the subgroup of patients with nephrotic syndrome (n=216).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| HR (95% CI) | P Value | HR (95% CI) | P Value |
| Gender | 1.32 (0.70-2.50) | 0.395 | - | - |
| Age(years) | 1.019 (0.995-1.044) | 0.121 | - | **-** |
| Anti-PLA2R Abs positivity (IFA) | 2.19 (0.85-5.60) | 0.103 | - | - |
| Level of anti-PLA2R Ab (U/ml) | 1.002 (1.000-1.003) | **0.023** | - | **-** |
| Proteinuria(g/24h) | 0.92 (0.84-1.01) | 0.076 | - | **-** |
| Albumin(g/L) | 0.99 (0.93-1.06) | 0.856 | - | **-** |
| eGFR(ml/min/1.73m2) | 1.004 (0.996-1.012) | 0.351 | - | **-** |
| Churg’s stages | 0.90 (0.57-1.40) | 0.630 | - | - |

**Supplementary table 7. Logistics regression analysis for the risk factors of treatment responses in the subgroup of patients with non-nephrotic proteinuria (n=143).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| OR (95% CI) | P Value | OR (95% CI) | P Value |
| *For no remission* | | | | |
| Gender (male) | 1.02 (0.44-2.35) | 0.963 | - | - |
| Age (years) | 1.01 (0.98-1.04) | 0.561 | - | **-** |
| Anti-PLA2R Abs positivity (IFA) | 1.50 (1.03-6.05) | **0.043** | - | - |
| Level of anti-PLA2R Ab (U/ml) | 1.003 (0.999-1.007) | 0.103 | - | **-** |
| Proteinuria(g/24h) | 1.10 (0.81-1.48) | 0.548 | - | **-** |
| Albumin(g/L) | 0.94 (0.85-1.03) | 0.189 | - | **-** |
| eGFR(ml/min/1.73m2) | 0.991 (0.979-1.004) | 0.179 | - | **-** |
| Churg’s stages | 0.53 (0.24-1.16) | 0.114 | - | - |
| *For no spontaneous remission* | | | | |
| Gender (male) | 1.02 (0.52-1.97) | 0.962 | - | - |
| Age (years) | 1.02 (0.99-1.05) | 0.128 | - | **-** |
| Anti-PLA2R Abs positivity (IFA) | 2.41 (1.23-4.73) | **0.010** | 1.90 (0.94-3.86) | 0.074 |
| Level of anti-PLA2R Ab (U/ml) | 1.002 (0.998-1.005) | **0.336** | 1.001 (0.997-1.005) | 0.608 |
| Proteinuria (g/24h) | 1.36 (1.04-1.77) | **0.025** | 1.30 (0.99-1.69) | 0.058 |
| Albumin (g/L) | 0.90 (0.82-0.97) | **0.009** | 0.90 (0.83-0.98) | **0.020** |
| eGFR (ml/min/1.73m2) | 0.99 (0.98-1.00) | 0.056 | - | - |
| Churg’s stages | 0.98 (0.57-1.69) | 0.932 | - | - |

**Supplementary table 8. Cox regression analysis for the risk factors of renal dysfunction in the subgroup of patients with non-nephrotic proteinuria (n=143).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| HR (95% CI) | P Value | HR (95% CI) | P Value |
| Gender | 2.72 (1.15-6.41) | **0.023** | 2.46 (1.04-5.81) | **0.041** |
| Age(years) | 1.03 (0.99-1.06) | 0.132 | - | - |
| Anti-PLA2R Abs positivity (IFA) | 2.64 (1.16-6.01) | **0.021** | 2.33 (1.02-5.33) | **0.045** |
| Level of anti-PLA2R Ab (U/ml) | 1.006 (1.003-1.010) | **<0.001** | 1.006 (1.003-1.009) | **0.001** |
| Proteinuria(g/24h) | 1.05 (0.79-1.41) | 0.736 | - | **-** |
| Albumin(g/L) | 0.97 (0.89-1.07) | 0.572 | - | **-** |
| eGFR(ml/min/1.73m2) | 1.001 (0.989-1.012) | 0.900 | - | **-** |
| Churg’s stages | 0.68 (0.35-1.30) | 0.242 | - | **-** |

Note: renal dysfunction defined as eGFR decreased >50% compare to baseline

**Supplementary table 9. Logistics regression analysis for the risk factors of treatment responses in the subgroup of patients with nephrotic syndrome and lacking previous treatments (n=173).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| OR (95% CI) | P Value | OR (95% CI) | P Value |
| *For no remission* | | | | |
| Gender (male) | 1.04 (0.43-2.54) | 0.925 | - | - |
| Age (years) | 1.02 (0.98-1.05) | 0.411 | - | **-** |
| Anti-PLA2R Abs positivity (IFA) | 2.05 (0.82-5.12) | 0.123 | - | - |
| Level of anti-PLA2R Ab (U/ml) | 1.004 (1.000-1.008) | 0.064 | - | **-** |
| Proteinuria(g/24h) | 1.18 (0.86-1.61) | 0.303 | - | **-** |
| Albumin(g/L) | 0.93 (0.84-1.03) | 0.140 | - | **-** |
| eGFR(ml/min/1.73m2) | 0.99 (0.97-1.00) | 0.054 | - | **-** |
| Churg’s stages | 0.47 (0.20-1.10) | 0.083 | - | - |
| *For no spontaneous remission* | | | | |
| Gender (male) | 1.23 (0.60-2.50) | 0.571 | - | - |
| Age (years) | 1.03 (1.00-1.06) | **0.044** | 1.03 (1.00-1.06) | 0.076 |
| Anti-PLA2R Abs positivity (IFA) | 2.43 (1.19-4.99) | **0.015** | 1.79 (0.83-3.87) | 0.139 |
| Level of anti-PLA2R Ab (U/ml) | 1.002 (0.998-1.006) | 0.338 | - | - |
| Proteinuria (g/24h) | 1.44 (1.08-1.91) | **0.013** | 1.33 (0.99-1.80) | 0.059 |
| Albumin (g/L) | 0.90 (0.83-0.99) | **0.021** | 0.93 (0.85-1.02) | 0.121 |
| eGFR (ml/min/1.73m2) | 0.989 (0.977-1.000) | 0.054 | - | - |
| Churg’s stages | 0.91 (0.51-1.62) | 0.738 | - | - |

**Supplementary table 10. Cox regression analysis for the risk factors of renal dysfunction in the subgroup of patients with nephrotic syndrome and lacking previous treatments (n=173).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Univariate Analysis | | Multivariate Analysis | |
| HR (95% CI) | P Value | HR (95% CI) | P Value |
| Gender | 2.90 (1.16-7.26) | **0.023** | 2.35 (0.93-5.95) | 0.070 |
| Age(years) | 1.03 (0.99-1.07) | 0.133 | - | **-** |
| Anti-PLA2R Abs positivity (IFA) | 3.10 (1.29-7.45) | **0.012** | 2.62 (1.08-6.35) | **0.033** |
| Level of anti-PLA2R Ab (U/ml) | 1.006 (1.003-1.010) | **<0.001** | 1.006 (1.002-1.009) | **0.002** |
| Proteinuria(g/24h) | 1.04 (0.77-1.41) | 0.783 | - | **-** |
| Albumin(g/L) | 0.97 (0.88-1.06) | 0.478 | - | **-** |
| eGFR(ml/min/1.73m2) | 0.998 (0.986-1.011) | 0.808 | - | **-** |
| Churg’s stages | 0.61 (0.31-1.22) | 0.160 | - | - |

Note: renal dysfunction defined as eGFR decreased >50% compare to baseline

**Supplementary figure 1. Correlations between the anti-PLA2R antibody levels and proteinuria in the subgroups of patients with PLA2R-associated MN (n=248) (A), patients with nephrotic syndrome (n=216) (B), patients with non-nephrotic proteinuria (n=143) (C), and patients with nephrotic syndrome and lacking previous treatments (n=173) (D).**