**Supplemental Material to**

**Prognostic factors in anti-glomerular basement membrane disease: a multicenter study of 119 patients**

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**Table S1. Comparison of anti-GBM patients according to ESRD status at M3** (ESRD status was categorized in 3 groups: ESRD-, ESRD+, Not evaluable [FUP < 3 months]).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ESRD-  (n = 37) | ESRD+  (n = 55) | Unavailable status  (n=27, 23%) | P-value |
| **Clinical features** |  |  |  |  |
| Age (years) | 37 [25 ; 56] | 57 [38 ; 74] | 65 [40;76] | **0.003** |
| Female (%) | 15 (41) | 31 (56) | 13 (48) | 0.35 |
| Toxics |  |  |  |  |
| Tobacco (%)\* | 20 (57) | 22 (43) | 8 (35) | 0.22 |
| Cannabis (%)\* | 3 (9) | 1 (2) | 2 (9) | 0.34 |
| Other (%) | 5 (14) | 2 (4) | 5 (19) | 0.057 |
| Comorbidities |  |  |  |  |
| Hypertension (%)\* | 11 (31) | 19 (35) | 10 (37) | 0.88 |
| Diabetes (%)\* | 3 (8) | 2 (4) | 4 (15) | 0.15 |
| Dyslipidemia (%)\* | 4 (11) | 6 (11) | 4 (15) | 0.87 |
| Time between onset and diagnosis (months, median [IQR])\* | 0.5 [0.1 ; 1.0] | 0.3 [0.1 ; 0.8] | 0.6 [0.2;1.2] | 0.32 |
| **Biological features\*** |  |  |  |  |
| ANCA positivity (%) | 8 (24) | 14 (29) | 8 (32) | 0.70 |
| Hemoglobin level (g/dl)\* | 9 [8 ; 10] | 9 [8 ; 10] | 9 [8 ; 10] | 0.70 |
| CRP (mg/L)\* | 84 [28 ; 142] | 128 [86 ; 239] | 71 [30;138] | 0.044 |
| **Renal involvement** |  |  |  |  |
| Serum creatinine (mg/dl)\* | 4.0 [1.4 ; 5.9] | 9.1 [6.4 ; 14.3] | 8.5 [5.3;11.9] | **<0.0001** |
| Proteinuria (> 0,5g/dl, %)\* | 25 (86) | 27 (96) | 20 (91) | 0.43 |
| Microscopic hematuria (%)\* | 31 (97) | 28 (100) | 22 (96) | 0.74 |
| Leukocyturia (%)\* | 16 (89) | 12 (100) | 14 (93) | 0.77 |
| Serum albumin (g/l)\* | 30 [22 ; 33] | 26 [23 ; 31] | 26 [22;29] | 0.25 |
| Renal biopsy (%)\* | 30 (83) | 50 (93) | 21 (78) |  |
| Extracapillary proliferation (%)\* | 18 (60) | 37 (74) | 14 (67) | 0.41 |
| Capsular rupture (%)\* | 6 (55) | 16 (89) | 10 (77) | 0.12 |
| Interstitial fibrosis (%)\* | 6 (56) | 20 (69) | 8 (67) | 0.64 |
| Hyaline thrombi (%)\* | 2 (10) | 7 (19) | 2 (15) | 0.69 |
| Immunofluorescence positivity (%)\* | 29 (97) | 46 (100) | 16 (100) | 0.50 |
| **Pulmonary involvement** |  |  |  |  |
| Dyspnea (%)\* | 16 (50) | 16 (30) | 10 (38) | 0.20 |
| Cough (%)\* | 19 (58) | 12 (23) | 8 (31) | **0.004** |
| Alveolar hemorrhage (%)\* | 25 (71) | 19 (36) | 10 (37) | **0.002** |
| **Therapeutic regimens** |  |  |  |  |
| Admission to intensive care (%)\* | 8 (24) | 15 (27) | 13 (48) | 0.11 |
| Mechanical ventilation (%) | 5 (62) | 2 (13) | 1 (8) | **0.015** |
| Initial hemodialysis (%)\* | 15 (44) | 53 (96) | 23 (85) | **<0.0001** |
| Plasmapheresis (%)\* | 32 (89) | 44 (80) | 21 (78) | 0.45 |
| Corticosteroid pulses (%)\* | 25 (69) | 36 (68) | 20 (74) | 0.84 |
| Cyclophosphamide (%)\* | 34 (94) | 42 (76) | 21 (78) | 0.06 |
| Rituximab (%)\* | 6 (17) | 3 (5) | 2 (7) | 0.23 |
| Other immunosuppressive agent (%)\* | 2 (6) | 2 (4) | 0 (0) | 0.69 |

\* Presence of missing values

Significant P values (<0.05) are represented in bold.

*ANCA*, antineutrophil cytoplasm antibodies; *CRP*, C reactive protein

**Table S2. Description of patients according to baseline serum creatinine level (<6.8 mg/dl vs. ≥ 6.8 mg/dl).** *(n=111, 8 patients with missing data for baseline creatinine* *level).*

|  | **Creatinine < 6.8 mg/dl** | **Creatinine ≥ 6.8 mg/dl** |
| --- | --- | --- |
| **Patients, n.** | **50** | **61** |
| **Clinical features** |  |  |
| Age (years, median [IQR]) | 53 [31 ; 72] | 57 [36 ; 74] |
| Female (%) | 28 (56) | 29 (48) |
| Ethnic group\* |  |  |
| Caucasian (%) | 38 (84) | 51 (85) |
| Other (%) | 7 (16) | 9 (15) |
| Toxics |  |  |
| Tobacco (%)\* | 21 (51) | 25 (42) |
| Cannabis (%)\* | 4 (10) | 1 (2) |
| Other (%) | 6 (12) | 6 (10) |
| Comorbidities |  |  |
| Hypertension (%)\* | 17 (35) | 21 (34) |
| Diabetes (%)\* | 5 (10) | 3 (5) |
| Dyslipidemia (%)\* | 10 (20) | 4 (7) |
| Time between onset and diagnosis (months, median [IQR]) | 0.7 [0.1 ;1.7] | 0.2 [0.1 ; 0.7] |
| Symptom leading to the medical consultation\* |  |  |
| Fatigue (%) | 13 (27) | 25 (41) |
| Fever (%) | 4 (8) | 4 (7) |
| Dyspnea (%) | 5 (10) | 6 (10) |
| Cough (%) | 6 (12) | 1 (2) |
| Hemoptysis (%) | 9 (18) | 6 (10) |
| Microscopic hematuria (%) | 3 (6) | 6 (10) |
| Biological anomaly (%) | 9 (18) | 13 (21) |
| **Biological features** |  |  |
| ANCA positivity (%)\* | 12 (25) | 18 (32) |
| Hemoglobin level (g/dl, median [IQR])\* | 9 (8;10) | 9 (8;10) |
| CRP (mg/L, median [IQR])\* | 93 (43;165) | 83 (30;158) |
| **Renal involvement** |  |  |
| Acute renal failure (%)\* | 40 (80) | 61 (100) |
| Serum creatinine (mg/dl, median [IQR])\* | 3.8 [1.5;5.7] | 11.0 [8.5;14.0] |
| Proteinuria (> 0,5g/dl, %)\* | 36 (86) | 36 (97) |
| Microscopic hematuria (%)\* | 42 (95) | 37 (100) |
| Leukocyturia (%)\* | 24 (89) | 18 (100) |
| Serum albumin (g/l, median [IQR])\* | 29 [25;33] | 25 [22;29] |
| Renal biopsy (%)\* | 40 (80) | 54 (90) |
| Extracapillary proliferation (%)\* | 22 (96) | 43 (93) |
| Capsular rupture (%)\* | 14 (70) | 17 (81) |
| Interstitial fibrosis (%)\* | 12 (55) | 24 (71) |
| Hyaline thrombi (%)\* | 2 (7) | 9 (23) |
| Immunofluorescence positivity (%)\* | 37 (97) | 48 (100) |
| **Pulmonary involvement** |  |  |
| Dyspnea (%)\* | 21 (44) | 21 (35) |
| Cough (%)\* | 23 (47) | 16 (27) |
| Overt hemoptysis (%)\* | 18 (37) | 11 (18) |
| Pulmonary interstitial opacities on chest CT (n, %)\* | 22 (56) | 18 (58) |
| Alveolar hemorrhage on bronchoalveolar lavage (n, %)\* | 14 (100) | 9 (90) |
| PaO2 (mmHg, median [IQR])\* | 78 [60;87] | 76 [61;81] |
| **Therapeutic regimens** |  |  |
| Admission to intensive care (%)\* | 15 (31) | 20 (33) |
| Mechanical ventilation (%) | 5 (33) | 3 (15) |
| Initial hemodialysis (%)\* | 26 (53) | 59 (97) |
| Plasmapheresis (%)\* | 42 (84) | 50 (82) |
| Corticosteroid pulses (%)\* | 32 (64) | 45 (75) |
| Oral corticosteroids (%)\* | 50 (100) | 59 (97) |
| Cyclophosphamide (%)\* | 44 (88) | 49 (80) |
| Rituximab (%)\* | 8 (16) | 3 (5) |
| Other immunosuppressive agent (%)\* | 3 (6) | 1 (2) |
| **ESRD status at M3** |  |  |
| ESRD- | 27 (54%) | 6 (10%) |
| ESRD+ | 14 (28%) | 38 (62%) |
| Lost-to-follow up at 3 months (%) | 9 (18) | 17 (28) |

\* Presence of missing values

**Figure S1. Kaplan Meier-estimated Overall Survival by baseline serum creatinine level (<6.8 mg/dl vs. ≥ 6.8 mg/dl).**

Overall survival (%)

0

6

12

18

24

30

36

0

20

40

60

80

100

Time (months)

No. at risk

Creat. < 6.8 mg/dl

Creat. >= 6.8 mg/dl

50

61

39

40

30

35

27

30

23

28

22

26

22

26

Creatinine < 6.8 mg/dl

Creatinine >= 6.8 mg/dl

*Log Rank P = 0.44*

At 36 months, OS was 94% (95%confidence interval: 85;100%) in patients with initial creatinine < 6.8 mg/dl and 89% (95%CI: 81;99%) in patients with initial creatinine ≥ 6.8 mg/dl.

**Table S3. Description of patients according to baseline need for dialysis (at presentation).** *(n=116, 3 patients with missing data for need for dialysis).*

| **Variables** | **No dialysis at presentation** | **Need for dialysis at presentation** |
| --- | --- | --- |
| **Patients, n. (%)** | **25** | **91** |
| **Clinical features** |  |  |
| Age (years, median [IQR]) | 36 [26 ; 52] | 58 [36 ; 75] |
| Female (%) | 10 (40) | 48 (53) |
| Ethnic group\* |  |  |
| Caucasian (%) | 19 (83) | 74 (85) |
| Other (%) | 4 (17) | 13 (14) |
| Toxics |  |  |
| Tobacco (%)\* | 13 (54) | 36 (43) |
| Cannabis (%)\* | 4 (17) | 2 (2) |
| Other (%) | 6 (12) | 6 (10) |
| Comorbidities |  |  |
| Hypertension (%)\* | 4 (16) | 35 (39) |
| Diabetes (%)\* | 1 (4) | 8 (9) |
| Dyslipidemia (%)\* | 2 (8) | 12 (13) |
| Time between onset and diagnosis (months, median [IQR]) | 0.7 [0.2 ; 2.6] | 0.3 [0.1 ; 0.9] |
| Symptom leading to the medical consultation\* |  |  |
| Fatigue (%) | 5 (20) | 33 (37) |
| Fever (%) | 1 (4) | 9 (10) |
| Dyspnea (%) | 2 (8) | 9 (10) |
| Cough (%) | 4 (16) | 3 (3) |
| Hemoptysis (%) | 7 (28) | 8 (9) |
| Microscopic hematuria (%) | 1 (4) | 8 (9) |
| Biological anomaly (%) | 5 (20) | 20 (22) |
| **Biological features** |  |  |
| ANCA positivity (%)\* | 5 (20) | 24 (30) |
| Hemoglobin level (g/dl, median [IQR])\* | 9 [7;10] | 9 [8;10] |
| CRP (mg/L, median [IQR])\* | 72 [28;127] | 96 [43;165] |
| **Renal involvement** |  |  |
| Acute renal failure (%)\* | 15 (60) | 85 (100) |
| Serum creatinine (mg/dl, median [IQR])\* | 2.1 [1.0;3.9] | 8.6 [6.1;12.1] |
| Proteinuria (> 0,5g/dl, %)\* | 19 (83) | 52 (95) |
| Microscopic hematuria (%)\* | 22 (96) | 58 (98) |
| Leukocyturia (%)\* | 13 (81) | 28 (100) |
| Serum albumin (g/l, median [IQR])\* | 31 [26;33] | 26 [22;29] |
| Renal biopsy (%)\* | 19 (76) | 81 (90) |
| Extracapillary proliferation (%)\* | 11 (92) | 58 (95) |
| Capsular rupture (%)\* | 6 (67) | 26 (79) |
| Interstitial fibrosis (%)\* | 3 (27) | 35 (73) |
| Hyaline thrombi (%)\* | 1 (7) | 10 (18) |
| Immunofluorescence positivity (%)\* | 18 (95) | 72 (100) |
| **Pulmonary involvement** |  |  |
| Dyspnea (%)\* | 11 (46) | 31 (36) |
| Cough (%)\* | 12 (48) | 27 (31) |
| Overt hemoptysis (%)\* | 13 (52) | 18 (20) |
| Pulmonary interstitial opacities on chest CT (n, %)\* | 14 (64) | 25 (53) |
| Alveolar hemorrhage on bronchoalveolar lavage (n, %)\* | 6 (100) | 16 (89) |
| PaO2 (mmHg, median [IQR])\* | 79 [69;89] | 75 [60;81] |
| **Therapeutic regimens** |  |  |
| Admission to intensive care (%)\* | 4 (16) | 32 (36) |
| Mechanical ventilation (%) | 1 (25) | 7 (22) |
| Plasmapheresis (%)\* | 21 (84) | 74 (81) |
| Corticosteroid pulses (%)\* | 16 (64) | 64 (72) |
| Oral corticosteroids (%)\* | 25 (100) | 88 (97) |
| Cyclophosphamide (%)\* | 22 (88) | 73 (80) |
| Rituximab (%)\* | 3 (12) | 8 (9) |
| Other immunosuppressive agent (%)\* | 2 (8) | 2 (2) |

\* Presence of missing values

**Figure S2. Kaplan Meier-estimated Overall Survival by baseline need for dialysis, at presentation (n=116)**



At 36 months, OS was 100% (no deqths) in patients without hemodialysis and 89% (95%CI: 82;97%) in patients who required hemodialysis at presentation.

**Table S4. Comparison of anti-GBM patients needing hemodialysis at diagnosis according to ESRD status at M3** (ESRD status was categorized in 3 groups: ESRD-, ESRD+, Not evaluable [FUP < 3 months]).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Total  (n = 91) | ESRD-  (n = 15) | ESRD+  (n = 53) | Unavailable status  (n = 23) | P-value |
| **Clinical features** |  |  |  |  |  |
| Age (years) | 58 (36;75) | 50 (28;64) | 57 (36;73) | 71 (50;76) | 0.10 |
| Female (%) | 48 (53) | 6 (40) | 31 (58) | 11 (48) | 0.41 |
| Toxics |  |  |  |  |  |
| Tobacco (%)\* | 36 (43) | 7 (50) | 22 (45) | 7 (35) | 0.64 |
| Cannabis (%)\* | 2 (2) | 0 (0) | 1 (2) | 1 (5) | 0.66 |
| Comorbidities |  |  |  |  |  |
| Hypertension (%)\* | 35 (39) | 6 (40) | 19 (37) | 10 (43) | 0.87 |
| Diabetes (%) | 8 (9) | 2 (13) | 2 (4) | 4 (17) | 0.087 |
| Dyslipidemia (%) | 12 (13) | 2 (13) | 6 (11) | 4 (17) | 0.76 |
| **Biological features\*** |  |  |  |  |  |
| ANCA positivity (%)\* | 24 (30) | 4 (29) | 13 (28) | 7 (33) | 0.94 |
| Hemoglobin level (g/dl)\* | 9 (8;10) | 9 (8;10) | 9 (8;10) | 9 (8;10) | 0.46 |
| CRP (mg/L)\* | 96 (43;165) | 98 (42;148) | 118 (85;227) | 71 (30;138) | 0.15 |
| **Renal involvement** |  |  |  |  |  |
| Serum creatinine (mg/dl)\* | 8.6 (6.1;12.1) | 6.1 (4.1;7.9) | 9.8 (6.5;14.6) | 10.3 (7.2;12.1) | **0.006** |
| Proteinuria (> 0,5g/dl, %)\* | 52 (95) | 10 (91) | 25 (96) | 17 (94) | 0.78 |
| Microscopic hematuria (%)\* | 58 (98) | 12 (100) | 28 (100) | 18 (95) | 0.53 |
| Serum albumin (g/l)\* | 26 (22;29) | 28 (22;28) | 26 (23;30) | 26 (22;27) | 0.79 |
| Renal biopsy (%)\* | 81 (90) | 14 (93) | 48 (92) | 19 (83) | 0.44 |
| Extracapillary proliferation (%) | 58 (72) | 10 (71) | 35 (73) | 13 (68) | 0.94 |
| Capsular rupture (%)\* | 26 (79) | 2 (50) | 15 (88) | 9 (75) | 0.22 |
| Interstitial fibrosis (%)\* | 35 (73) | 8 (80) | 20 (71) | 7 (70) | 0.91 |
| Hyaline thrombi (%)\* | 10 (18) | 1 (11) | 7 (19) | 2 (17) | 1 |
| Hyperrtension at diagnosis (%)\* | 42 (49) | 4 (29) | 23 (46) | 15 (71) | **0.024** |
| **Pulmonary involvement** |  |  |  |  |  |
| Dyspnea (%)\* | 31 (36) | 7 (50) | 16 (31) | 8 (36) | 0.43 |
| Cough (%)\* | 27 (31) | 8 (57) | 12 (24) | 7 (32) | 0.064 |
| Hemoptysis (%)\* | 18 (20) | 7 (47) | 9 (18) | 2 (9) | **0.019** |
| Alveolar hemorrhage (%)\* | 37 (42) | 11 (73) | 19 (37) | 7 (30) | **0.022** |
| **Therapeutic regimens** |  |  |  |  |  |
| Admission to intensive care (%)\* | 32 (36) | 4 (29) | 15 (28) | 13 (57) | 0.060 |
| Mechanical ventilation (%) | 7 (22) | 4 (100) | 2 (13) | 1 (8) | **0.001** |
| Plasmapheresis (%) | 74 (81) | 15 (100) | 42 (79) | 17 (74) | 0.097 |
| Corticosteroid pulses (%)\* | 64 (72) | 12 (80) | 35 (69) | 17 (74) | 0.77 |
| Cyclophosphamide (%) | 73 (80) | 15 (100) | 40 (75) | 18 (78) | 0.096 |
| Rituximab (%) | 8 (9) | 3 (20) | 3 (6) | 2 (9) | 0.22 |
| Other immunosuppressive agent (%) | 2 (2) | 1 (7) | 1 (2) | 0 (0) | 0.37 |

\* Presence of missing values

Significant P values (<0.05) are represented in bold.

*ANCA*, antineutrophil cytoplasm antibodies; *CRP*, C reactive protein