**Supplemental TABLE 1. Univariable Analyses of Factors Associated with a Composite Complication Endpoint for 80 Patients after in-ICU TVRBs**

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| --- | --- | --- | --- | --- | --- |
|  | | **Composite complication endpointa** | | |  |
| **Factor** | | **Yes, *n* = 36** | **No, *n* = 44** | | ***p*** |
| Age | | 47 ± 18.5 | 47.5 ± 18.2 | | 0.9 |
| Medical ICU patient | | 22 (61.1) | 27 (61.4) | | 1 |
| Pre-TVRB SOFA score | | 10 [5.2;16] | 7 [5;11.7] | | 0.1 |
| Pre-TVRB SAPS II | | 44.5 [33;66] | 38.5 [26.2;60] | | 0.1 |
| Biopsy after 2015 | | 14 (38.9) | 6 (13.6) | | 0.02 |
| AKI status | |  |  | |  |
| No AKI | | 0 (0.0) | 4 (9.1) | | 0.1 |
| Stage 1 | | 1 (2.8) | 1 (2.3) | | 1 |
| Stage 2 | | 2 (5.3) | 2 (4.5) | | 1 |
| Stage 3 | | 33 (91.7) | 37 (84.1) | | 0.5 |
| Serum creatinine, µmol/L | | 427 [314;486] | 389 [243;475] | | 0.3 |
| Proteinuria, g/gb | | 2.4 [1.1;4.0] | 2.8 [1.5;5.4] | | 0.4 |
| Hematuria, ×103 RBCs/mL | | 200 [55;1356] | 50 [13;567] | | 0.08 |
| >104 RBCs/mLc | | 26/31 (83.9) | 32/41 (78.0) | | 0.7 |
| Admission-to-TVRB interval, days | | 9 [3.2;23.7] | 6 [2;31.5] | | 0.3 |
| Number of glomeruli, n | | 15 [8;20] | 13 [7;22] | | 0.7 |
| Clinical findings on TVRB day | | | |  |  |
| SOFA score | | 6 [5;8] | 5 [4;7] | | 0.08 |
| Renal replacement therapy | | 26 (72.2) | 34 (77.3) | | 0.6 |
| Vasopressor use | | 9 (25) | 2 (4.5) | | 0.01 |
| Mechanical ventilation | | 11 (30.6) | 12 (27.3) | | 0.8 |
| Extracorporeal membrane oxygenation | | 5 (13.9) | 1 (2.3) | | 0.08 |
| Treatments on TVRB day |  | | |  |  |
| Anticoagulation | | 24 (66.7) | 35 (79.5) | | 0.2 |
| Preventive | | 13/24 (54.2) | 21/35 (60) | | 0.3 |
| Curative | | 11/24 (45.8) | 14/35 (40) | | 1 |
| Heparin, IU | | 12,000 [6,000;19,500] | 12,000 [6,750;23,000] | | 0.8 |
| Interruption | | 15/24 (62.5) | 22/35 (62.9) | | 1 |
| Antiplatelet therapy | | 8 (22.2) | 14 (31.8) | | 0.4 |
| Bleeding-risk factor(s)d | |  |  | |  |
| 0 | | 4 (11.1) | 3 (6.8) | | 0.7 |
| 1 | | 16 (44.4) | 21 (47.7) | | 0.8 |
| 2 | | 14 (38.9) | 17 (38.6) | | 1 |
| 3 | | 2 (5.6) | 3 (6.8) | | 1 |
| Laboratory findings on TVRB day | | | |  |  |
| Prothrombin time, % | | 68 [62-83] | 80 [74-87.7] | | 0.01 |
| Activated clotting time, fold | | 1.3 [1.1;1.5] | 1.2 [1.08;1.39] | | 0.2 |
| Anti-IIa activity, IU/mL | | 0 [0;0.15] | 0 [0;0.22] | | 0.3 |
| Platelets, G/L | | 137 [71;210] | 205 [122;316] | | 0.006 |
| Biopsy diagnosis |  | | |  |  |
| Acute tubular necrosis | | 11 (30.6) | 12 (27.3) | | 0.8 |
| Treatable cause | | 20 (55.6) | 27 (61.4) | | 0.6 |
| TVRB = transvenous renal biopsy; ICU = intensive care unit; SOFA = Sequential Organ-Failure Assessment; SAPS II = Simplified Acute Physiology Score II; RBCs = red blood cells; AKI, Acute Kidney, Injury.  aComposite complication endpoint: renal hematoma, macroscopic hematuria, transfusion days 1–3 post-TVRB, TVRB-day–to–day +3 post-TVRB Sequential Organ-Failure Assessment (SOFA) score increase ≥ 1 point or TVRB-day–to–day +3 hemoglobin decrease ≤ –2 g/dL.  bExpressed as gram of urine protein per gram of urine creatinine.  c*n*=72  dBleeding-risk factors: antiplatelet therapy, platelet count on biopsy-day <150 G/L, preventive or curative anticoagulation.  Continuous variables are expressed as mean ± standard deviation or median [25th;75th-percentile interquartile range (IQR)] and compared with Student’s *t*-test or Wilcoxon’s rank test; categorical variables are expressed as *n* (%) and compared with χ2 tests. | | | | | |

**Supplemental TABLE 2. Logistic-Regression Univariable and Multivariable Analyses of Factors Associated with a Composite Complication Endpoint after in-ICU TVRB**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Univariable analysis** | | |  | | | **Multivariable analysis** | | |
| **Factor** | **OR** | **95% CI** | ***p*** | |  | **OR** | | **95% CI** | ***p*** |
| TVRB-day SOFA score | 1.1 | [0.99–1.32] | 0.07 | |  |  | |  |  |
| **Vasopressor use** | 7.0 | [1.4–34.9] | 0.02 | |  | **6.8** | | **[1.2–37.4]** | **0.026** |
| Extracorporeal membrane oxygenation | 6.9 | [0.7–62.3] | 0.08 | |  |  | |  |  |
| TVRB-day prothrombin time < 75% | 3.3 | [1.3–8.4] | 0.01 | |  | 2.4 | | [0.9–6.7] | 0.078 |
| **TVRB-day platelet count < 175 G/L** | 3.5 | [1.3–8.8] | 0.008 | |  | **3.1** | | **[1.1–8.7]** | **0.026** |
| TVRB = transvenous renal biopsy; ICU = intensive care unit; OR = odds ratio; CI = confidence interval; SOFA = Sequential Organ-Failure Assessment.  The multiple logistic-regression model, including TVRB-day SOFA score, vasopressor support and extracorporeal membrane oxygenation, prothrombin time and platelet count, and using backward-stepwise variable elimination, was run (with the variable exit threshold set at *p* > 0.10). All potential explanatory variables included in the multivariable analyses were subjected to collinearity analysis with a correlation matrix. Variables associated with one another were not includedin the model. Statistical significance was defined as *p <* 0.05. | | | | | | | | | |

**Supplemental TABLE 3. Diagnostic yield and complications of TVRBs performed before/after year 2012.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **TVRB < 2012**  ***n* = 38** | **TVRB > 2012**  ***n* = 42** | ***p*** |
| Age | 49 ± 19.6 | 45.76 ± 17 | 0.4 |
| Pre-TVRB SAPS II | 46.5 [30;63.5] | 42 [27.7;61.5] | 0.6 |
| Pre-TVRB SOFA score | 7 [5 ;13] | 8 [4.7 ;11] | 0.8 |
| AKI status |  |  |  |
| No AKI | 3 (7.9) | 1 (2.4) | 0.3 |
| Stage 1 | 1 (2.6) | 1 (2.4) | 1 |
| Stage 2 | 1 (2.6) | 3 (7.1) | 0.6 |
| Stage 3 | 33 (86.8) | 37 (88.1) | 1 |
| Diagnosis | 34 (89.5) | 38 (90.5) | 1 |
| Potentially treatable causea | 24 (63.2) | 23 (54.8) | 0.5 |
| Renal hematoma | 1 (2.6) | 4/42 (9.5) | 0.4 |
| Macroscopic hematuria | 0 (0.0) | 2/42 (4.8) | 0.5 |
| Composite complication endpointb | 15 (39.5) | 21 (50.0) | 0.4 |
| In-ICU deaths | 1 (2.6) | 5 (11.9) | 0.2 |
| TVRB = transvenous renal biopsy; ICU = intensive care unit; SAPS II = Simplified Acute Physiology Score II; SOFA = Sequential Organ-Failure Assessment; AKI, Acute Kidney, Injury.  aPotentially treatable etiologies included acute glomerulopathies, acute vascular nephropathy, drug toxicity, acute interstitial nephritis and acute renal graft rejection.  bComposite complication endpoint: renal hematoma, macroscopic hematuria, transfusion during days 1–3 post-TVRB, TVRB-day–to–day +3 post-TVRB Sequential Organ-Failure Assessment (SOFA) score increase ≥ 1 point or TVRB-day–to–day +3 hemoglobin decrease ≤ –2 g/dL.  Continuous variables are expressed as mean ±standard deviation or median [25th;75th-percentile interquartile range (IQR)] and compared using Student’s *t*-test or Wilcoxon’s rank test; categorical variables are expressed as *n* (%) and compared with χ2 tests. | | | |

**Supplemental TABLE 4. Therapeutic Consequences of in-ICU TVRB**

|  |  |  |
| --- | --- | --- |
| **Consequence** | **Value** | |
| Treatment introduction | 18 (22.5) | |
| Corticosteroids | 9 (11.25) | |
| Cyclophosphamide | 6 (7.5) | |
| Plasmapheresis | 6 (7.5) | |
| Intravenous immunoglobulins | 1 (1.3) | |
| Tuberculosis treatment | 1 (1.3) | |
| Eculizumab | 1 (1.3) | |
| Treatment interruption | 11 (13.8) | |
| Calcineurin inhibitor | 4 (5) | |
| Corticosteroids | 3 (3.8) | |
| Plasmapheresis | 4 (5) | |
| Cyclophosphamide | 1 (1.3) | |
| Nonsteroidal antiinflammatory drug | 1 (1.3) | |
| Treatment continuation | 22 (27.5) | |
| Corticosteroids | 18 (22.5) | |
| Cyclophosphamide | 7 (8.8) | |
| Plasmapheresis | 7 (8.8) | |
| Curative anticoagulation | 5 (6.3) | |
| Rituximab | 1 (1.3) | |
| Intravenous immunoglobulins | 1 (1.3) | |
| Calcineurin inhibitor | 1 (1.3) | |
| Immunosuppressant(s) initiated in the ICU | |  |
| Corticosteroids | 34 (42.5) | |
| Corticosteroids pulses | 23 (28.8) | |
| Plasmapheresis | 21 (26.3) | |
| Cyclophosphamide | 12 (15) | |
| Rituximab | 2 (2.5) | |
| TVRB = transvenous renal biopsy; ICU = intensive care unit.  Categorical variables are expressed as *n* (%). | | |

**Supplemental TABLE 5. Univariable Analyses of Factors Associated with Acute Tubular Necrosis Diagnosis after in-ICU TVRB**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **Acute tubular necrosis**  ***n* = 23** | **Other diagnoses**  ***n* = 57** | ***p*** |
| **Age** | **53.8 ± 17.2** | **44.7 ± 18** | **0.04** |
| Women | 12 (52.2) | 29 (50.9) | 1 |
| Medical patient | 13 (56.5) | 36 (63.2) | 0.6 |
| Transplant patient | 7 (30.4) | 14 (24.6) | 0.6 |
| Chronic kidney disease | 7 (30.4) | 17 (29.8) | 1 |
| **Admission-to-TVRB interval, days** | **17 [8;62]** | **5 [2;17]** | **0.003** |
| In-ICU days | 41 [18;77] | 16 [7;41.5] | 0.01 |
| **Admission-to-TVRB interval/in-ICU days** | **0.56 [0.37;0.83]** | **0.37 [0.17;0.6]** | **0.028** |
| Pre-TVRB SAPS II score | 51 [32;66] | 42 [28;60] | 0.2 |
| Pre-TVRB SOFA score | 10 [8;14] | 7 [4.5;14] | 0.05 |
| Renal SOFA score ≥ 3 | 13 (56.5) | 37 (64.9) | 0.6 |
| Respiratory SOFA score ≥ 3 | 11 (47.8) | 19 (33.3) | 0.3 |
| **Cardiovascular SOFA score ≥ 3** | **13 (56.5)** | **16 (28.1)** | **0.02** |
| Neurologic SOFA score ≥ 3 | 8 (34.8) | 18 (31.6) | 0.8 |
| Hematologic SOFA score ≥ 3 | 4 (17.4) | 8 (14.0) | 0.7 |
| Liver SOFA score ≥ 3 | 3 (13.0) | 2 (3.5) | 0.1 |
| AKI status |  |  |  |
| No AKI | 0 (0.0) | 4 (7.0) | 0.3 |
| Stage 1 | 0 (0.0) | 2 (3.5) | 1 |
| Stage 2 | 0 (0.0) | 4 (7.0) | 0.3 |
| Stage 3 | 23 (100.0) | 47 (82.5) | 0.055 |
| Serum creatinine, µmol/L | 406 [344;469] | 403 [241;485] | 0.7 |
| Proteinuria, g/ga | 2.28 [0.94;3.66] | 2.68 [1.5;5] | 0.09 |
| Hematuria, ×103 RBCs/mL | 73 [15;1689] | 104 [17;641] | 0.9 |
| >104 RBCs/mLb | 16/20 (80.0) | 42/52 (80.8) | 1 |
| In-ICU organ-failure treatments |  |  |  |
| Renal replacement therapy | 20 (87) | 45 (78.9) | 0.5 |
| Mechanical ventilation | 16 (69.6) | 33 (57.9) | 0.4 |
| **Vasopressor use** | **17 (73.9)** | **27 (47.4)** | **0.046** |
| Extracorporeal membrane oxygenation | 8 (34.8) | 18 (31.6) | 0.8 |
| Organ-support treatments on TVRB day |  |  |  |
| Renal replacement therapy | 21 (91.3) | 39 (68.4) | 0.04 |
| Mechanical ventilation | 8 (34.8) | 15 (26.3) | 0.5 |
| Vasopressor use | 4 (17.4) | 7 (12.3) | 0.7 |
| Extracorporeal membrane oxygenation | 1 (4.3) | 5 (8.8) | 0.6 |
| TVRB-day SOFA score | 7 [5-9] | 5 [4-7] |  |
| Bleeding-risk factors on TVRB day |  |  |  |
| 1 risk factor | 12 (52.2) | 25 (43.9) | 0.6 |
| 2 Risk factors | 9 (39.1) | 22 (38.6) | 1 |
| 3 risk factors | 1 (4.3) | 4 (7.0) | 1 |
| Complication of TVRB |  |  |  |
| Renal hematoma | 1 (4.3) | 4 (7.0) | 1 |
| Macroscopic hematuria | 0 (0.0) | 2 (3.5) | 1 |
| Transfusion(s) day 1–3 post-TVRB | 10 (43.5) | 18 (31.6) | 0.4 |
| Composite complication endpointa | 11 (47.8) | 25 (43.9) | 0.8 |
| In-ICU deaths | 3 (13.0) | 3 (5.3) | 0.3 |
| Dialysis at ICU discharge | 6/20 (30.0) | 13/53 (24.5) | 0.7 |
| End-stage renal disease | 5/20 (25.0) | 10/53 (18.9) | 0.5 |
| TVRB = transvenous renal biopsy; ICU = intensive care unit; SAPS II = Simplified Acute Physiology Score II; SOFA = Sequential Organ-Failure Assessment; RBCs = red blood cells; AKI, Acute Kidney, Injury..  aExpressed as gram of urine protein/gram of urine creatinine.  b*n=72.*  Continuous variables are expressed as mean ±standard deviation or median [25th;75th-percentile interquartile range (IQR)] and compared using Student’s *t*-test or Wilcoxon’s rank test; categorical variables are expressed as *n* (%) and compared with χ2 tests. | | | |

**Supplemental TABLE 6. Comparison between transplant and non-transplant patient**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **Transplant patient**  ***n* = 21** | **Non-transplant patient**  ***n* = 59** | ***p*** |
| Age | 46.3 ± 12.9 | 47.7 ± 19.9 | 0.8 |
| Women | 10 (47.6) | 31 (52.5) | 0.8 |
| Medical patient | 6 (28.6) | 43 (72.9) | 0.001 |
| Chronic kidney disease | 11 (52.4) | 13 (22.0) | 0.01 |
| Admission-to-TVRB interval, days |  |  |  |
| **In-ICU days** | **32.0 [12.5-62.0]** | **4.0 [2-10]** | **0.0001** |
| Admission-to-TVRB interval/in-ICU days | 0.58 [0.43-0.77] | 0.37 [0.18-0.6] | 0.02 |
| Pre-TVRB SAPS II score | 42 [26.5-68] | 42 [30-63] | 0.8 |
| Pre-TVRB SOFA score | 10 [4.5-14] | 7 [5-12] | 0.3 |
| Renal SOFA score ≥ 3 | 11 (52.4) | 39 (66.1) | 0.3 |
| Respiratory SOFA score ≥ 3 | 11 (52.4) | 19 (32.2) | 0.1 |
| Cardiovascular SOFA score ≥ 3 | 15 (61.9) | 16 (27.1) | 0.08 |
| Neurologic SOFA score ≥ 3 | 9 (42.9) | 17 (28.8) | 0.3 |
| Hematologic SOFA score ≥ 3 | 5 (23.8) | 7 (11.9) | 0.3 |
| Liver SOFA score ≥ 3 | 2 (9.5) | 3 (5.1) | 0.6 |
| AKI status |  |  |  |
| No AKI | 0 (0.0) | 4 (6.8) | 0.6 |
| Stage 1 | 0 (0.0) | 2 (3.4) | 1 |
| Stage 2 | 2 (9.5) | 2 (3.4) | 0.3 |
| Stage 3 | 19 (90.5) | 51 (86.4) | 1 |
| Serum creatinine, µmol/L | 344 [273.5-404.0] | 430 [268-504] | 0.07 |
| Proteinuria, g/ga | 1.87 [1-3.8] | 2.95 [1.43-4.95] | 0.06 |
| Hematuria, ×103 RBCs/mL | 200 [10-1800] | 80 [24-470] | 0.4 |
| >104 RBCs/mLb | 14 (73.7) | 44 (83.0) | 0.5 |
| In-ICU organ-failure treatments |  |  |  |
| Renal replacement therapy | 18 (85.7) | 47 (79.7) | 0.4 |
| **Mechanical ventilation** | **19 (90.5)** | **30 (50.8)** | **0.001** |
| **Vasopressor use** | **19 (90.5)** | **25 (42.4)** | **0.0001** |
| **Extracorporeal membrane oxygenation** | **14 (66.7)** | **12 (20.3)** | **0.0001** |
| Diagnostic yield |  |  |  |
| Diagnosis | 19 (90.5) | 58 (98.3) | 0.1 |
| **Acute tubular necrosis** | **7 (33.3)** | **16 (27.1)** | **0.6** |
| Potentially treatable causeb | 10 (47.6) | 37 (62.7) | 0.2 |
| No diagnosis | 2 (9.5) | 1 (1.7) | 0.1 |
| Organ-support treatments on TVRB day |  |  |  |
| Renal replacement therapy | 15 (71.4) | 45 (76.3) | 0.8 |
| Mechanical ventilation | 3 (14.3) | 20 (33.9) | 0.1 |
| Vasopressor use | 3 (14.3) | 8 (13.6) | 1 |
| Extracorporeal membrane oxygenation | 1 (4.8) | 5 (8.5) | 1 |
| TVRB-day SOFA score | 5 [4.5-7.5] | 6 [4-8] | 0.8 |
| Bleeding-risk factors on TVRB day |  |  |  |
| 1 risk factor | 8 (38.1) | 29 (49.2) | 0.4 |
| **2 Risk factors** | **13 (61.9)** | **18 (30.5)** | **0.01** |
| 3 risk factors | 0 (0.0) | 5 (8.5) | 0.3 |
| Complication of TVRB |  |  |  |
| Renal hematoma | 3 (14.3) | 2 (3.4) | 0.1 |
| Macroscopic hematuria | 0 (0.0) | 2 (3.4) | 1 |
| **Transfusion(s) day 1–3 post-TVRB** | **11 (52.4)** | **17 (28.8)** | **0.065** |
| **Composite complication endpointc** | **13 (61.9)** | **23 (39.0)** | **0.08** |
| In-ICU deaths | 2 (9.5) | 4 (6.8) | 0.6 |
| Dialysis at ICU discharge | 6/18 (33.3) | 13/55 (23.6) | 0.3 |
| End-stage renal disease | 5/18 (27.8) | 10/55 (18.2) | 0.3 |
| TVRB = transvenous renal biopsy; ICU = intensive care unit; SAPS II = Simplified Acute Physiology Score II; SOFA = Sequential Organ-Failure Assessment; RBCs = red blood cells; AKI, Acute Kidney, Injury.  aExpressed as gram of urine protein/gram of urine creatinine.  b*n*=72.  cComposite complication endpoint: renal hematoma, macroscopic hematuria, transfusion during days 1–3 post-TVRB, TVRB-day–to–day +3 post-TVRB Sequential Organ-Failure Assessment (SOFA) score increase ≥ 1 point or TVRB-day–to–day +3 hemoglobin decrease ≤ –2 g/dL.  Continuous variables are expressed as mean ±standard deviation or median [25th;75th-percentile interquartile range (IQR)] and compared using Student’s *t*-test or Wilcoxon’s rank test; categorical variables are expressed as *n* (%) and compared with χ2 tests. | | | |