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| **Supplemental Table 1. Demographic, Comorbidities, Clinical, and Laboratory Characteristics of ICU Patients who Received Support with High-Flow Nasal Cannula** |
|  |  | **Heated HFNC outcome**  |
|   | **Total** **(n=109)** | **Did not receive MV** **(n=31)** | **Received MV** **(n=78)** | **P-valuea** |
|   | **n (%)** |   |
| **Demographics and anthropometrics** |   |   |   |   |
| Age (years), median [IQR] | 62 [55-73] | 62 [47-67] | 65 [56-75] | 0.1 |
| Female | 46 (42.2) | 13 (41.9) | 33 (42.3) | 0.9 |
| Race |   |   |   | 0.8 |
| Black | 68 (62.4) | 20 (64.5) | 48 (61.5) |   |
| White | 22 (20.2) | 5 (16.1) | 17 (21.8) |   |
| Other | 19 (17.4) | 6 (19.4) | 13 (16.7) |   |
| BMI (kg/m2), median [IQR] | 31.3 [27.5-37.1] | 29.8 [26.6-37.0] | 31.7 [28.0-37.1] | 0.4 |
| **Comorbidities** |   |   |   |   |
| Diabetes | 48 (44.0) | 12 (38.7) | 36 (46.2) | 0.5 |
| Hypertension | 44 (40.4) | 15 (48.4) | 29 (37.2) | 0.3 |
| CKD | 22 (20.2) | 5 (16.1) | 17 (21.8) | 0.5 |
| ESRD | 9 (8.3) | 3 (9.7) | 6 (7.7) | 0.7 |
| COPD | 21 (19.3) | 2 (6.5) | 19 (24.4) | 0.04 |
| Elixhauser index, median [IQR] | 5.0 [3.0-7.0] | 4.0 [3.0-7.0] | 5.0 [3.0-7.0] | 0.2 |
| **Clinical and laboratoryb characteristics** |   |   |   |   |
| Time from hospital to ICU admission (days), median [IQR] | 1.0 [0.0-2.0] | 1.0 [0.0-2.0] | 1.0 [0.0-3.0] | 0.9 |
| SOFA score, median [IQR] | 7.0 [5.0-10.0] | 3.0 [2.0-5.0] | 9.0 [7.0-11.0] | <0.0001 |
| WBC(x103/mm3) , median [IQR]  | 8.3 [5.7-10.9] | 5.8 [4.7-9.6] | 8.7 [6.2-12.1] | 0.01 |
| Absolute lymphocytes (x103/mm3), median [IQR] (n=100) | 1.0 [0.8-1.3] | 0.9 [0.6-1.3] | 1.0 [0.8-1.3] | 0.6 |
| CRP (mg/L), median [IQR], (n=102) | 160 [111-216] | 148 [114-223] | 164 [111-213] | 1.0 |
| D-dimer (ng/mL), median [IQR], (n=102) | 1,088 [662-2,290] | 1,063 [711-2,290] | 1,099 [650-2,328] | 1.0 |
| ICU = intensive care unit, IQR = interquartile range, BMI = body mass index, ESRD = end-stage renal disease, COPD = chronic obstructive lung disease, SOFA = sequential organ failure assessment, WBC = white blood cell count, CRP = C-reactive protein, L = liters, HFNC = high-flow nasal cannula, CRRT = continuous renal replacement therapy, HD = hemodialysis |
| a. P-values represent Chi-Square or Fisher's Exact test for differences in proportions for categorical variables and Kruskal-Wallis test for differences in medians for continuous variables |
| b. Labs represent worse value within 24-72 hours of ICU admission  |

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| **Supplemental Table 2. Associations Between Predictor Variables and Death** |
|   | **aOR**  | **95% CI** |
| **Time from ICU admission to intubation** |  |  |
| <8 hours | ref. | ref. |
| 8-24 hours | 0.73 | 0.29-1.85 |
| ≥24 hours  | 2.34 | 0.73-7.44 |
| **Demographics and anthropometrics** |   |   |
| Age (years)a | 1.98 | 1.36-2.87 |
| Female | 0.73 | 0.33-1.61 |
| Race |   |   |
| Black | ref. | ref. |
| White | 0.19 | 0.04-4.63 |
| Other | 1.37 | 0.41-4.63 |
| BMI (kg/m2)b | 0.93 | 0.87-0.99 |
| **Comorbidities** |   |   |
| Elixhauser indexb | 0.99 | 0.85-1.16 |
| **Clinical and laboratory characteristics** |   |   |
| Time from hospital to ICU admission (days)b | 1.24 | 1.02-1.51 |
| SOFA scoreb | 1.27 | 1.07-1.50 |
| HFNC prior to intubation | 0.65 | 0.27-1.55 |
| aOR = adjusted odds ratio, CI = confidence interval, ICU = intensive care unit, IQR = interquartile range, BMI = body mass index, SOFA = sequential organ failure assessment, HFNC = high-flow nasal cannula,  |
| a. aOR is for every 10 year increase in age |
| b. aOR is for every increase in 1 unit  |

