Table 1. Descriptive characteristics of cardiovascular adverse events reported for COVID-19 treatment and use of monoclonal antibody products.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | All COVID-19 treatments | Casirivimab + Imdevimab | Bamlanivimab | Bamlanivimab +etesevimab | Sotrovimab | Tocilizumab | Bebtelovimab | Tixagevimab + cilgavimab |
| Total AE, n | 47327 | 3686 | 3797 | 1755 | 1765 | 3006 | 467 | 100 |
| Cardiovascular AE, n (%) | 4689 (9.9%) | 407 (11.0%) | 442 (11.6%) | 165 (9.4%) | 100 (5.7%) | 230 (7.7%) | 51 (10.9%) | 13 (13.0%) |
| Cardiac arrhythmias, n (%) | 2215 (4.7%) | 101 (2.7%) | 131 (3.5%) | 31 (1.8%) | 26 (1.5%) | 55 (1.8%) | 12 (2.6%) | 1 (1.0%) |
| Cardiac failure, n (%) | 351 (0.7%) | 20 (0.5%) | 33 (0.9%) | 12 (0.7%) | 12 (0.7%) | 38 (1.3%) | 0 (0.0%) | 0 (0.0%) |
| Cardiomyopathy, n (%) | 75 (0.2%) | 2 (0.1%) | 9 (0.2%) | 0 (0.0%) | 0 (0.0%) | 4 (0.1%) | 0 (0.0%) | 0 (0.0%) |
| Embolic and thrombotic events, n (%) | 1462 (3.1%) | 83 (2.3%) | 135 (3.6%) | 44 (2.5%) | 23 (1.3%) | 151 (5.0%) | 5 (1.1%) | 7 (7.0%) |
| Hypertension | 906 (1.9%) | 210 (5.7%) | 157 (4.1%) | 79 (4.5%) | 40 (2.3%) | 37 (1.2%) | 35 (7.5%) | 3 (3.0%) |
| Ischemic heart disease, n (%) | 322 (0.7%) | 46 (1.2%) | 72 (1.9%) | 13 (0.7%) | 9 (0.5%) | 16 (0.5%) | 3 (0.6%) | 3 (3.0%) |
| Pulmonary hypertension | 42 (0.1%) | 3 (0.1%) | 4 (0.1%) | 0 (0.0%) | 0 (0.0%) | 2 (0.1%) | 0 (0.0%) | 0 (0.0%) |
| Torsade de Pointes/QT prolongation, n (%) | 1168 (2.5%) | 9 (0.2%) | 11 (0.3%) | 2 (0.1%) | 0 (0.0%) | 7 (0.2%) | 1 (0.2%) | 0 (0.0%) |
| Age reported, n | 39602 | 3549 | 3196 | 1557 | 1366 | 1611 | 390 | 92 |
| Age, mean (SEM) | 58 (18) | 54 (19) | 66 (15) | 52 (19) | 50 (21) | 59 (16) | 52 (19) | 58 (21) |
| Weight reported, n | 17527 | 2418 | 2320 | 1043 | 560 | 764 | 277 | 71 |
| Weight, mean (SEM) | 87 (28) | 91 (27) | 93 (26) | 90 (28) | 78 (26) | 90 (26) | 84 (24) | 73 (23) |
| Gender reported, n | 42230 | 3583 | 3679 | 1678 | 1441 | 1788 | 448 | 96 |
| Male, n (%) | 21961 (52.0%) | 1550 (43.3%) | 1927 (52.4%) | 664 (39.6%) | 439 (30.5%) | 1238 (69.2%) | 146 (32.6%) | 47 (49.0%) |
| Reporting sources, n | 45176 | 3127 | 3728 | 1508 | 1623 | 2967 | 362 | 86 |
| Consumer, n (%) | 10646 (23.6%) | 353 (11.3%) | 983 (26.4%) | 254 (16.8%) | 173 (10.7%) | 183 (6.2%) | 119 (32.9%) | 12 (14.0%) |
| Health professional, n (%) | 12593 (27.9%) | 560 (17.9%) | 607 (16.3%) | 234 (15.5%) | 120 (7.4%) | 1095 (36.9%) | 58 (16.0%) | 7 (8.1%) |
| Physician, n (%) | 9551 (21.1%) | 256 (8.2%) | 332 (8.9%) | 161 (10.7%) | 944 (58.2%) | 1064 (35.9%) | 22 (6.1%) | 28 (32.6%) |
| Pharmacist, n (%) | 12386 (27.4%) | 1958 (62.6%) | 1806 (48.4%) | 859 (57.0%) | 386 (23.8%) | 625 (21.1%) | 163 (45.0%) | 39 (45.3%) |

Table 2. Outcomes associated with use of monoclonal antibody products for COVID-19.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Casirivimab + Imdevimab | Bamlanivimab | Bamlanivimab +etesevimab | Sotrovimab | Tocilizumab | Bebtelovimab | Tixagevimab + cilgavimab |
| CVAE, n | 370 | 383 | 141 | 86 | 229 | 46 | 13 |
| Non-CVAE, n | 2520 | 2111 | 1053 | 543 | 2199 | 266 | 69 |
| DE in CVAE, n (%) | 28 (7.6%) | 44 (11.5%) | 12 (8.5%) | 13 (15.1%) | 114 (49.8%) | 0 (0.0%) | 2 (15.4%) |
| DE in non-CVAE, n (%) | 102 (4.0%) | 177 (8.4%) | 61 (5.8%) | 81 (14.9%) | 813 (37.0%) | 6 (2.3%) | 4 (5.8%) |
| P value | 0.002 | 0.049 | 0.206 | 0.962 | 1.5E-4 | 0.597a | 0.240a |
| LT in CVAE, n (%) | 28 (7.6%) | 25 (6.5%) | 12 (8.5%) | 12 (14.0%) | 26 (11.4%) | 5 (10.9%) | 1 (7.7%) |
| LT in non-CVAE, n (%) | 116 (4.6%) | 70 (3.3%) | 92 (8.7%) | 28 (5.2%) | 99 (4.5%) | 16 (6.0%) | 11 (15.9%) |
| P value | 0.014 | 0.003 | 0.929 | 0.002 | 8.0E-6 | 0.212a | 0.680a |
| HO in in CVAE, n (%) | 190 (51.4%) | 237 (61.9%) | 70 (49.6%) | 28 (32.6%) | 27 (11.8%) | 15 (32.6%) | 4 (30.8%) |
| HO in non-CVAE, n (%) | 1053 (41.8%) | 1330 (63.0%) | 371 (35.2%) | 205 (37.8%) | 519 (23.6%) | 49 (18.4%) | 27 (39.1%) |
| P value | 5.2E-4 | 0.676 | 8.7E-4 | 0.354 | 4.6E-5 | 0.028 | 0.757a |
| DS in CVAE, n (%) | 0 (0.0%) | 0 (0.0%) | 1 (0.7%) | 1 (1.2%) | 1 (0.4%) | 0 (0.0%) |  |
| DS in non-CVAE, n (%) | 20 (0.8%) | 5 (0.2%) | 2 (0.2%) | 5 (0.9%) | 4 (0.2%) | 2 (0.8%) |  |
| P value | 0.098a | 1.0a | 0.314a | 0.588a | 0.391a | 1.0a |  |
| CA in CVAE, n (%) | 0 (0.0%) |  | 0 (0.0%) |  |  |  |  |
| CA in non-CVAE, n (%) | 1 (0.0%) |  | 1 (0.1%) |  |  |  |  |
| P value | 1.0a |  | 1.0a |  |  |  |  |
| RI in CVAE, n (%) | 23 (6.2%) | 1 (0.3%) | 15 (10.6%) | 2 (2.3%) | 1 (0.4%) | 5 (10.9%) | 0 (0.0%) |
| RI in non-CVAE, n (%) | 252 (10.0%) | 8 (0.4%) | 152 (14.4%) | 44 (8.1%) | 3 (0.1%) | 57 (21.4%) | 4 (5.8%) |
| P value | 0.021 | 1.0a | 0.222 | 0.071a | 0.327a | 0.112a | 1.0a |
| OT in CVAE, n (%) | 101 (27.3%) | 76 (19.8%) | 31 (22.0%) | 30 (34.9%) | 60 (26.2%) | 21 (45.7%) | 6 (46.2%) |
| OT in non-CVAE, n (%) | 976 (38.7%) | 521 (24.7%) | 374 (35.5%) | 180 (33.1%) | 761 (34.6%) | 136 (51.1%) | 23 (33.3%) |
| P value | 2.2E-5 | 0.041 | 0.001 | 0.751 | 0.011 | 0.493 | 0.528a |

CVAE: cardiovascular adverse events; a, Fisher’s exact test

- DE Death

- LT Life-Threatening

- HO Hospitalization - Initial or Prolonged

- DS Disability

- CA Congenital Anomaly

- RI Required Intervention to Prevent Permanent Impairment/Damage

- OT Other Serious (Important Medical Event)