**Supplementary Table 1.** Univariate and multivariate analyses for predictive factors of strong antibody response at each time point

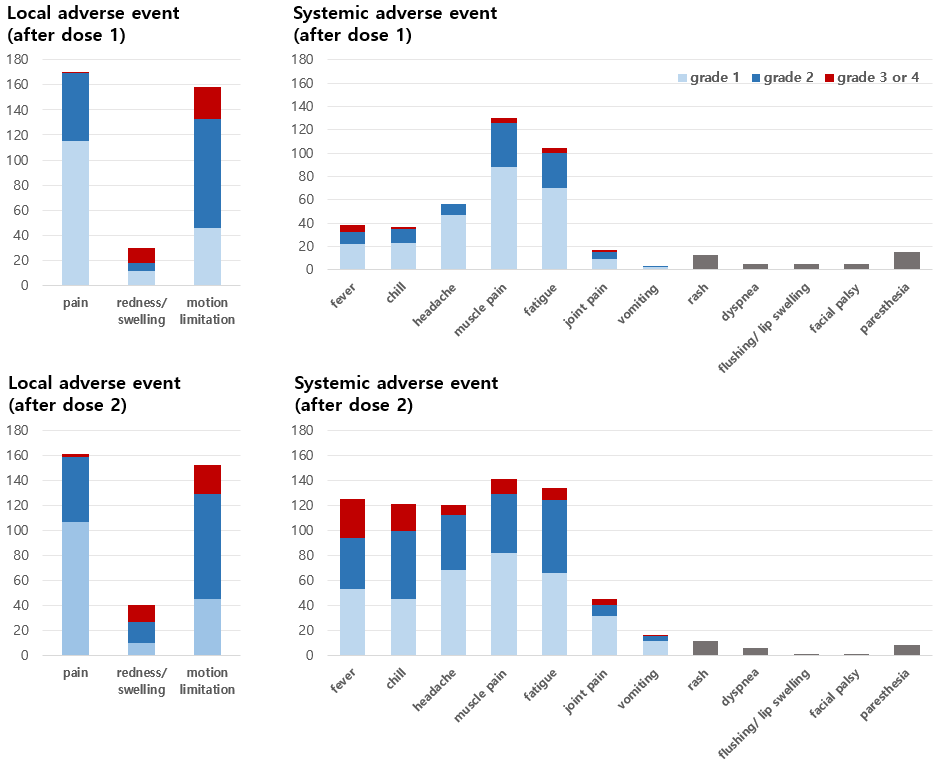
|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Anti-S IgG at T1 | | *p*-value | Adjusted OR (95% CI) | Anti-S IgG at T2 | | *p*-value | Adjusted OR (95% CI) |
| <250 U/mL  (n=134) | ≥250 U/mL  (n=43) | <5400 U/mL  (n=111) | ≥5400 U/mL  (n=60) |
| Age, year (SD) | 25.2 (3.6) | 25.9 (4.5) | 0.322 | 1.036 (0.953-1.127)a | 25.3 (2.7) | 25.5 (5.4) | 0.759 | 1.009 (0.931-1.094)a |
| 1.023 (0.944-1.110)b |
| Male | 39 (29.1%) | 14 (32.6%) | 0.667 | 1.223 (0.522-2.867)a | 72 (64.9%) | 46 (76.7%) | 0.111 | 1.525 (0.674-3.449)a |
| 1.716 (0.718-4.102)b |
| BMI, kg/m2 (SD) | 21.3 (2.8) | 22.1 (3.0) | 0.103 | 1.108 (0.970-1.266)a | 21.8 (2.9) | 21.2 (2.9) | 0.212 | 0.969 (0.854-1.100)a |
| 0.982 (0.863-1.116)b |
| AE after dose 1 |  |  |  |  |  |  |  |  |
| Any AE | 134 (100%) | 42 (97.7%) | 0.243 |  | 110 (99.1%) | 60 (100%) | 0.461 |  |
| Any local AE | 132 (98.5%) | 42 (97.7%) | 0.568 |  | 108 (97.3%) | 60 (100%) | 0.271 |  |
| pain | 130 (97%) | 40 (93%) | 0.226 | 0.471 (0.097-2.288)a | 105 (94.6%) | 59 (98.3%) | 0.227 | 2.638 (0.297-23.399)a |
| swelling | 23 (17.2%) | 4 (9.3%) | 0.212 |  | 18 (16.2%) | 9 (15.0%) | 0.835 |  |
| Motion limitation | 119 (88.8%) | 39 (90.7%) | 0.490 |  | 95 (85.6%) | 57 (95.0%) | 0.062 |  |
| Any systemic AE | 118 (88.1%) | 37 (86.0%) | 0.728 |  | 96 (86.5%) | 53 (88.3%) | 0.731 |  |
| fever | 28 (20.9%) | 10 (23.3%) | 0.743 |  | 19 (17.1%) | 16 (26.7%) | 0.140 |  |
| chill | 30 (22.4%) | 7 (16.3%) | 0.391 |  | 23 (20.7%) | 11 (18.3%) | 0.709 |  |
| headache | 40 (29.9%) | 16 (37.2%) | 0.367 |  | 32 (28.8%) | 22 (36.7%) | 0.293 |  |
| Muscle pain | 98 (73.1%) | 32 (74.4%) | 0.868 |  | 77 (69.4%) | 48 (80.0%) | 0.135 |  |
| Fatigue | 78 (58.2%) | 26 (60.5%) | 0.794 |  | 66 (59.5%) | 33 (55.0%) | 0.573 |  |
| arthralgia | 13 (9.7%) | 4 (9.3%) | 0.602 |  | 10 (9.0%) | 6 (10.0%) | 0.832 |  |
| vomiting | 3 (2.2%) | 0 (0.0%) | 0.432 |  | 3 (2.7%) | 0 (0.0%) | 0.271 |  |
| Rash | 10 (7.5%) | 3 (7.0%) | 0.609 |  | 10 (9.0%) | 3 (5.0%) | 0.267 |  |
| dyspnea | 4 (3.0%) | 1 (2.3%) | 0.648 |  | 4 (3.6%) | 1 (1.7%) | 0.424 |  |
| flushing | 4 (3.0%) | 1 (2.3%) | 0.648 |  | 4 (3.6%) | 1(1.7%) | 0.424 |  |
| Facial palsy | 4 (3.0%) | 1 (2.3%) | 0.648 |  | 4 (3.6%) | 1(1.7%) | 0.424 |  |
| paresthesia | 14 (10.4%) | 1 (2.3%) | 0.080 |  | 12 (10.8%) | 3 (5.0%) | 0.200 |  |
| Antipyretic use | 81 (60.4%) | 26 (60.5%) | 0.998 | 1.009 (0.491-2.073)a | 58 (52.3%) | 43 (71.7%) | 0.014 | 2.202 (1.110-4.367)a |
| AE after dose 2 |  |  |  |  |  |  |  |  |
| Any AE |  |  |  |  | 108 (97.3%) | 60 (100%) | 0.271 |  |
| Any local AE |  |  |  |  | 107 (96.4%) | 57 (95.0%) | 0.470 |  |
| pain |  |  |  |  | 104 (93.7%) | 57 (95.0%) | 0.510 | 0.511 (0.098-2.652)b |
| swelling |  |  |  |  | 21 (18.9%) | 17 (28.3%) | 0.158 |  |
| Motion limitation |  |  |  |  | 98 (88.3%) | 54 (90.0%) | 0.734 |  |
| Any systemic AE |  |  |  |  | 104 (93.7%) | 59 (98.3%) | 0.161 |  |
| fever |  |  |  |  | 76 (68.5%) | 49 (81.7%) | 0.063 |  |
| chill |  |  |  |  | 73 (65.8%) | 48 (80.0%) | 0.051 |  |
| headache |  |  |  |  | 76 (68.5%) | 44 (73.3%) | 0.507 |  |
| Muscle pain |  |  |  |  | 89 (80.2%) | 52 (86.7%) | 0.287 |  |
| Fatigue |  |  |  |  | 86 (77.5%) | 48 (80.0%) | 0.702 |  |
| arthralgia |  |  |  |  | 29 (26.1%) | 16 (26.7%) | 0.939 |  |
| vomiting |  |  |  |  | 12 (10.8%) | 4 (6.7%) | 0.375 |  |
| Rash |  |  |  |  | 6 (5.4%) | 5 (8.3%) | 0.330 |  |
| dyspnea |  |  |  |  | 6 (5.4%) | 0 (0.0%) | 0.071 |  |
| flushing |  |  |  |  | 1 (0.9%) | 0 (0.0%) | 0.649 |  |
| Facial palsy |  |  |  |  | 1 (0.9%) | 0 (0.0%) | 0.649 |  |
| paresthesia |  |  |  |  | 5 (4.5%) | 3 (5.0%) | 0.578 |  |
| Antipyretic use |  |  |  |  | 96 (86.5%) | 59 (98.3%) | 0.011 | 10.033 (1.185-84.924)b |

OR, odds ratio; SD, standard deviation; BMI, body mass index; AE, adverse event

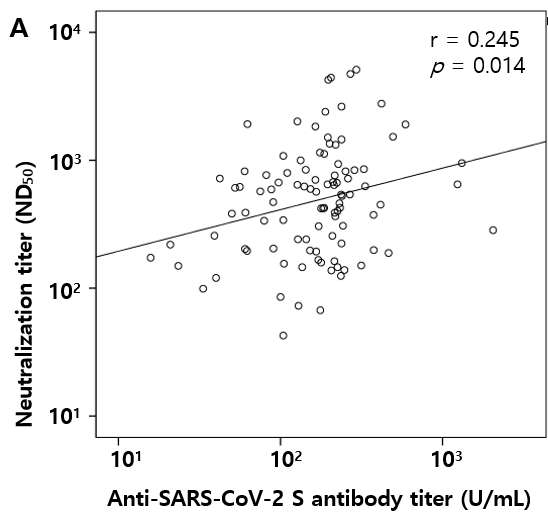
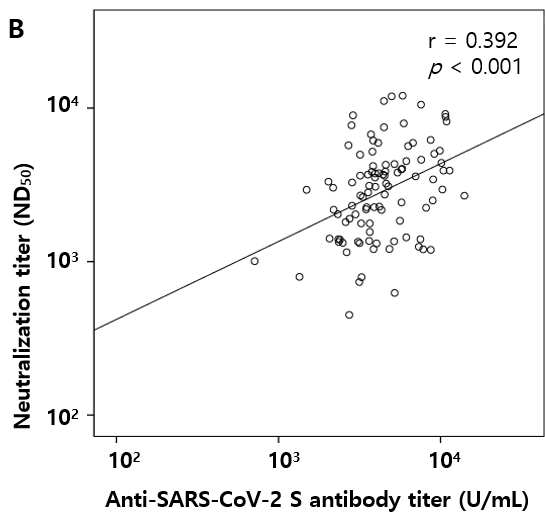
a Adjusted for age, sex, BMI, injection site pain after dose 1, and antipyretic use after dose 1

b Adjusted for age, sex, BMI, injection site pain after dose 2, and antipyretic use after dose 2

**Supplementary Figure 1.** Solicited adverse events after each dose.



**Supplementary Figure 2.** Correlation between anti-SARS-CoV-2 S IgG and neutralizing antibody titer at each time point: (A) Four weeks and (B) Eight weeks after first injection.

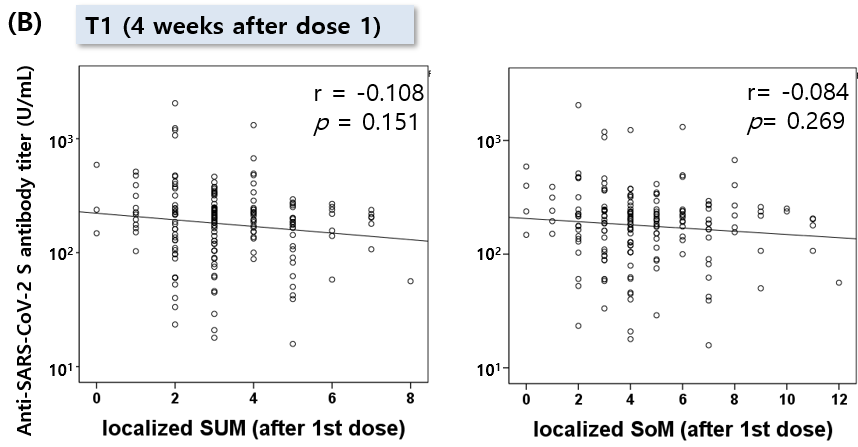
 

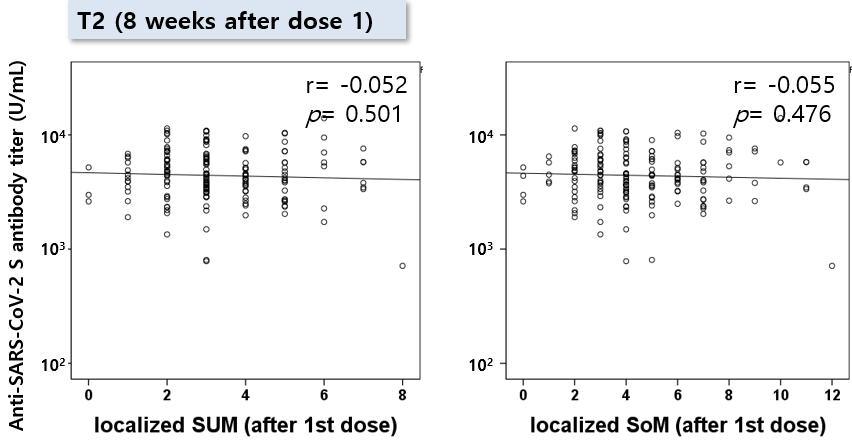
**Supplementary Figure 3.** Relationship of immune response with (A) highest severity of all adverse events, (B) highest severity of local adverse events, and (C) highest severity of systemic adverse events at each time point. Immune responses are presented as geometric mean titer.

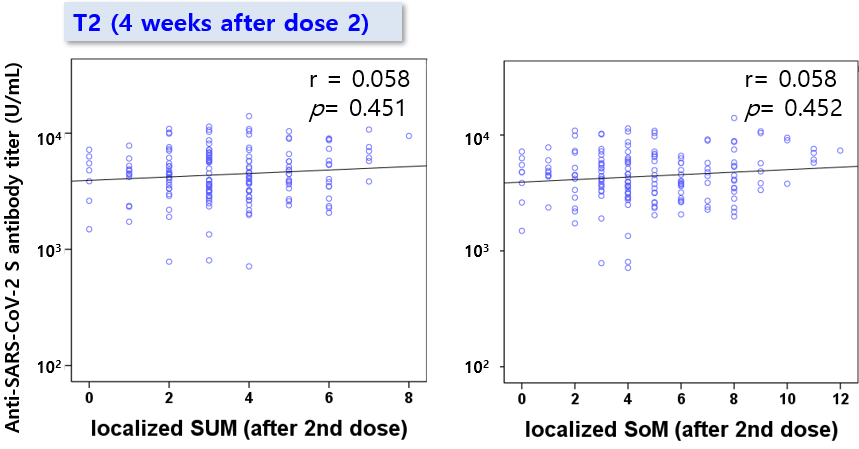
|  |
| --- |
|  |
|  |
|  |

**Supplementary Figure 4.** Relationship of anti-SARS-CoV-2 S antibody response with (A) systemic SUM and SOM, and (B) localized SUM and SOM at each time point. SUM, sum of the severity scores; SoM, sum of multiplying each symptoms' severity by the duration of symptoms

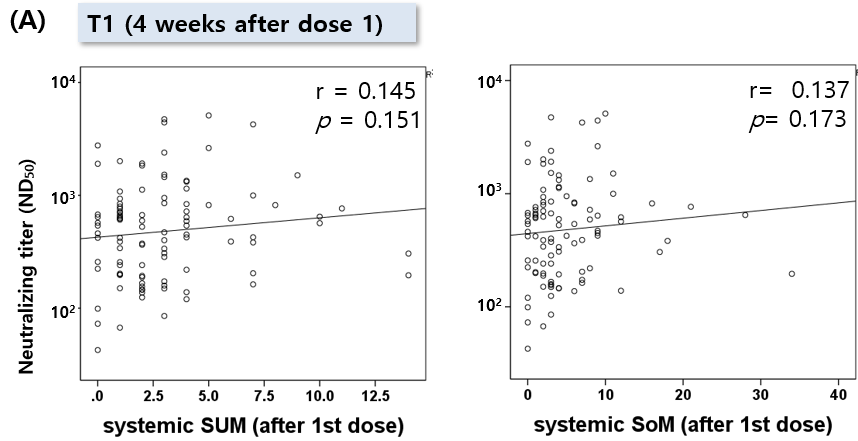
|  |
| --- |
|  |



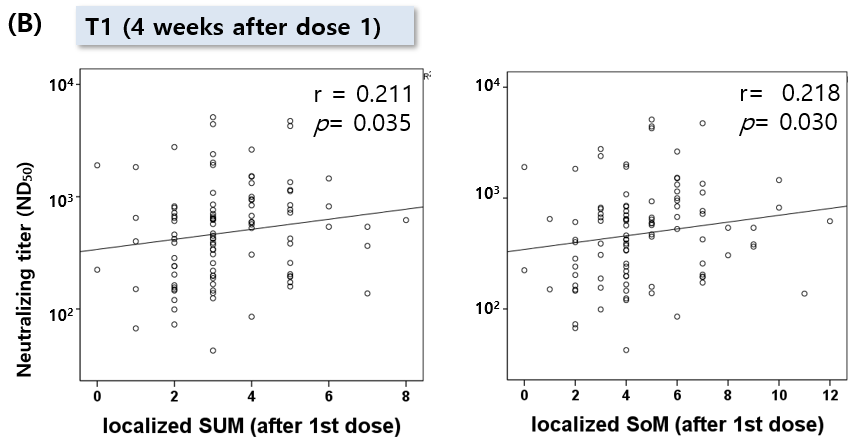


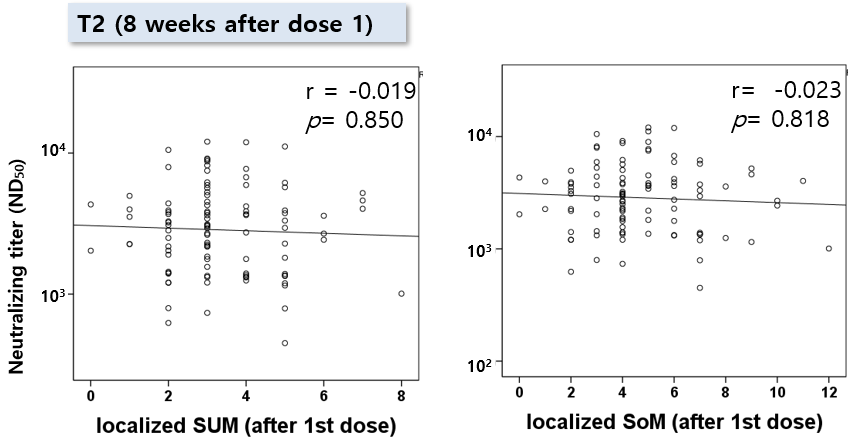


**Supplementary Figure 5.** Relationship of neutralizing antibody response (PRNT ND50) with (A) systemic SUM and SoM, and (B) localized SUM and SoM at each time point. PRNT, plaque reduction neutralization test; SUM, sum of the severity scores; SoM, sum of multiplying each symptoms' severity by the duration of symptoms



|  |
| --- |
|  |
|  |





|  |
| --- |
|  |

