**Virologica Sinica**

**Supplementary Data**

**Clinical and immunological features of convalescent pediatric patients infected with the SARS-CoV-2** **Omicron variant in Tianjin, China**

Jing-Yu Wang a, Tian-Ning Li a, Chun-Lei Zhou a, Jie Zhao a, Meng Wang a, Yuan Wang a, Yan Jiang a, He-Nan Dong b , Qian-Ru Qi c, Hong Mu a, \*

**a**Department of Clinical Lab, Tianjin First Central Hospital, Tianjin, 300192, China;

**b**The First Central Clinical College, Tianjin Medical University, Tianjin, 300192, China;

**c**Department of Clinical Lab, Tianjin Children's Hospital, Tianjin, 300074, China;

\* Corresponding author

E-mail address: tjmuhong@163.com (H. Mu)

ORCID: 0000-0002-8100-805X

**Table S1.** The difference in laboratory findings between healthy children control and convalescent pediatric patients

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Median (IQR)** |  |  |  |
| **Biomarker** | **Total**  **(N = 155)** | **Healthy children**  **(n = 45)** | **Pediatric patients**  **(n = 110)** | ***P* value a** |
| **Infection** |  |  |  |  |
| CRP (NR: 0–10 mg/L) |  |  |  |  |
| Level, mg/L | 0.48 (0.2–2.51） | 3.22 (2.13–4.94) | 0.26 (0.20–0.56) | 0.003 |
| Increased, No. (%) | 2 (1.3) | 0 (0.0) | 2 (1.8) | 1.00 |
| **Liver function** |  |  |  |  |
| ALT (NR: M, 0–50 U/L; W, 0–35 U/L) |  |  |  |  |
| Level, U/L | 13.41 (11.23–16.13) | 13 (11–16) | 13.48 (11.50–16.88) | 0.201 |
| Increased, No. (%) | 8 (5.2) | 1 (2.2) | 7 (6.4) | 0.438 |
| AST (NR: 17–59 U/L) |  |  |  |  |
| Level, U/L | 25.95 (21.05–29.50) | 20.00 (18–26) | 26.91 (23.82–30.89) | < 0.001 |
| Increased, No. (%) | 1 (0.6) | 0 (0.0) | 1 (0.9) | 1.00 |
| **Renal function** |  |  |  |  |
| Creatinine (NR: M, 58–110 μmol/L; W, 46–92 μmol/L) | |  |  |  |
| Level, μmol/L | 39.52 (33.86–46) | 44 (35–52) | 37.93 (36.63–43.51) | 0.006 |
| Reduced, No. (%) | 99 (64.2) | 1 (2.2) | 98 (89.1) | < 0.001 |
| BUN (NR: 2.5–7.1 mmol/L) |  |  |  |  |
| Level, mmol/L | 3.75 (3.11–4.56) | 3.67 (3.01–4.01) | 3.83 (3.15–4.64) | 0.083 |
| Increased, No. (%) | 1 (0.6) | 0 (0.0) | 1 (0.9) | 1.00 |

Note: data are presented as median (IQR) or No. (%). No. is the number of patients with available data. Percentages may not total 100 because of rounding.

Abbreviations: IQR, interquartile range; CRP, C-reactive protein; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BUN, blood urea nitrogen; NR, normal range; M, man; W, woman.

a *P* values when comparing pediatric patients and healthy children using *χ2* test, Fisher exact test, or Mann-Whitney U-test. *P* < 0.05 indicates statistically significant.

**Table S2.** The difference in immune features between healthy children and convalescent pediatric patients

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Median (IQR)** |  |  |  |
| **Biomarker** | **Total**  **(N = 155)** | **Healthy children**  **(n = 45)** | **Pediatric patients**  **(n = 110)** | ***P* value** |
| IgG, AU/mL | 145.19 (7.91–197.71) | 4.32 (1.28–18.78 ) | 185.45 (141.89–209.68) | < 0.001 |
| IgM, AU/mL | 0.3 (0.18–0.7) | 0.1 (0.06–0.35) | 0.43 (0.24–0.79) | 0.819 |
| WBCs, 109/L  (NR, A 3.5–9.5, C 4.4–11.9) | 6.68 (5.62–8.19) | 6.92 (5.58–8.26) | 6.64 (5.66–8.17) | 0.816 |
| Increased, No. (%) | 11 (7.1) | 2 (4.4) | 9 (8.2) | 0.512 |
| Neutrophils, 109/L  (NR, A 1.8–6.3, C 1.2–7.0) | 2.9 (2.24–3.87) | 2.78 (2.22–3.94) | 2.99 (2.28–3.86) | 0.752 |
| Increased, No. (%) | 6 (5.5) | 3 (6.7) | 3 (2.7) | 0.3587 |
| Lymphocytes, 109/L  (NR, A 1.1–6.3, C 1.8–6.3) | 2.94 (2.41–3.64) | 2.87 (2.31–3.74) | 2.95 (2.53–3.56) | 0.872 |
| Increased, No. (%) | 5 (4.6) | 2 (4.4) | 3 (2.7) | 0.6297 |
| Monocytes, 109/L  (NR, A 0.1–0.6, C 0.12–0.93) | 0.43 (0.34–0.51) | 0.43(0.38–0.51) | 0.43 (0.34–0.53) | 0.910 |
| Increased, No. (%) | 1 (0.6) | 0 (0.0) | 1 (0.9) | 1.00 |
| Eosinophils, 109/L  (NR, A 0.02–0.523, C 0–0.68) | 0.17 (0.13–0.29) | 0.16 (0.12–0.25) | 0.18 (0.13–0.32) | 0.141 |
| Increased, No. (%) | 4 (2.6) | 0 (0.0) | 4 (3.6) | 0.3221 |
| Basophils,109/L  (NR, A 0–0.06, C 0–0.07) | 0.03 (0.02–0.04) | 0.04 (0.03–0.05) | 0.03 (0.02–0.04) | < 0.001 |
| Increased, No. (%) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1.00 |
| CD3+ T cells  (NR, 56%–86%) | 70.83 (66.14–74.75) | 68.4（64.6–75.7） | 71.38 (67.51–74.53) | 0.240 |
| Increased, No. (%) | 2 (1.3) | 1 (2.2) | 1 (0.9) | 0.5080 |
| CD4+ T cells  (NR, 33%–58%) | 38.95 (34.21–46.22) | 52.9 (46.2–61.6) | 36.47 (32.56–40.01) | < 0.001 |
| Increased, No. (%) | 14 (9.2) | 14 (31.1) | 0 (0.0) | < 0.001 |
| Reduced, No. (%) | 30 (57.7) | 1 (2.2) | 29 (26.4) | < 0.001 |
| CD8+ T cells  (NR, 13%–39%) | 28.13 (23.33–34.45) | 38.2 (30.2–32.7) | 25.67 (21.93–30.06) | < 0.001 |
| Increased, No. (%) | 23 (14.8) | 21 (46.7) | 2 (1.8) | < 0.001 |
| CD4+/CD8+  (NR, 1.4–2.0） | 1.38 (1.29–1.59) | 1.41 (1.37–1.5) | 1.42 (1.15–1.75) | 0.809 |
| Increased, No. (%) | 30 (19.7) | 13 (28.9) | 17 (15.5) | 0.066 |
| Reduced, No. (%) | 76 (50.0) | 24 (53.3) | 53 (48.2) | 0.560 |

Note: data are presented as median (IQR) or No. (%). No. is the number of patients with available data. Percentages may not total 100 because of rounding.

Abbreviations: IQR, interquartile range; WBCs, white blood cells; NR, normal range; A, adult; C, child.

a *P* values when comparing pediatric patients and healthy children using *χ2* test, Fisher exact test, or Mann-Whitney U-test. *P* < 0.05 indicates statistically significant.

**Table S3.** Differences in laboratory findings between vaccinated and unvaccinated adult patients during the recovery phases.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Median (IQR)** |  |  |  |
| **Biomarker** | **Total**  **(N = 320)** | **Unvaccinated adult patients**  **(n = 24)** | **Vaccinated adult patients**  **(n = 296)** | ***P* value a** |
| **Infection** |  |  |  |  |
| CRP |  |  |  |  |
| Level, mg/L | 0.97 (0.41–1.95) | 2.13 (0.56–5.29) | 0.95 (0.41–1.77) | 0.014 |
| Increased, No. (%) | 13 (4.1) | 5 (20.8) | 8 (2.7) | 0.001 |
| **Liver function** |  |  |  |  |
| ALT |  |  |  |  |
| Level, U/L | 33.44 (20.62–66.51) | 27.06 (17.04–39.58) | 34.08 (21.55–68.38) | 0.043 |
| Increased, No. (%) | 142 (44.4) | 8 (33.3) | 134 (45.3) | 0.258 |
| AST |  |  |  |  |
| Level, U/L | 23.17 (23.27–38.77) | 26.47 (23.37–39.16) | 29.42 (23.17–38.77) | 0.626 |
| Increased, No. (%) | 41 (12.8) | 4 (16.7) | 37 (12.5) | 0.528 |
| **Renal function** |  |  |  |  |
| Creatinine |  |  |  |  |
| Level, μmol/L | 59.63 (49.47–70.40) | 53.72 (43.53–64.30) | 60.14 (49.86–71.43) | 0.057 |
| Reduced, No. (%) | 57 (17.8) | 9 (37.5) | 48 (16.3) | 0.022 |
| BUN |  |  |  |  |
| Level, mmol/L | 4.00 (3.34–4.89) | 4.55 (3.41–6.23) | 3.98 (3.33–4.84) | 0.065 |
| Increased, No. (%) | 7 (2.2) | 2 (8.3) | 5 (1.7) | 0.090 |

Note: data are presented as median (IQR) or No. (%). No. is the number of patients with available data. Percentages may not total 100 because of rounding.

Abbreviations: IQR, interquartile range; CRP, C-reactive protein; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BUN, blood urea nitrogen.

a *P* values when comparing vaccinated and unvaccinated adult cases using the χ2 test, Fisher exact test, or Mann-Whitney U-test. *P* < 0.05 indicates statistical significance.

**Table S4.** Differences in immune features between vaccinated and unvaccinated adult patients during the recovery phases

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Median (IQR)** |  |  |  |
| **Biomarker** | **Total**  **(N = 320)** | **Unvaccinated adult patients**  **(n = 24)** | **Vaccinated adult patients**  **(n = 296)** | ***P* value a** |
| IgG, AU/mL | 207.24 (179.34–236.74) | 170.74 (2.59–183.60) | 212.1 (184.88–238.35) | < 0.001 |
| IgM, AU/mL | 0.48 (0.26–0.87) | 0.22 (0.18–0.46) | 0.49 (0.28–0.97) | < 0.001 |
| WBCs, 109/L | 6.20 (5.24–7.38) | 6.50 (4.86–7.75) | 6.20 (5.29–7.34) | < 0.001 |
| Increased, No. (%) | 16 (5.0) | 1 (4.2) | 15 (5.1) | 1.00 |
| Neutrophils, 109/L | 3.57 (2.85–4.35) | 3.61 (2.71–4.71) | 3.57 (2.85–4.32) | 0.979 |
| Increased, No. (%) | 11 (3.4) | 2 (8.3) | 9 (3.0) | 0.196 |
| Lymphocytes, 109/L | 2.05 (1.61–2.43) | 1.69 (1.33–2.413) | 2.06 (1.65–2.43) | 0.057 |
| Increased, No. (%) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 1.00 |
| Monocytes, 109/L | 0.42 (0.35–0.51) | 0.49 (0.40–0.55) | 0.42 (0.35–0.51) | 0.109 |
| Increased, No. (%) | 33 (10.3) | 2 (8.3) | 31 (10.5) | 1.00 |
| Eosinophils, 109/L | 0.13 (0.09–0.19) | 0.14 (0.11–0.18) | 0.13 (0.09–0.19) | 0.599 |
| Increased, No. (%) | 4 (1.3) | 0 (0) | 4 (1.4) | 1.00 |
| Basophils, 109/L | 0.03 (0.02–0.04) | 0.03 (0.02–0.04) | 0.02 (0.02–0.04) | 0.834 |
| Increased, No. (%) | 9 (2.8) | 1 (4.2) | 8 (2.7) | 0.509 |
| CD3+ T cells | 73.07 (67.39–77.79) | 74.38 (69.47–80.67) | 72.80 (67.27–77.37) | 0.247 |
| Increased, No. (%) | 8 (2.5) | 1 (4.2) | 7 (2.4) | 0.468 |
| CD4+ T cells | 40.80 (34.78–47.11) | 40.50 (34.68–47.63) | 40.80 (34.78–47.01) | 0.893 |
| Increased, No. (%) | 4 (1.3) | 0 (0.0) | 4 (3.6) | 1.00 |
| CD8+ T cells | 25.02 (19.57–30.57) | 29.38 (19.52–33.50) | 24.78 (19.78–29.80) | 0.243 |
| Increased, No. (%) | 29 (9.1) | 3 (12.5) | 26 (9.7) | 0.467 |
| CD4+/CD8+ | 1.67 (1.19–2.15) | 1.60 (1.05–2.07) | 1.68 (1.19–2.15) | 0.497 |
| Increased, No. (%) | 98 (30.6) | 7 (29.2) | 91 (30.7) | 0.872 |
| Reduced, No. (%) | 105 (32.8) | 11 (45.8) | 94 (31.8) | 0.158 |

Note: data are presented as median (IQR) or No. (%). No. is the number of patients with available data. Percentages may not total 100 because of rounding.

Abbreviations: IQR, interquartile range; WBCs, white blood cells;

a *P* values when comparing vaccinated and unvaccinated adult cases using the χ2 test, Fisher exact test, or Mann-Whitney U-test. *P* < 0.05 indicates statistical significance.

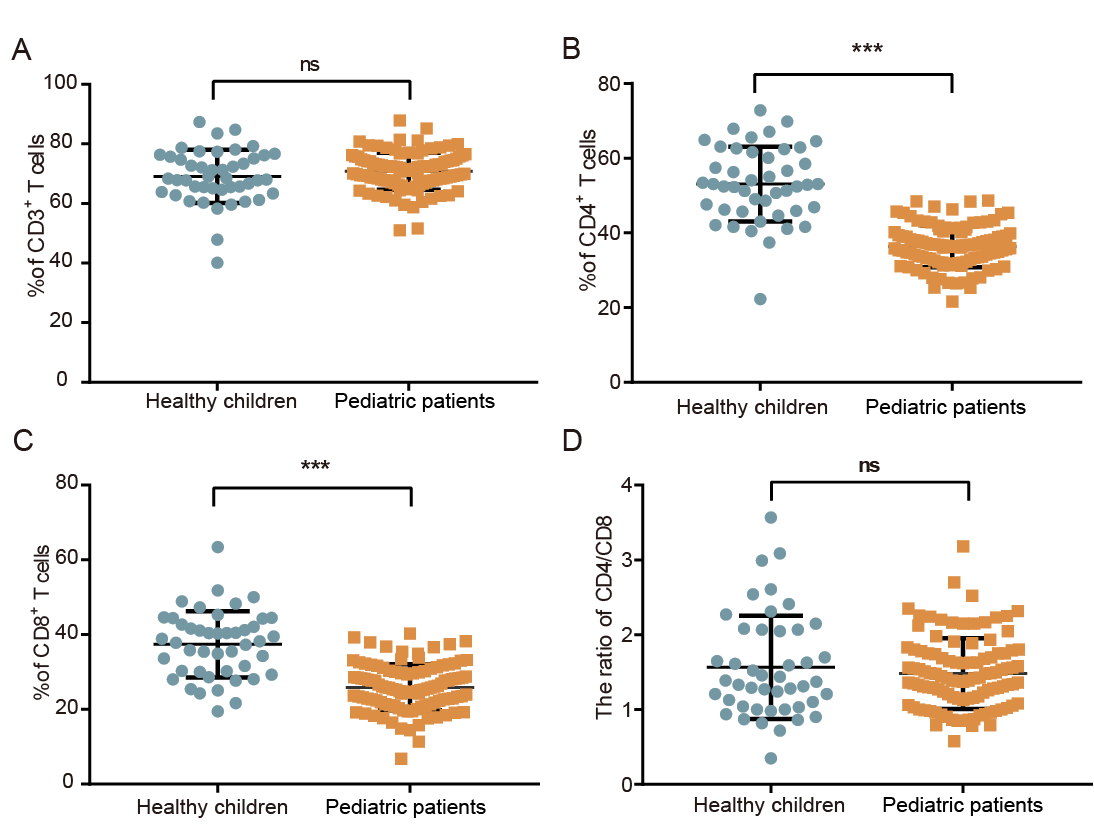


Figure.S1 T lymphocyte subsets were detected in healthy children and convalescent pediatrics infected with Omicron. **A**–**C** Comparisons of the percentage of CD3+ T (**A**), helper T cell subsets (**B**), and cytotoxic T cell subsets (**C**) between different groups. **D** The ratio of the CD4+/CD8+ T cell between different groups. Each dot represents one donor. Data were analyzed using Mann-Whitney U-test (ns, *P* > 0.05, \* *P* < 0.05, \*\* *P* < 0.01, and \*\*\* *P* < 0.001). Error bars represent the mean and SD.

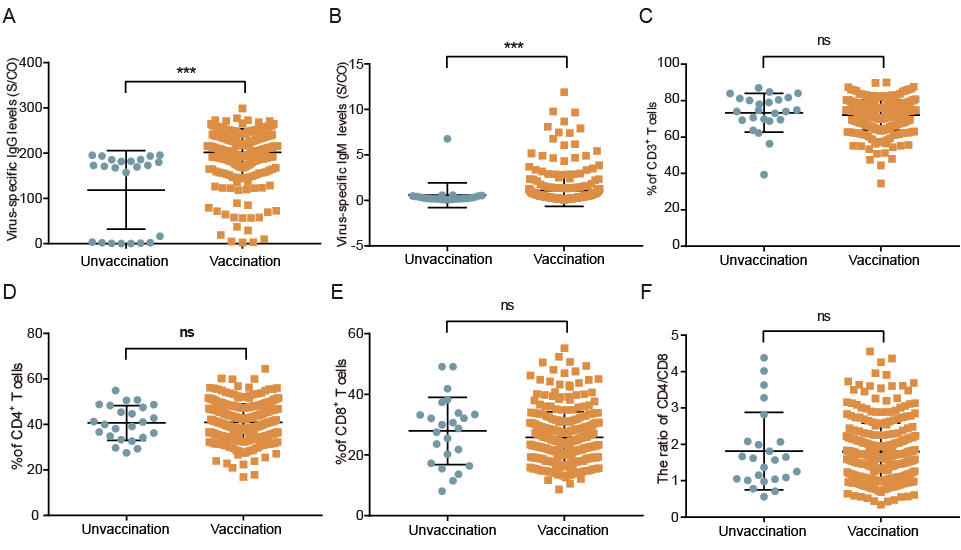


Figure. S2 Differences in immunological characteristics of adult patients with or without SARS-CoV-2 vaccination. **A, B** The levels of virus-specific IgG (**A**) and virus-specific IgM (**B**) between different groups. **C–E** Comparisons of the percentage of CD3+ T cell subsets (**C**), CD4+ T cell subsets (**D**) and CD8+ T cell subsets between different groups (**E**). **F** The ratio of the CD4+/CD8+ T cells between different groups. Each dot represents one donor. Data were analyzed using Mann-Whitney U-test (ns, *P* > 0.05, \* *P*< 0.05, \*\* *P* < 0.01, and \*\*\* *P* < 0.001). Error bars represent the mean and SD.