

Objective

The majority of children with coronavirus diseases 2019 (COVID-19) are asymptomatic or develop mild symptoms, a small number of patients requires hospitalization. Multisystem inflammatory syndrome in children (MIS-C) is one of the most severe clinical course of COVID-19.

Method

Quantitative antibody levels against SARS-CoV-2 spike protein in children with COVID-19 and MIS-C were measured three months after initial diagnosis between September 2021 and February 2022.

Results

Blood samples from 75 patients [n=36 (48%) with mild/asymptomatic, n=22 (29.3%) with moderate to severe SARS-CoV-2 infection and n=17 (22.6%) patients with MIS-C] were analyzed. The majority of the children with asymptomatic/mild COVID-19 symptoms(80.6%), moderate/ severe disease (90.9%), and MIS-C (82.4%) had detectable IgG antibodies to SARS-CoV-2 spike protein(p=0.567) (Table1). The mean antibody values against SARS-CoV-2 spike protein was 321.9±411.6 in group 1, 274±261 in group 2, and 220±299 in group 3, respectively (p>0.05). Patients diagnosed with COVID19 (asymptomatic/mild+moderate/severe) and those with MIS-C were also compared; the antibody positivity rate [COVID-19 group: 84.5%, MIS-Cgroup: 82.4%, (p=0.833)] (Table 2) and mean antibody value [COVID-19 group: 303.9±360.3, MIS-C group: 220 ±299, (p>0.05)] was similar in both groups.

Conclusion

Majority of children with COVID-19 and MIS-C had a detectable antibody level against SARS-CoV-2 spike protein three months after initial diagnosis. Quantitative antibody levels were similar in both asymptomatic/mild disease, moderate/severe disease, and MIS-C group. Long-term studies evaluating antibody responses in children with COVID-19 and MIS-C are needed for more accurate vaccine schedules.

Key Words: antibody response, spike protein, children, multi-system inflammatory syndrome, MIS-C, COVID-19

Table 2: Comparison of antibody positivity against SARS-CoV-2 spike protein in children with COVID-19 and MIS-C

SARS-COV-2 antibody values	COVID-19 n: 58	MIS-C, n: 17	p-value
<25.6 BAU/mL negative	5 (8.6)	2 (11.8)	0.695
≥25.6 to <35.2 BAU/mL borderline	4 (6.9)	1 (5.9)	0.883
≥35.2 BAU/mL positive	49 (84.5)	14 (82.4)	0.833

Table 1. Comparison of antibody positivity against SARS-CoV-2 spike protein in children with asymptomatic/mild, moderate/severe COVID-19 and MIS-C

SARS-COV-2 antibody values	Asymptomatic/ mild COVID-19, n: 36	Moderate/severe COVID-19, n:22	MIS-C, n: 17	p-value
<25.6 BAU/mL (negative)	3 (8.3)	2 (9.1)	2 (11.8)	0.922
≥25.6 to <35.2 BAU/mL (borderline)	4 (11.1)	0 (0)	1 (5.9)	0.255
≥35.2 BAU/mL (positive)	29 (80.6)	20 (90.9)	14 (82.4)	0.567