

SUPPLEMENTARY MATERIAL

Cytokine profile in COVID-19 infection: focus on interleukin-13, interleukin-33, and tumor necrosis factor- α as immunological markers

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Supplementary Table 1. Demographic variables of COVID-19 infected patients and healthy control group.

Variables		COVID-19 patients n=80		Healthy control n=40		95% CI	p
		n	%	n	%		
gender	Male	29	36.3	23	57.5	0.3432-0.5269	0.026*
	Female	51	63.7	17	42.5	0.4731-0.6568	
Age (years)	X±SEM	43.67±1.85 (14-82)		34.45±3.12 (11-76)		2.4484- 15.9936	0.0081**
Smoking	Positive	60	75.0	30	75.0	0.6627-0.8246	1.00
	Negative	20	25.0	10	25.0	0.1755-0.3373	
Chronic diseases	Have	21	26.25	10	25.0	0.1828-0.3462	3.535
	Not have	59	73.75	30	75.0	0.6538-0.8172	
Vaccinated two doses –Pfizer (BNT162b2)	Yes	65	81.25	30	75	0.7080-0.8604	0.428
	No	15	18.75	10	25	0.2499-0.4252	
Weight (kg)	X±SEM	64.58±1.01 (40-82)		60.05±2.43 (35-90)		0.1125-8.9475	0.0445**
Height (m)	X±SEM	1.64 ±0.007 (1.5-1.88)		1.63 ±0.11 (1.53-1.75)		-0.14463- 0.16463	0.8983
BMI (kg/m ²)	X±SEM	23.98 ±0.34 (16.02-30.08)		22.11±0.71 (13.5-9.39)		0.4950-3.2450	0.0081**

CI, confidence interval; BMI, body mass index; SEM, standard error mean; *significant (Chi square test); **significant (student's *t*-test).

Supplementary Table 2. Distribution of median level of interleukin (IL)-13, IL-33, and tumor necrosis factor- α in patients compared with control healthy group.

Cytokines	IL-13 patients n=80	IL-13 control n=40	IL-33 patients n=80	IL-33 control n=40	TNF- α patients n=80	TNF- α control n=40
Lower limit	0.210	0.270	2.680	8.050	0.47	1.71
Upper limit	11.980	5.780	223.740	101.47	90.57	81.62
Q1	0.943	0.712	15.770	13.400	4.38	4.90
Q3	3.098	3.273	35.42	56.60	9.45	11.93
IQR	2.155	2.560	19.66	43.20	5.07	7.03
Median	2.445	1.140	23.66	27.76	6.385	7.500
p*	0.158		0.674		0.264	

IL, interleukin; TNF, tumor necrosis factor; Q1, quartile 1; Q2, quartile 2; IQR, interquartile range; *Mann-Whitney test.

Supplementary Table 3. Pearson correlation between cytokines [interleukin (IL)-13, IL-33, and tumor necrosis factor- α] and other demographic variables.

Variable	IL-13	IL-33	TNF- α	Age (years)	Weight (kg)	Height (cm)	BMI (kg/m ²)
IL-13	1	0.844**	0.823**	0.175	0.248*	0.202	0.121
IL-33		1	0.932**	0.181	0.283*	0.151	0.199
TNF- α			1	0.223*	0.319**	0.147	0.236*
Age (years)				1	0.447**	0.286*	0.289**
Weight (Kg)					1	0.453**	0.799**
Height (M)						1	-0.170
BMI (kg/m ²)							1

IL, interleukin; TNF, tumor necrosis factor; BMI, body mass index; *correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed),

Supplementary Table 4. Pearson correlation between interleukin (IL)-13, IL-33, and tumor necrosis factor- α levels and laboratory variables.

Variable	IL-13	IL-33	TNF- α	Anti COVID-19 IgG antibodies	Anti COVID-19 IgM antibodies	CRP	ESR	Neutrophil level	Lymphocyte level	Platelets level	D-Dimer
IL-13	1	0.844**	0.823**	-0.031	-0.065	-0.038	-0.081	0.09	-0.108	0.118	-0.057
IL-33		1	0.932**	-0.018	-0.086	0.003	-0.037	0.082	-0.159	0.076	0.01
TNF- α			1	-0.017	-0.078	0.062	-0.061	0.059	-0.176	0.239*	-0.07
Anti COVID-19 IgG antibodies				1	0.802**	-0.146	0.024	-0.085	-0.086	-0.064	-0.053
Anti COVID-19 IgM antibodies					1	-0.061	0.088	-0.114	0.02	0.007	-0.035
CRP						1	0.000	-0.032	-0.059	0.038	0.2
ESR							1	-0.176	0.397**	-0.106	-0.012
Neutrophil level								1	0.262*	-0.162	-0.13
Lymphocyte level									1	0.09	-0.093
Platelets level										1	-0.006
D-Dimer											1

IL, interleukin; TNF, tumor necrosis factor; Ig, immunoglobulin; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; *correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed)

Supplementary Table 5. Spearman's correlation between interleukin (IL)-13, IL-33, and tumor necrosis factor- α levels and other variables.

Variable	IL-13	IL-33	TNF- α	Gender	Smoking	Vaccination
IL-13	1	0.613**	0.662**	-0.075	-0.115	-0.039
IL-33		1	0.73**	-0.148	-0.238	-0.095
TNF- α			1	0.023	-0.113	-0.063
Gender				1	0.766**	0.074
Smoking					1	0.063
Vaccination						1

IL, interleukin; TNF, tumor necrosis factor; *correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed)