

Thrombin formation via the intrinsic coagulation pathway and von Willebrand factor reflect disease severity in COVID-19

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Supplemental data

Table S1. Markers of coagulation and vascular damage in admitted patients with COVID-19 during the course of disease.

	Moderate		Severe		P value
	<i>n</i>	<i>median (IQR)</i>	<i>n</i>	<i>median (IQR)</i>	
FVIIa, mIU/mL					
Baseline	62	31.7 (20.0-47.6)	98	39.8 (20.4-55.3)	0.157
≤ 7 days	24	37.5 (19.3-48.9)	45	32.9 (21.0-48.1)	0.753
8 – 14 days	8	32.8 (22.1-43.1)	43	33.2 (21.9-45.7)	0.929
FVIIa:AT, pM					
Baseline	31	556 (476-741)	77	607 (458-784)	0.514
≤ 7 days	11	567 (524-844)	43	642 (540-1110)	0.335
8 – 14 days	4	704 (512-807)	27	710 (567-711)	0.842
PKa:C1Inh, nM					
Baseline	67	2.5 (0.9-4.8)	104	1.9 (1.0-3.5)	0.750
≤ 7 days	25	1.9 (1.0-4.7)	51	2.2 (1.0-14.4)	0.367
8 – 14 days	10	2.5 (1.8-5.7)	35	2.5 (1.1-10.4)	0.925
FXIa:AT, pM					
Baseline	67	25.7 (19.8-38.0)	104	30.0 (22.2-65.2)	0.004
≤ 7 days	25	21.3 (19.4-31.2)	51	37.8 (24.9-74.0)	0.001
8 – 14 days	10	20.6 (14.4-31.2)	35	31.7 (22.2-60.9)	0.024
FXIa:α1AT, pM					
Baseline	67	515 (396-751)	104	545 (402-806)	0.418
≤ 7 days	25	399 (340-569)	51	603 (442-905)	0.003
8 – 14 days	10	387 (312-661)	35	589 (491-860)	0.014
FIXa:AT, pM					
Baseline	67	64.2 (43.4-91.0)	104	86.8 (62.0-125.6)	<0.001
≤ 7 days	25	68.2 (49.9-94.3)	51	92.0 (74.8-128.1)	0.007
8 – 14 days	10	66.2 (51.1-74.6)	35	75.0 (60.3-108.0)	0.073
T:AT, ng/mL					
Baseline	67	5.5 (3.7-10.1)	104	8.7 (4.9-21.2)	<0.001
≤ 7 days	25	4.3 (2.8-9.3)	51	7.6 (5.2-21.5)	0.003
8 – 14 days	10	4.6 (3.8-5.1)	35	6.9 (4.9-12.2)	0.006
vWF:Ag, %					
Baseline	67	361 (263-488)	104	438 (342-557)	0.001
≤ 7 days	25	374 (295-498)	51	520 (397-633)	0.002
8 – 14 days	10	324 (245-420)	35	557 (461-594)	<0.001

Differences between groups were tested with the Mann Whitney U test.

Abbreviation: FVIIa, activated factor VIIa. AT, antithrombin. PKa, plasma kallikrein. C1INH, C1 esterase inhibitor. FXIa, activated factor XI. α1AT, α1-antitrypsin. FIXa, activated factor IX. T:AT, thrombin in complex with antithrombin. vWF:Ag, von Willebrand factor antigen.

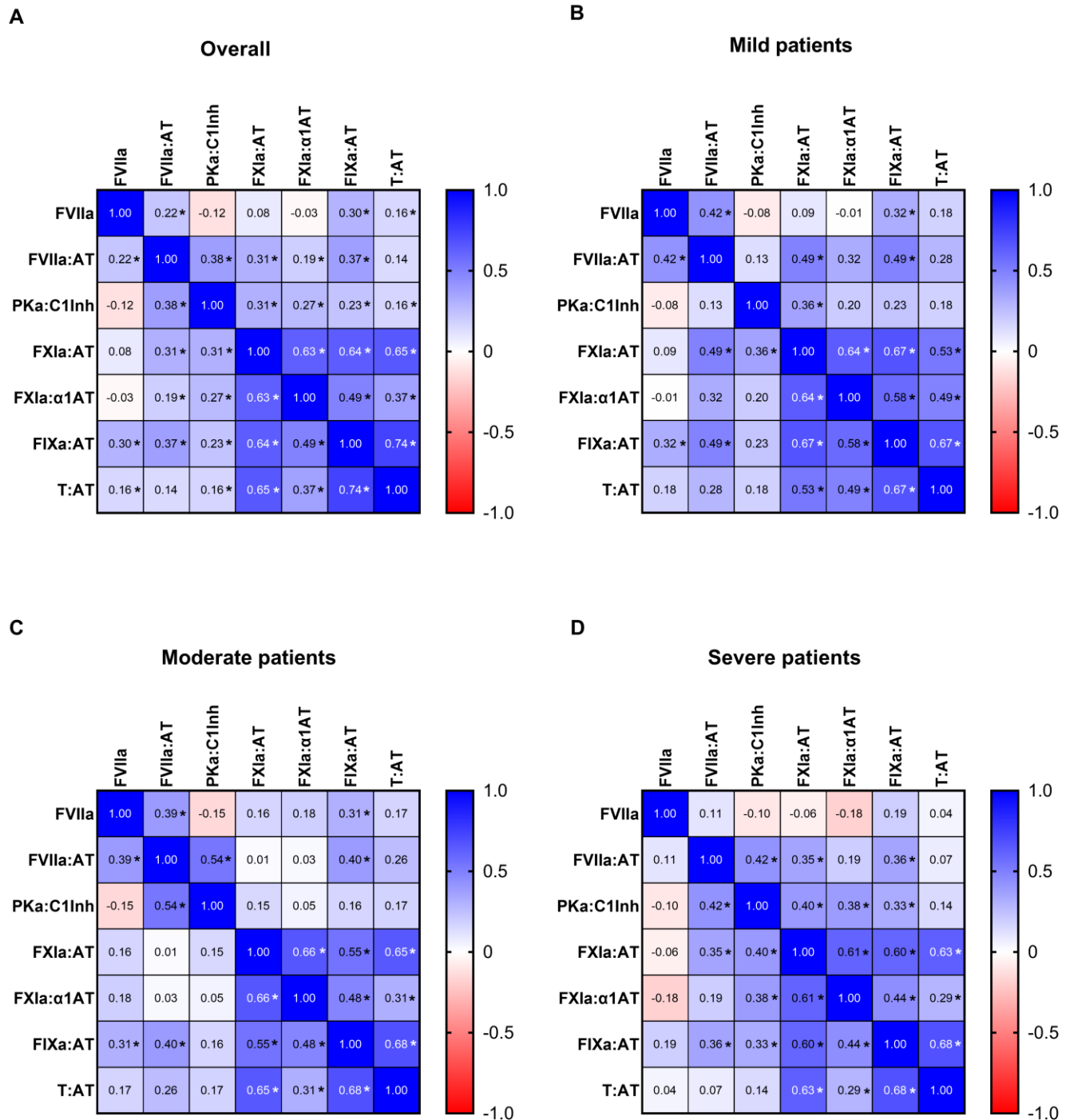
Table S2. Correlation matrix between CRP, neutrophil and lymphocyte counts, NLR as well as soluble C5a and coagulation factors as well as vWF:Ag at baseline in patients with COVID-19.

	CRP (mg/L)		Neutrophils (x10 ⁹ /L)		Lymphocytes (x10 ⁹ /L)		NLR		C5a (ng/mL)	
	Spearman's <i>r</i>	<i>P</i> value	Spearman's <i>r</i>	<i>P</i> value	Spearman's <i>r</i>	<i>P</i> value	Spearman's <i>r</i>	<i>P</i> value	Spearman's <i>r</i>	<i>P</i> value
FVIIa	0.07	0.329	0.05	0.510	0.06	0.459	-0.05	0.507	-0.14	0.052
FVIIa:AT	0.06	0.515	-0.05	0.605	-0.09	0.333	-0.01	0.944	-0.12	0.153
PKa:C1Inh	0.00	0.949	-0.04	0.562	-0.04	0.579	-0.01	0.922	-0.03	0.725
FXI:AT	0.22	0.002	0.11	0.135	-0.16	0.028	0.19	0.009	0.08	0.285
FXIa:α1AT	0.38	<0.001	0.14	0.055	-0.16	0.032	0.22	0.003	0.24	<0.001
FIX:AT	0.41	<0.001	0.21	0.005	-0.11	0.114	0.19	0.010	0.13	0.059
T:AT	0.35	<0.001	0.23	0.002	-0.11	0.141	0.20	0.006	0.18	0.011
vWF:Ag	0.38	<0.001	0.31	<0.001	-0.15	0.040	0.27	<0.001	0.16	0.021

Spearman rank correlation coefficients were used.

CRP, C-reactive protein. NLR, neutrophil-lymphocyte ratio. FVIIa, activated factor VIIa. AT, antithrombin. PKa, plasma kallikrein. C1INH, C1 esterase inhibitor. FXIa, activated factor XI. α1AT, α1-antitrypsin. FIXa, activated factor IX. T:AT, thrombin in complex with antithrombin. vWF:Ag, von Willebrand factor antigen.

Figure S1. Correlation matrix of baseline extrinsic and intrinsic coagulation factors in patients with COVID-19. Spearman rank correlation coefficients were calculated for all patients (A) and stratified by disease severity into mild (B), moderate (C), and severe patients (D).



*indicates a P value < 0.05 .

Abbreviation: FVIIa, activated factor VIIa. AT, antithrombin. PKa, plasma kallikrein. C1INH, C1 esterase inhibitor. FXIa, activated factor XI. α1AT, α1-antitrypsin. FIXa, activated factor IX. T:AT, thrombin in complex with antithrombin.