Association of the predictive risk scores of CALL points and COVID-GRAM with IL-6, duration of oxygen therapy, D-dimer among patients with COVID-19

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Background

· The coronavirus disease 2019 (COVID-19) outbreak has caused a global pandemic. Critically ill patients with COVID-19 can develop acute respiratory distress syndrome (ARDS) and thrombosis.
· Infection of hematopoietic cells results in secretion of interleukin (IL)-6 and other inflammatory cytokines. IL-6 and other inflammatory cytokines can cause ARDS and thrombosis. Elevated IL-6 levels are expected to cause more severe cytokine release syndrome[1].

· In this study, we investigated the association of the predictive risk scores of CALL points and COVID-GRAM with the IL-6 level, duration of oxygen therapy (DOT), and D-dimer level.

Discussion

· No previous study has shown the link between these two scores and IL-6 level.
· These predictive risk scores can help to estimate severe cytokine release syndrome caused by COVID-19.
· Further studies are needed to confirm this positive association and clinical significance of it.

Conclusion

· These predictive risk scores of CALL points and COVID-GRAM can be surrogate markers for the IL-6 level in patients with COVID-19.

Methods

· We enrolled 20 consecutive patients diagnosed with COVID-19 from April 3rd, 2020 to April 30th, 2020 and determined the predictive risk scores of CALL points [2] and COVID-GRAM [3] on admission.
· We statically analyzed the regressions between these two scores and the values of IL-6 and D-dimer and duration of oxygen therapy (DOT).

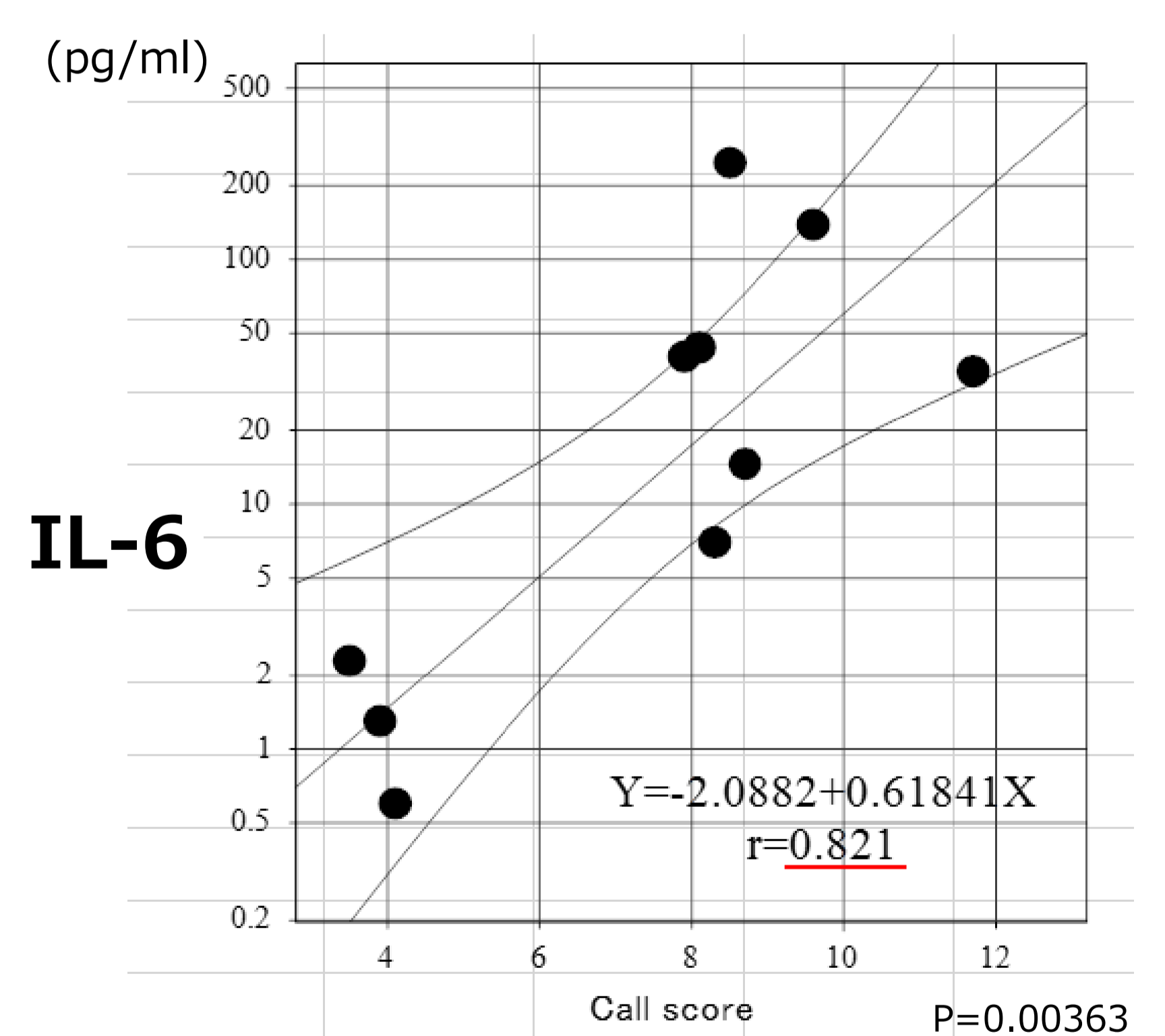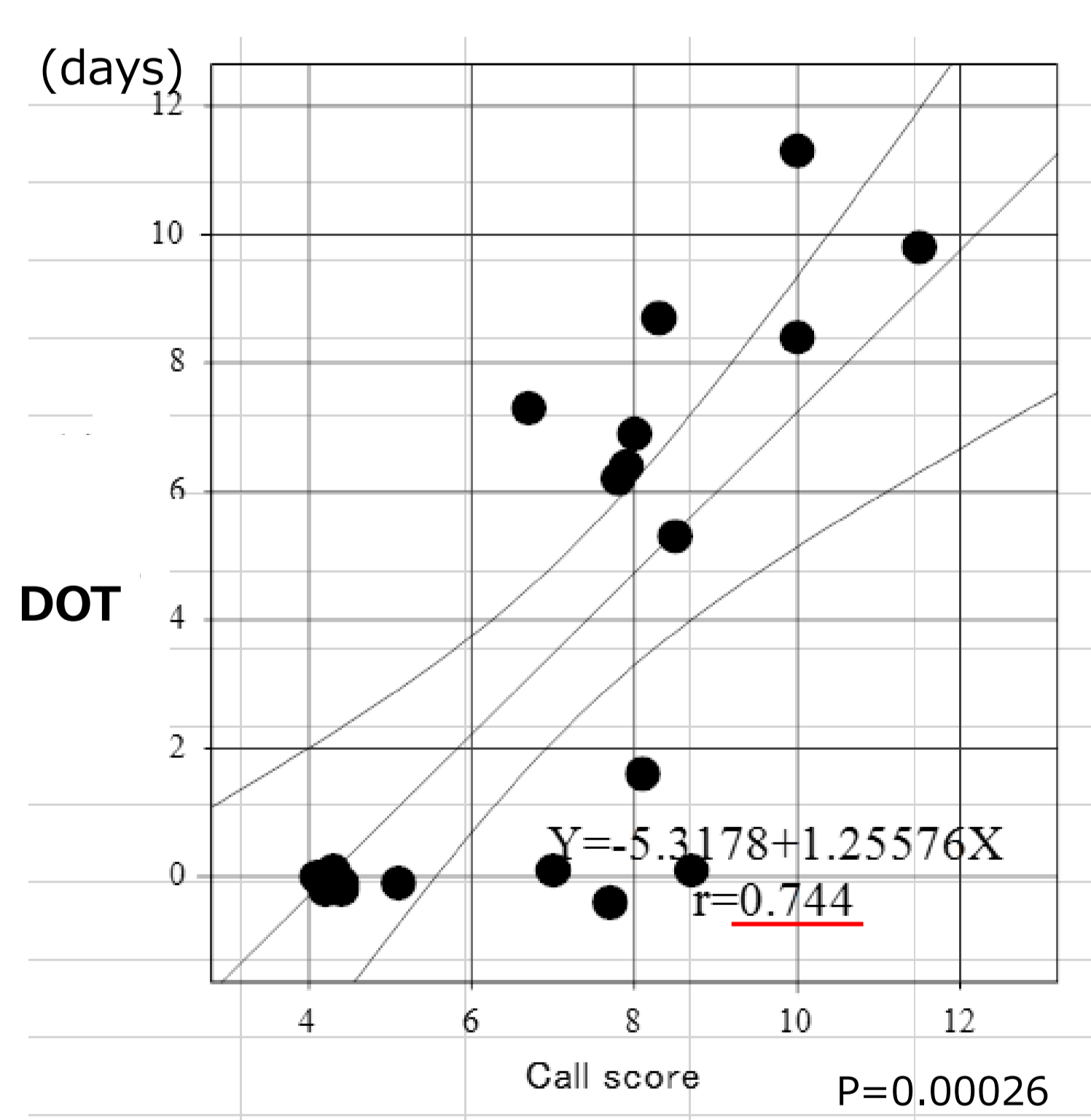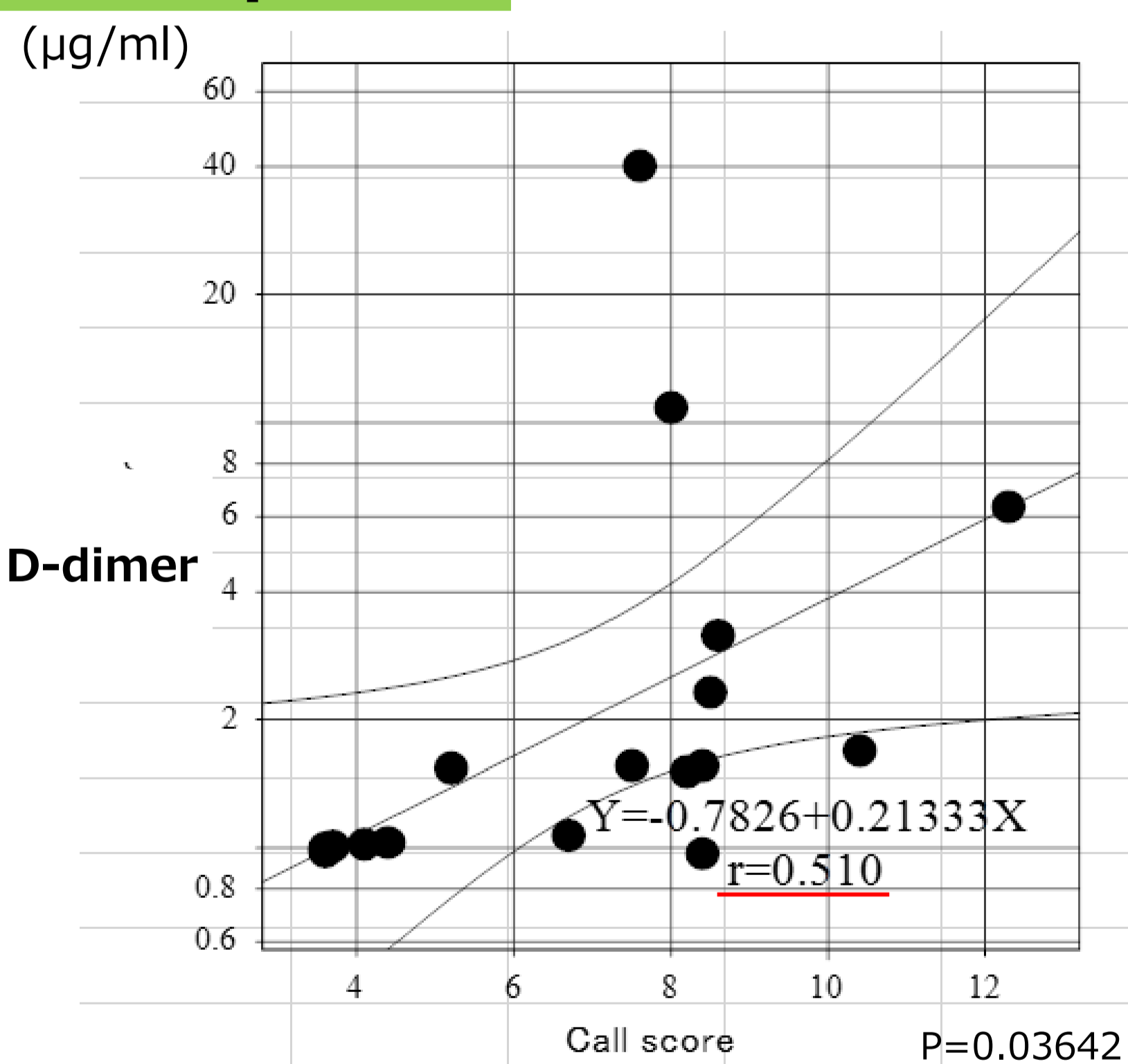CALL points: comorbidity, age, lymphocyte and LDH

COVID-GRAM: X ray abnormality, age, hemoptysis, dyspnea, unconsciousness, comorbidities, cancer history, neutrophil/lymphocytes, lactate dehydrogenase, direct bilirubin
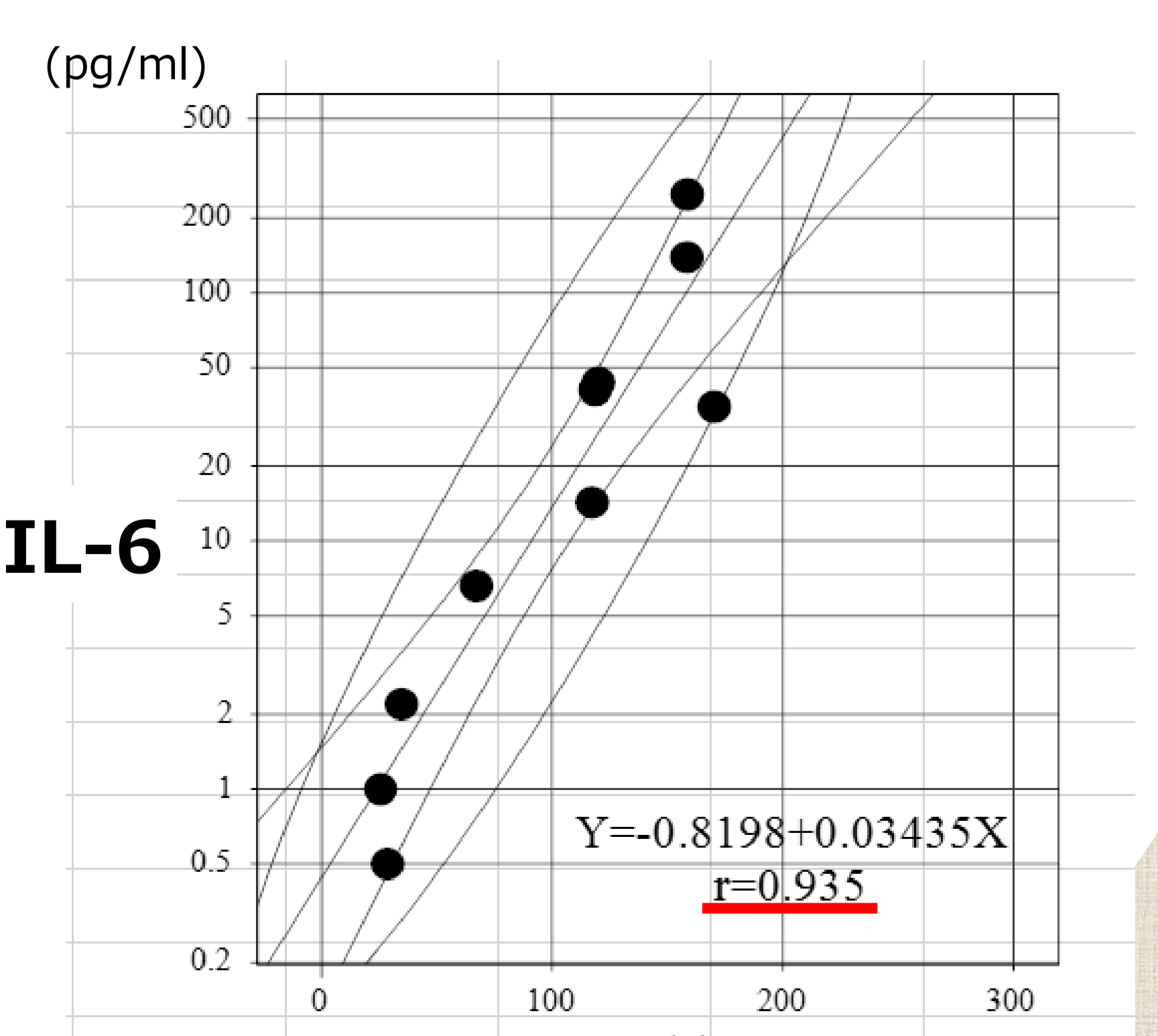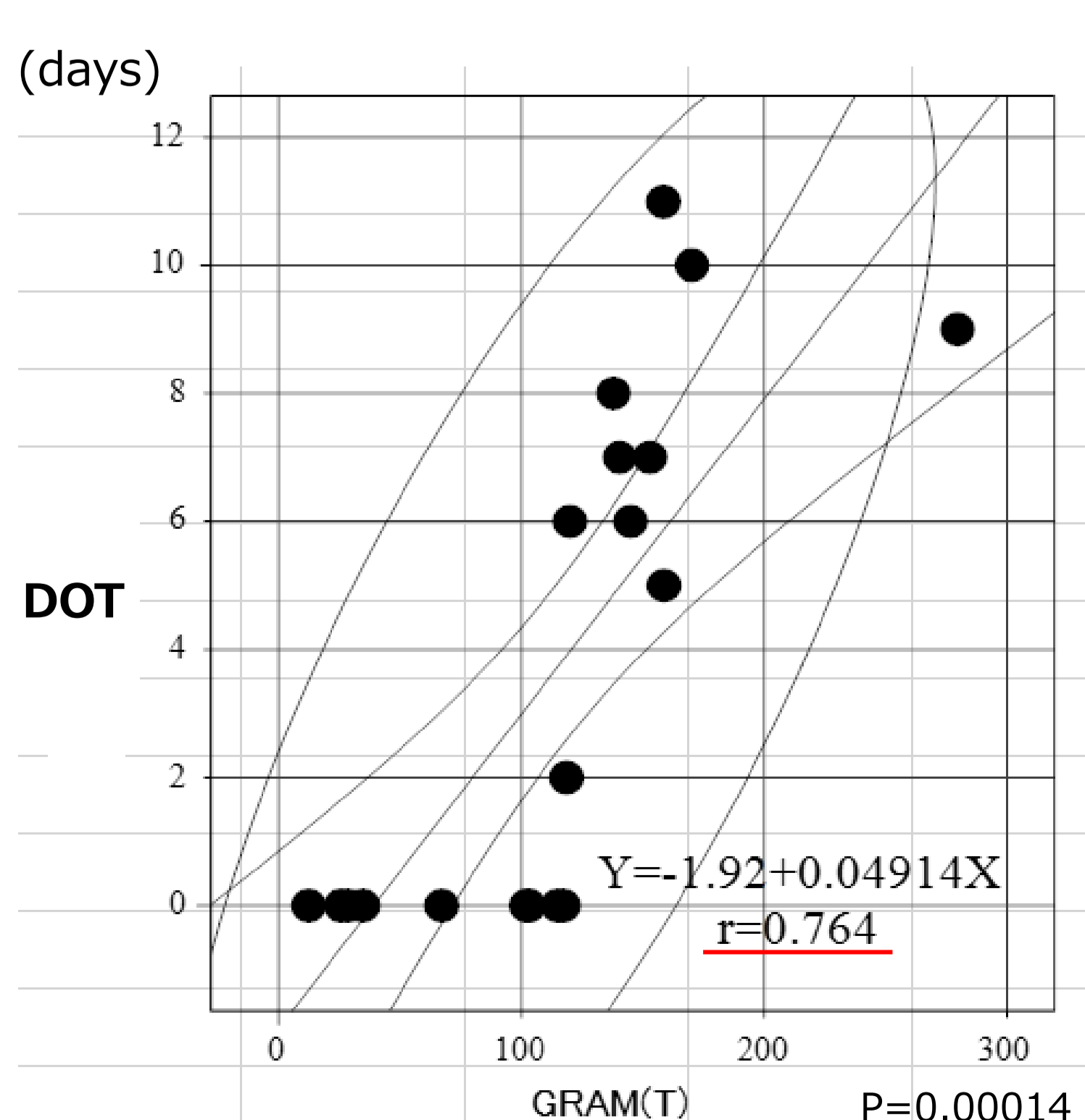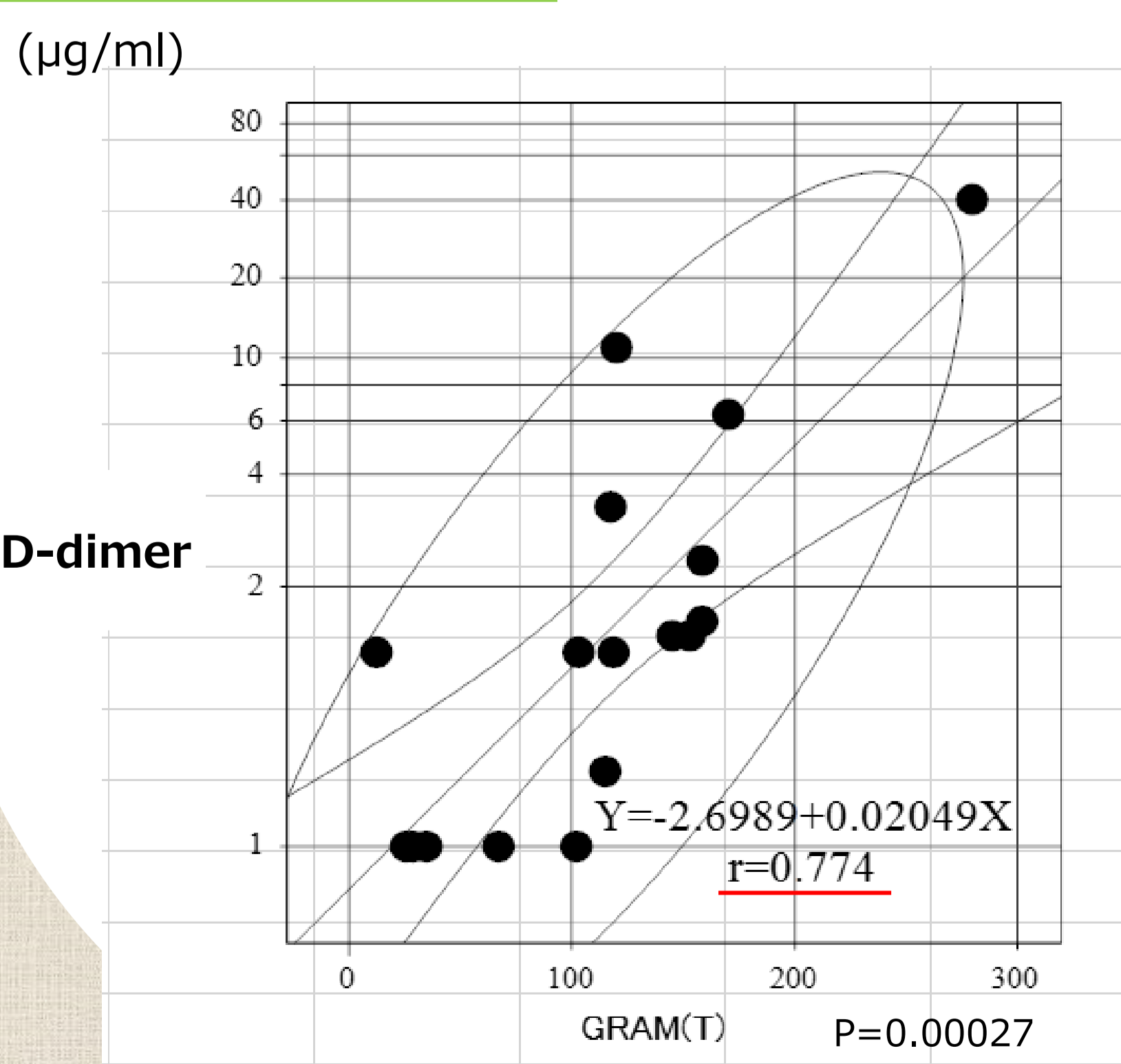
Results

patient	age	sex	comorbidity	CALL points	COVID-GRAM	D-dimer (µg/ml)	duration of oxygen therapy	IL-6 (pg/ml)
1	21	F	NA	4	0.0042	Under 1.0	0	1.0
2	21	M	NA	8	0.0267	Under1.0	0	6.6
3	22	M	NA	4	0.0048	Under1.0	0	0.5
4	22	M	NA	4	0.0064	Under1.0	0	2.2
5	27	F	Breast cancer (stage4),DM	4	0.1206	Under1.0	0	NA
6	41	M	DM	8	0.2176	1.5	2	40.6
7	50	F	NA	5	0.1212	1.5	0	NA
8	52	F	DM	8	0.9974	40.2	9	NA
9	52	M	NA	4	NA	Under1.0	0	NA
10	52	M	DM,HT	10	0.3984	1.4	8	NA
11	52	M	NA	8	0.2352	10.9	6	43.5
12	57	M	HT,CVD	10	0.6242	1.7	11	139
13	58	F	Uterine cancer (post operated),HT	8	0.5648	1.6	7	NA
14	60	M	NA	7	0.4267	2.3	7	NA
15	65	M	HT,DM,CVD	9	0.6262	2.3	5	249
16	66	F	HT	9	0.2077	3.2	0	14.3
17	67	M	HT	8	0.4814	1.6	6	NA
18	76	F	NA	7	0.1912	1.1	0	NA
19	77	M	HT	11	0.9537	1.5	0	NA
20	86	F	Breast cancer (post operated)	12	0.7386	6.3	10	34.7

Abbreviations NA, not applicable; DM, diabetes mellitus; HT, hypertension; CVD, cardiovascular disease

CALL points

(µg/ml) D-dimer vs Call score
Y=-0.7826+0.21333X
r=0.510
P=0.03642

(days) DOT vs Call score
Y=-5.3178+1.25576X
r=0.744
P=0.00026

(pg/ml) IL-6 vs Call score
Y=-2.0882+0.61841X
r=0.821
P=0.00363

COVID-GRAM

(µg/ml) D-dimer vs GRAM(T)
Y=-2.6989+0.02049X
r=0.774
P=0.00027

(days) DOT vs GRAM(T)
Y=-1.92+0.04914X
r=0.764
P=0.00014

(pg/ml) IL-6 vs GRAM(T)
Y=-0.8198+0.03435X
r=0.935
P=0.000007

【Conflict of Interest】

Conflict of interests is none.

【References】
(1) John B. Moore et al. Sience 2020 May 1;368(6490):473-474.
(2) Dong J et al. CID 2020 Sep 12;71(6):1393-1399.
(3) Liang W et al. JAMA Int. Med 2020 Aug 1;180(8):1081-1089.
(4) Copaescu A et al. J Allergy Clin Immunol 2020 Sep;146(3):518-534.e1.