SUPPLEMENTARY MATERIAL

DOI: 10.4081/monaldi.2024.2829

Diaphragmatic morphological *post-mortem* findings in critically ill COVID-19 patients: an observational study

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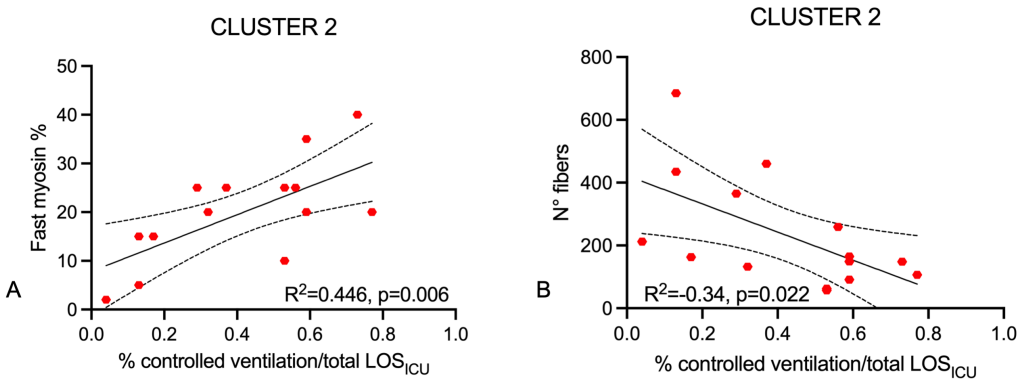
Key words: COVID-19, invasive mechanical ventilation, diaphragm dysfunction, myosin, ventilation-induce diaphragm injury.



Supplementary Figure 1. Fast fiber content and their number relationship with mechanical ventilation. Fast myosin content showed a positive linear correlation with the percentage of controlled mechanical ventilation on total LOS_{ICU} (R^2=0.446, p=0.006 as shown in panel A). On the opposite, their number decreased regarding the same ventilation parameters (R^2=-0.34, p=0.022 as shown in panel B).

Supplementary table 1. Pre-existing conditions and relevant medical history

	OVERALL (n = 29)	CLUSTER 1 (n = 14)	CLUSTER 2 (n=15)	P value
Cardiovascular	19 (65%)	9 (64%)	10 (66%)	>0.99
COPD	4 (14%)	2 (14%)	2 (13%)	>0.99
DM type 2	6 (21%)	4 (28%)	2 (13%)	0.38
Dyslipidemia	4 (14%)	2 (14%)	2 (13%)	>0.99
CKD	4 (14%)	2 (14%)	2 (13%)	>0.99
Solid neoplasia	1 (3.5%)	-	1 (6.5%)	>0.99
Other	11 (38%)	6 (43%)	5 (33%)	0.71

COPD, chronic obstructive pulmonary disease; DM, diabetes; CKD, chronic kidney disease.

Supplementary table 2. Correlations between ventilatory parameters and anatomopathological findings.

Correlations		CLUSTER 1	CLUSTER 2
% time under assisted ventilation and	slow myosin fibers%	R^2=-0.025, p=0.584	R^2=0.001, p=0.983
	fast myosin fibers %	R^2=-0.355, p=0.014	R^2=0.246, p=0.059
	n° of fibers	R^2=0.001, p=0.839	R^2=-0.115, p=0.216
	CSA	R^2=0.006, p=0.804	R^2=-0.028, p=0.544
	Perimeter	R^2=0.01, p=0.723	R^2=-0.011. p=0.709
	Diameter	R^2=0.025, p=0.584	R^2=-0.022, p=0.596
	Fraction	R^2=-0.211, p=0.095	R^2=0.282, p=0.041
% time under controlled ventilation and	slow myosin fibers%	R^2=-0.025, p=0.586	R^2=-0.001, p=0.921
	fast myosin fibers %	R^2=0.003, p=0.834	R^2=0.446, p=0.006
	n° of fibers	R^2=0.013, p=0.689	R^2=-0.34, p=0.022
	CSA	R^2=-0.085, p=0.310	R^2=0.000, p=0.995
	Perimeter	R^2=-0.097, p=0.277	R^2=0.006, p=0.773
	Diameter	R^2=-0.106, p=0.255	R^2=0.008, p=0.738
	Fraction	R^2=0.015, p=0.671	R^2=0.100, p=0.249
% time under pronation and	slow myosin fibers%	R^2=-0.005, p=0.799	R^2=-0.08, p=0.288
	fast myosin fibers %	R^2=-0.015, p=0.672	R^2=0.046, p=0.441
	n° of fibers	R^2=-0.218, p=0.092	R^2=-0.263, p=0.060
	CSA	R^2=-0.24, p=0.075	R^2=-0.031, p=0.529
	Perimeter	R^2=-0.247, p=0.07	R^2=-0.010, p=0.710
	Diameter	R^2=-0.257, p=0.064	R^2=-0.014, p=0.664
	Fraction	R^2=0.096, p=0.280	R^2=0.439, p=0.007
% time under sedation and	slow myosin fibers%	R^2=-0.014, p=0.682	R^2=-0.034, p=0.508
	fast myosin fibers %	R^2=-0.429, p=0.011	R^2=0.248, p=0.058
	n° of fibers	R^2=0.023, p=0.599	R^2=-01.58, p=0.142
	CSA	R^2=-0.127, p=0.21	R^2=0.001, p=0.946
	Perimeter	R^2=-0.144, p=0.180	R^2=0.003, p=0.825
	Diameter	R^2=0.125, p=0.213	R^2=0.001, p=0.890
	Fraction	R^2=0.037, p=0.504	R^2=0.06, p=0.378
% time under curarization and	slow myosin fibers%	R^2=-0.01, p=0.732	R^2=-0.184, p=0.11
	fast myosin fibers %	R^2=-0.004, p=0.824	R^2=0.001, p=0.932
	n° of fibers	R^2=-0.077, p=0.333	R^2=0.039, p=0.479
	CSA	R^2=-0.078, p=0.330	R^2=0.091, p=0.272
	Perimeter	R^2=-0.071, p=0.354	R^2=0.118, p=0.208

	Diameter	R^2=-0.06, p=0.397	R^2=0.129, p=0.187
	Fraction	R^2=0.028, p=0.563	R^2=-0.031, p=0.526
Tidal volume (based on IBW) and	**slow myosin fibers%**	R^2=-0.005, p=0.799	R^2=0.026, p=0.565
	fast myosin fibers %	R^2=-0.37, p=0.022	R^2=0.312, p=0.046
	n° of fibers	R^2=0.016, p=0.659	R^2=0.008, p=0.74
	CSA	R^2=0.013, p=0.691	R^2=-0.001, p=0.956
	Perimeter	R^2=0.022, p=0.611	R^2=0.004, p=0.822
	Diameter	R^2=0.028, p=0.566	R^2=0.002, p=0.851
	Fraction	R^2=0.057, p=0.41	R^2=0.065, p=0.358
PEEP and	**slow myosin fibers%**	R^2=0.009, p=0.974	R^2=-0.088, p=0.282
	fast myosin fibers %	R^2=0.010, p=0.743	R^2=0.054, p=0.40
	n° of fibers	R^2=-0.038, p=0.50	R^2=0.054, p=0.40
	CSA	R^2=0.020, p=0.623	R^2=0.027, p=0.558
	Perimeter	R^2=0.028, p=0.499	R^2=0.028, p=0.544
	Diameter	R^2=0.062, p=0.387	R^2=0.025, p=0.57
	Fraction	R^2=-0.034, p=0.522	R^2=0.001, p=0.952
PaO2/FiO2 and	**slow myosin fibers%**	R^2=-0.089, p=0.344	R^2=0.012, p=0.688
	fast myosin fibers %	R^2=0.016, p=0.695	R^2=0.001, p=0.936
	n° of fibers	R^2=0.514, p=0.004	R^2=-0.007, p=0.766
	CSA	R^2=-0.005, p=0.825	R^2=0.016, p=0.644
	Perimeter	R^2=-0.004, p=0.834	R^2=0.006, p=0.779
	Diameter	R^2=0.001, p=0.973	R^2=0.002, p=0.859
	Fraction	R^2=-0.153, p=0.208	R^2=0.051, p=0.414
MP and	**slow myosin fibers%**	R^2=-0.031, p=0.623	R^2=-0.086, p=0.288
	fast myosin fibers %	R^2=-0.459, p=0.031	R^2=0.219, p=0.078
	n° of fibers	R^2=-0.739, p=0.414	R^2=-0.013, p=0.676
	CSA	R^2=0.003, p=0.866	R^2=0.110, p=0.225
	Perimeter	R^2=0.008, p=0.795	R^2=0.146, p=0.158
	Diameter	R^2=0.089, p=0.771	R^2=0.155, p=0.145
	Fraction	R^2=-0.021, p=0.685	R^2=-0.013, p=0.677

CSA, cross sectional area; IBW, ideal body weight; PEEP, positive end expiratory pressure; MP, mechanical power.