34.1 - Exercise Testing

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Impact of COVID-19 infection on a physically active population: evaluation functional using the Cardiopulmonar Exercise Test (CPET)

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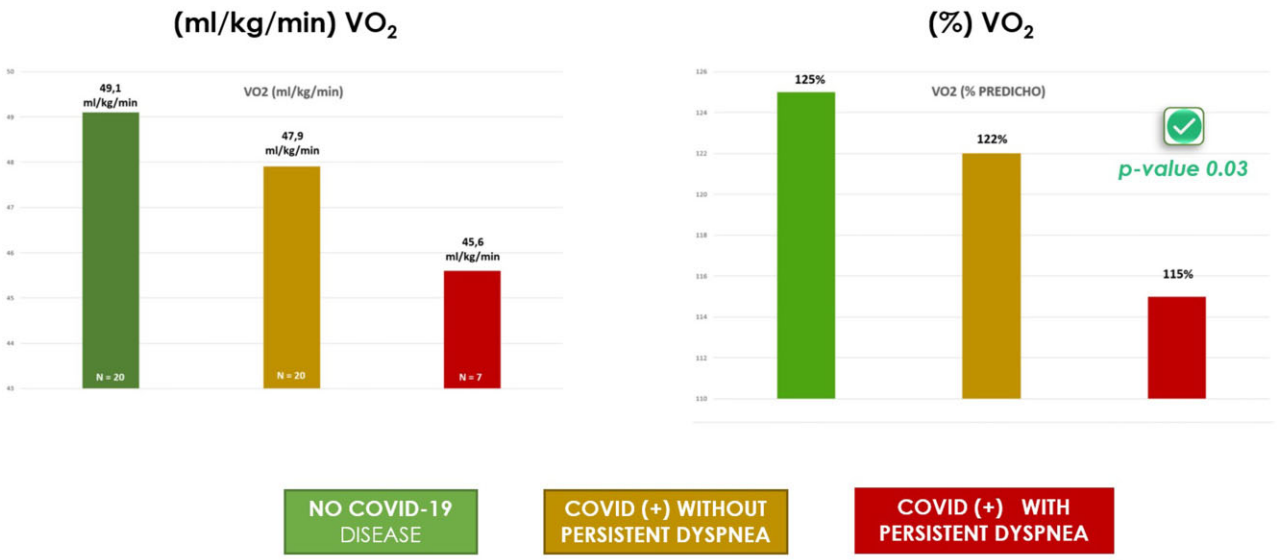
Introduction: An increase it is being seen in patients who are referred for consultation due to dyspnea persistent after having overcome COVID19. The cause for this sequel is still not entirely clear, but our group has observed -in another study- that the consumption of oxygen (VO2) determined by cardiopulmonar exercise test (CPET) in these patients is low with respect to its predicted (p50). The objective of the present work was to demonstrate this hypothesis against to a control group with similar characteristics, who have not suffered from COVID19.

Methods: We conducted a prospective study with military personnel who are part of a corps of army elite. All subjects have performed the same training daily during the last 2 years. They were divided into 3 groups: the first (G1) made up of those who had not suffered from the COVID19 disease; a second group (G2) that had suffered from it, but did not report impairment of functional class (CF); and a third group (G3) who maintained dyspnea persistent 3 months after suffering from the disease. Analytical with NT-proBNP, echocardiogram, basal spirometry, and CPET were performed. None required hospital admission.

Results: 36 subjects were included, distributed as follows: G1 (n = 14), G2 (n = 15), G3 (n = 7). The 3 groups had a similar age and BMI. None of the subjects presented alterations in baseline spirometry, neither structural heart disease in the echo, and nor relevant analytical alterations, being NT-proBNP less than 125 pg/ml in all of them. In relation to the response variables cardiovascular, statistical differences (p = 0.03) were observed in peak oxygen consumption predicted among the three groups (% predicted peak VO2), being significantly lower in the G3 subjects. In addition, a trend was observed -in absolute values- of peak VO2 to be lower in G3 -not significant probably due to the small sample size-. They were not objectified significant differences in PulseO2, nor in OUES. No patient presented alterations in the ventilatory efficiency parameters, or in final BR.

Conclusions: In our sample, patients who remained with persistent dyspnea after COVID-19, have a lower functional capacity compared to healthy subjects of the same characteristics, and with respect to subjects who after COVID19 do not present any symptoms. This subjective deterioration of the FC can be objectively quantified using CPET, thus reaffirming its value in this context.



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	NO COVID-19 n = 15 pacientes	COVID-19 sin DISNEA PERSISTENTE n = 14 pacientes	COVID-19 con DISNEA PERSISTENTE n = 7 pacientes	Valor P
CARACTERÍSTICAS EPIDEMIOLÓGICAS				
EDAD	28.7 (25.9 – 31.5)	27.0 (25.9 – 32.2)	25.8 (23.0 – 29.5)	0.64
IMC	26.1 (25.1 – 26.8)	24.6 (23.9 – 27.7)	25.5 (23.8 – 27.8)	0.92
ESPIROMETRÍA				
TIPO DE PATRÓN - Patrón Normal - Patrón Restrictivo - Patrón Obstructivo	15 (100) 0 0	14 (100) 0 0	7 (100) 0 0	1.00
TIEMPO DE EJERCICIO				
VARIABLES ERGOESPIROMETRÍA (CPET)				
Prueba Máxima	12 (12-13)	12 (11-13)	11 (10-12)	0.056
RER pico	1.17 (1.09 - 1.2)	1.2 (1.12 – 1.27)	1.18 (1.16 – 1.3)	0.45
Respuesta Cardiovascular				
VO2 pico	48.1 (45.7 – 51.5)	50.1 (44.5 – 51.9)	44.9 (41.5 – 49.2)	0.23
VO2 pico (% predicho)	**1.24 (1.21 – 1.31)**	**1.21 (1.16 – 1.34)**	**1.12 (1.11 – 1.16)**	**0.03**
Pulso O2 pico	21.3 (18.3 – 22.5)	20.8 (19.5 – 21.8)	18.6 (17.6 – 21.8)	0.25
Pulso O2 pico (% predicho)	16.4 (15.8 – 17.3)	16.6 (15.7 – 17.1)	16.6 (16.2 – 17.8)	0.88
VO2 en VT1 (% predicho)	0.73 (0.67 - .78)	0.75 (0.66 – 0.78)	0.7 (0.67 – 0.76)	0.72
OUES	4.11 (3.42 – 4.42)	3.74 (3.24 – 4.4)	3.7 (3.3 – 4.18)	0.67
OUES (% predicho)	1.32 (1.17 – 1.44)	1.29 (1.04 – 1.5)	1.29 (1 – 1.43)	0.85
% Consumo de O2 en minuto 2' (Deuda O2)	0.43 (0.42 – 0.49)	0.48 (0.45 – 0.54)	0.44 (0.41 – 0.48)	0.32
Eficiencia Ventilatoria				
VE/VCO2 slope	27.4 (25.1 – 30.2)	26.4 (24 – 29.1)	25.4 (25 – 26.3)	0.60
PETCO2 basal	34 (32 – 36)	35.5 (34 – 37)	35 (31 – 39)	0.20
PETCO2 en VT1	40 (38 – 44)	41.5 (39 – 43)	40 (40 – 41)	0.75
PETCO2 final	36 (34 – 37)	38 (36 – 38)	35 (33 – 39)	0.14
EqCO2 en VT1	27.3 (24.6 – 28.7)	26.1 (24.4 – 28.7)	26.1 (26 – 27)	0.65
EqO2 final	38.2 (34.8 – 41.7)	37.7 (35.9 – 39.8)	38.4 (35.1 – 45.4)	0.86
Otras				
BR (%)	0.2 (0 – 0.15)	0.09 (0.6 – 0.1)	0.06 (0.02 – 0.11)	0.35
INDUCCIÓN DE ISQUEMIA / ARRITMIAS				
ECG (+) para Isquemia	0 (0.0%)	0 (0.0%)	0 (0.0%)	NA
CLÍNICA (+) para Isquemia	0 (0.0%)	0 (0.0%)	0 (0.0%)	NA
CPET (+) "Belladinelli" para Isquemia	0 (0.0%)	0 (0.0%)	0 (0.0%)	NA
Arritmias	0 (0.0%)	0 (0.0%)	0 (0.0%)	NA
RESPUESTAS HEMODINÁMICAS				
FC basal	77 (60 – 89)	73.5 (69 – 83)	78 (75 – 100)	0.41
FC final	191 (186 – 198)	183.5 (176 – 192)	188 (176 – 192)	0.12
IRFC	18 (16 – 21)	15.5 (11 – 20)	12 (11 – 22)	0.23