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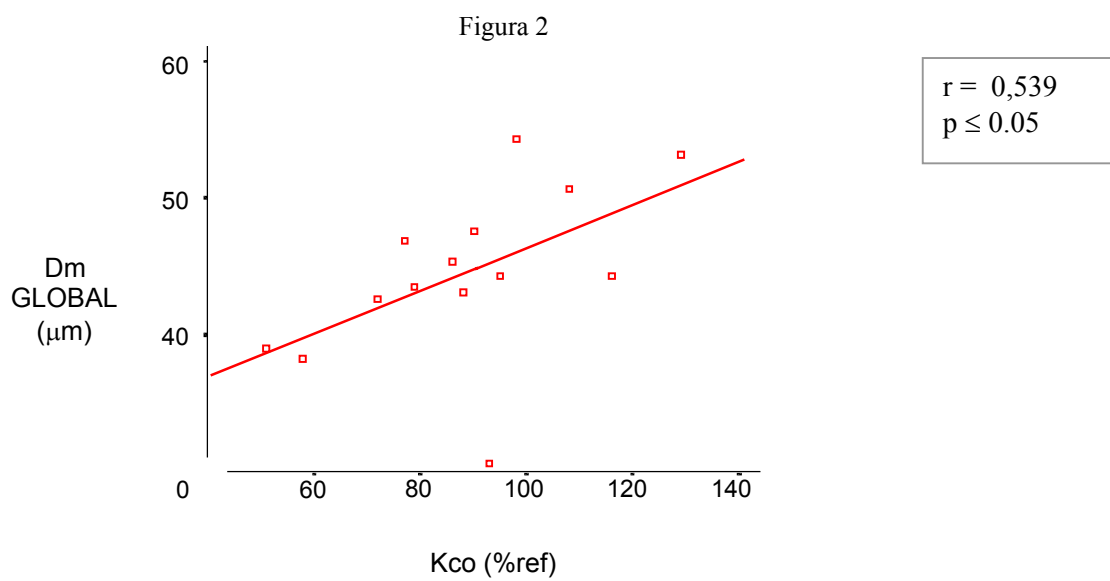
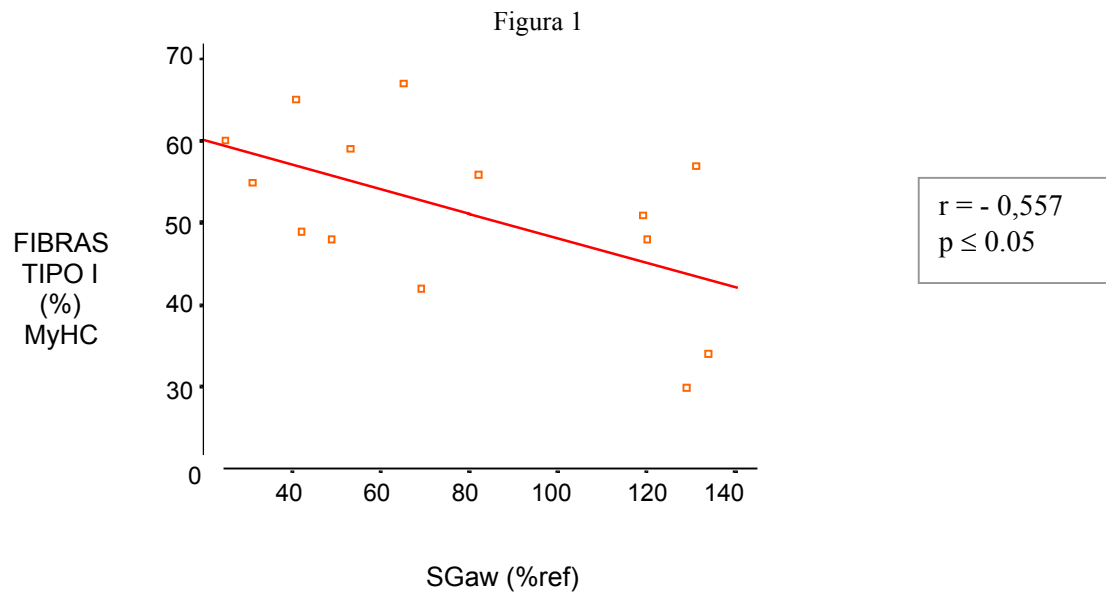
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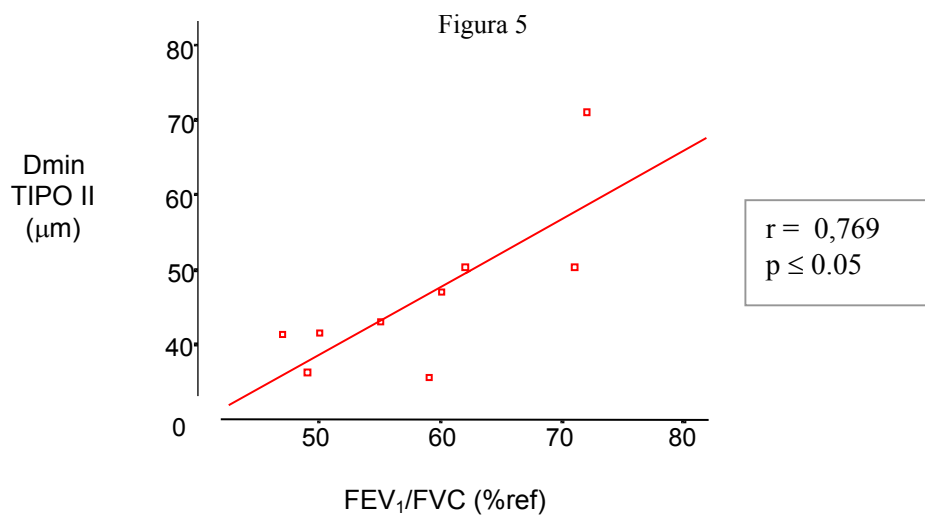
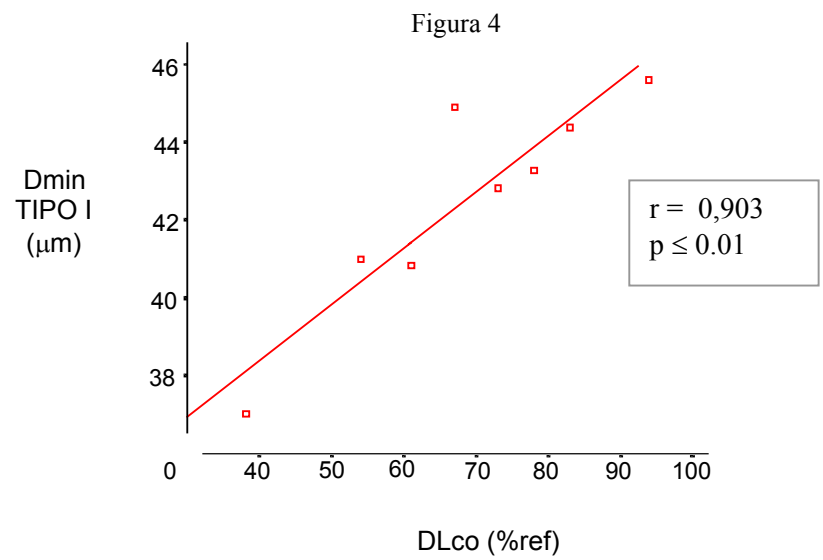
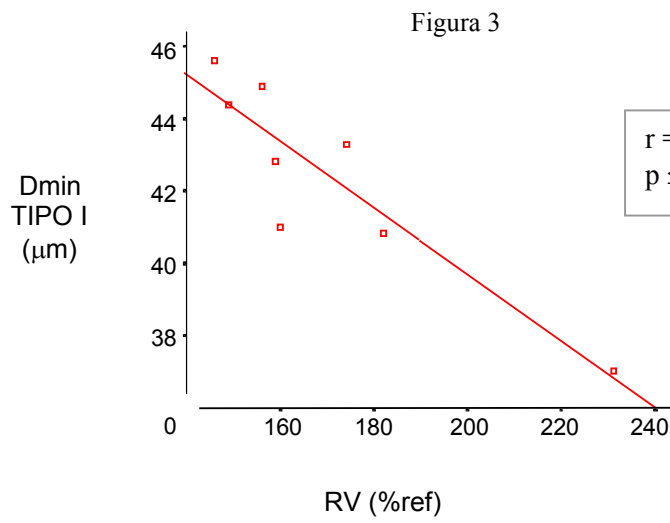
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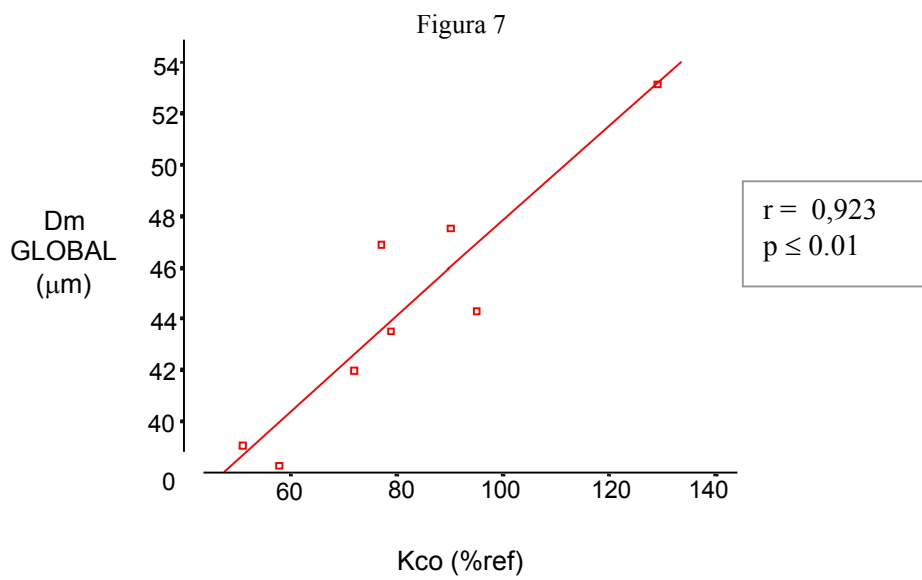
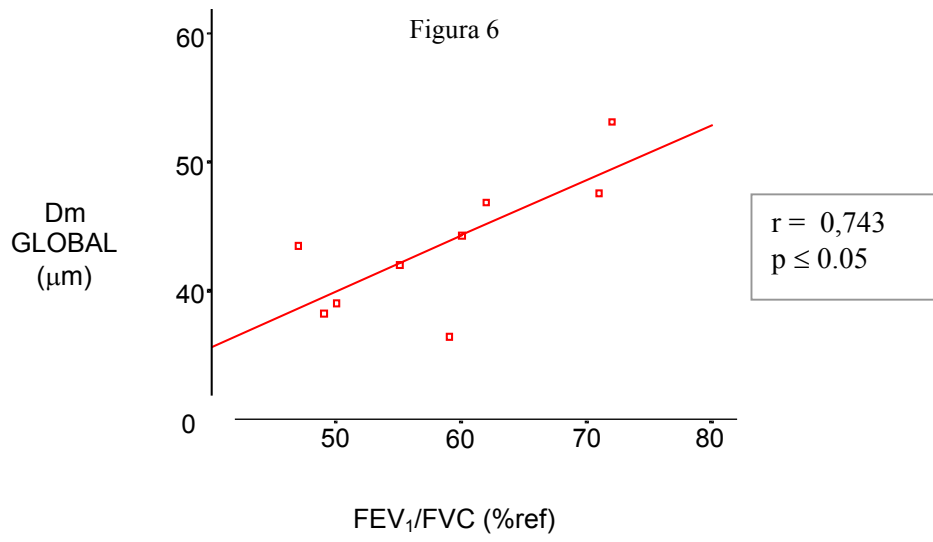
*Estructura fibrilar con función pulmonar (población total)*





*Estructura fibrilar con función pulmonar (exclusivamente pacientes con EPOC)*





*Actividad enzimática con función pulmonar (Población total)*

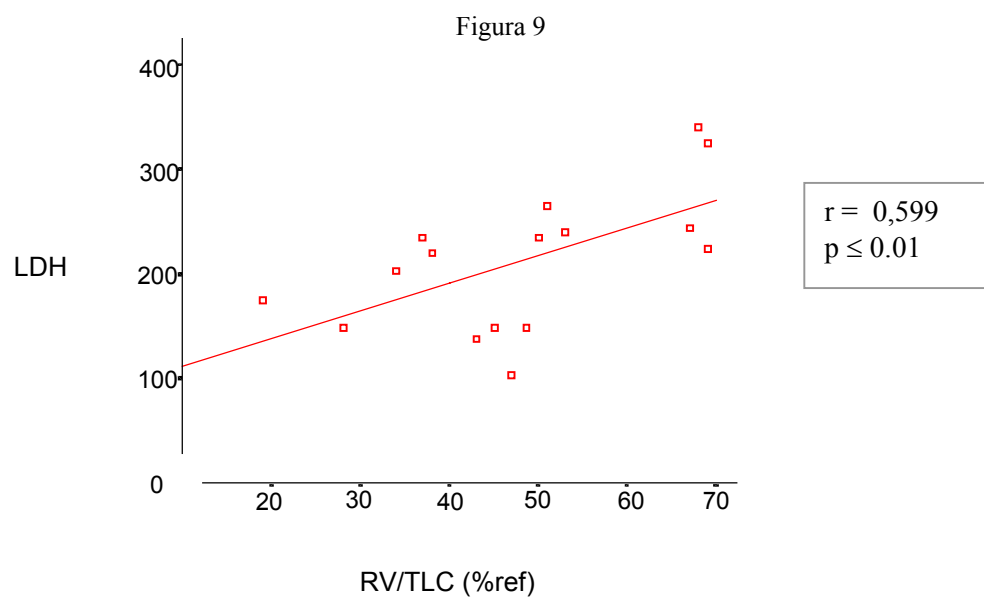
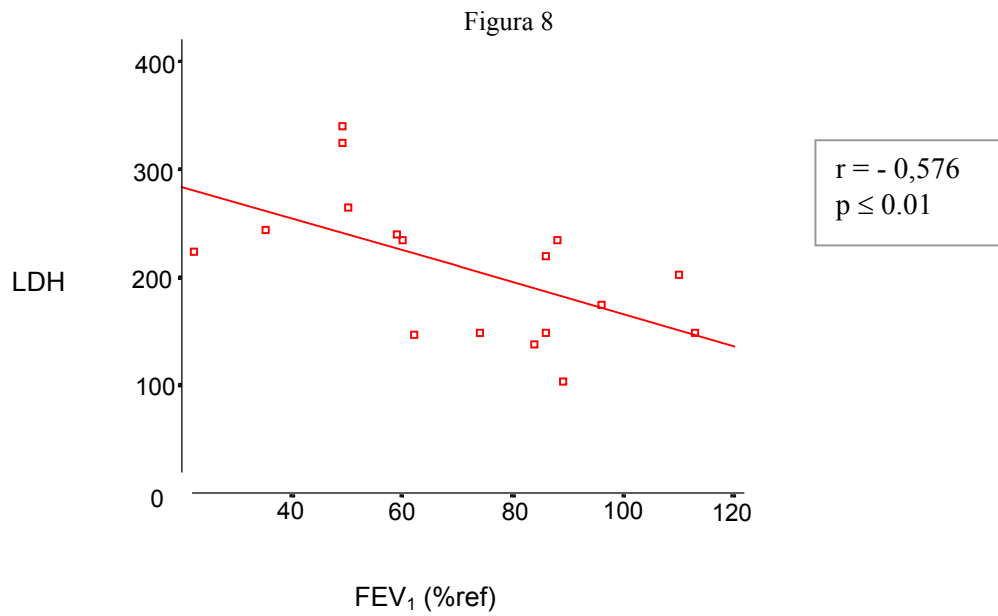


Figura 10

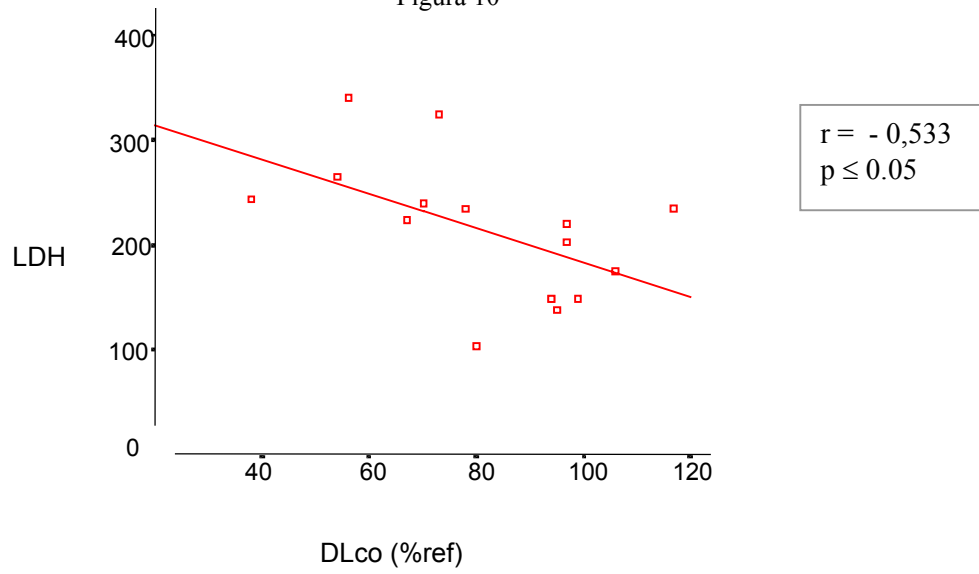
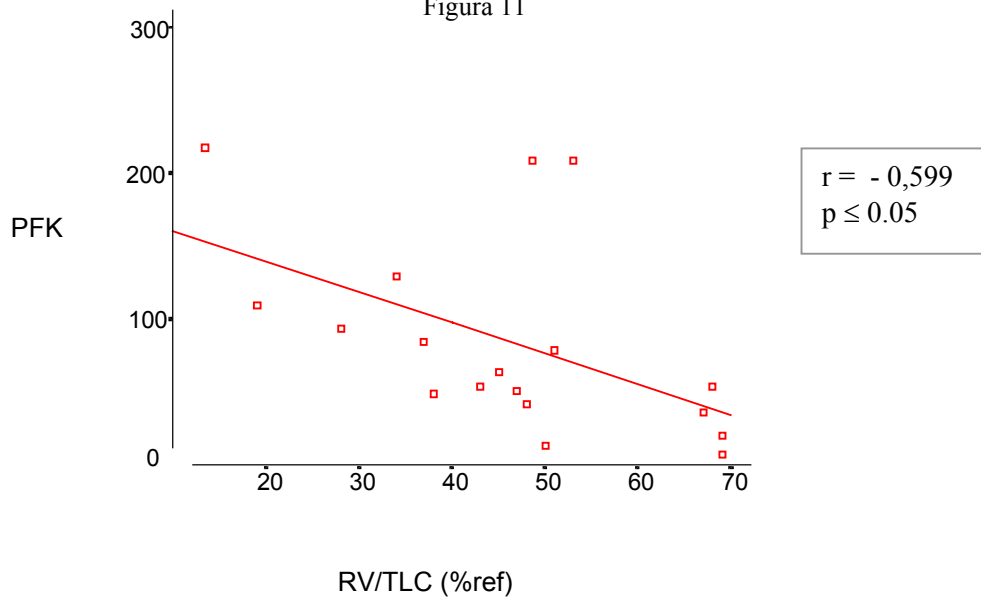
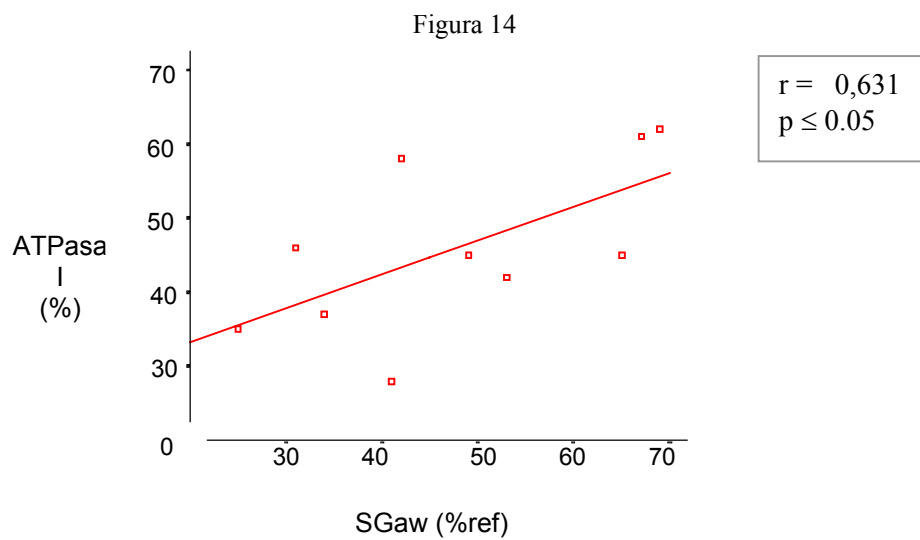
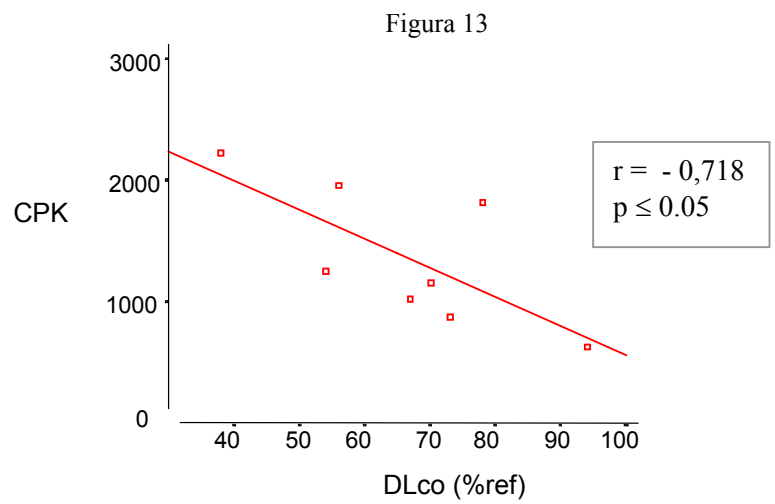
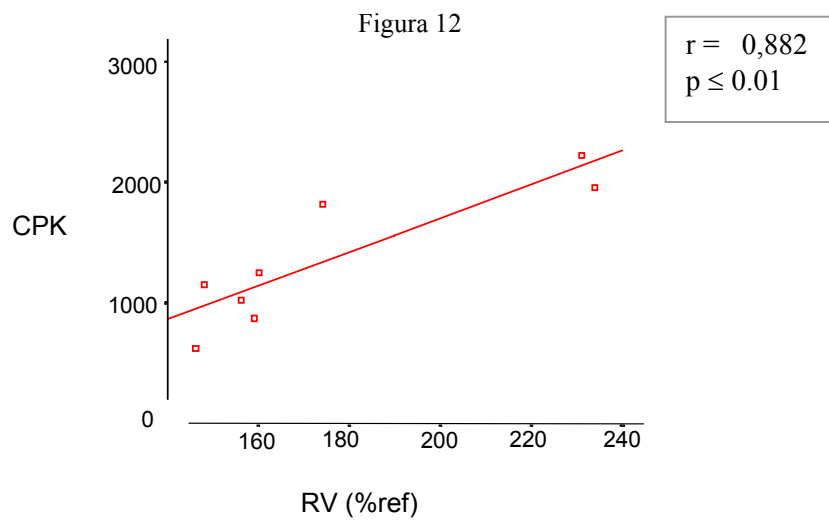


Figura 11



*Actividad enzimática con función pulmonar (exclusivamente pacientes con EPOC)*



*Densidad capilar con función pulmonar (Población total)*

Figura 15

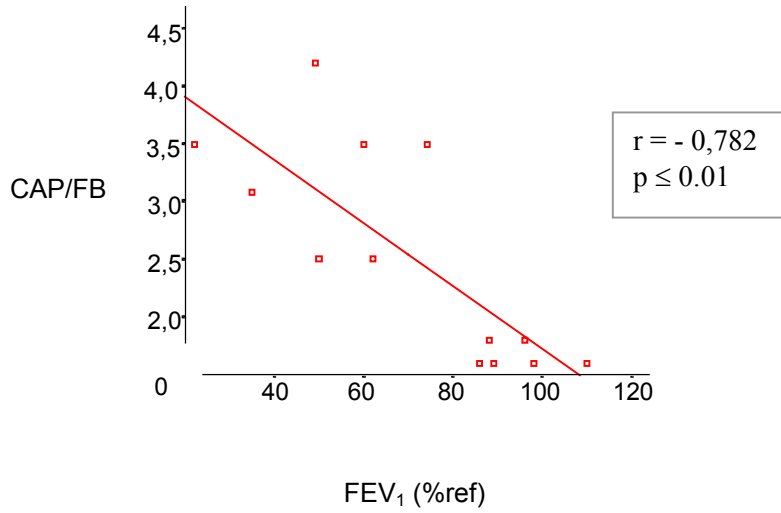


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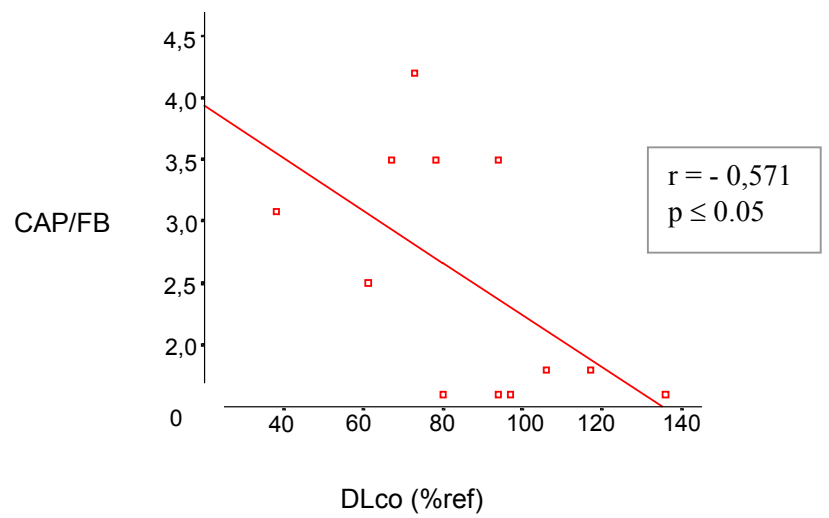


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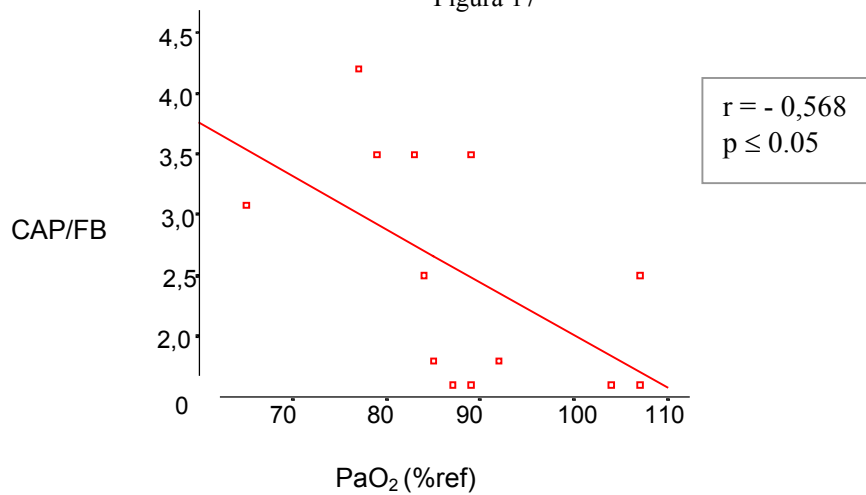
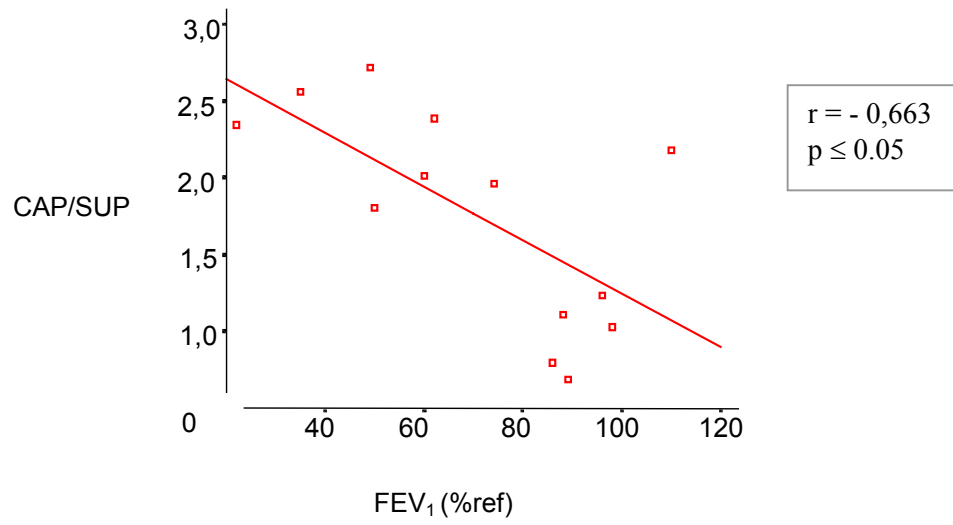
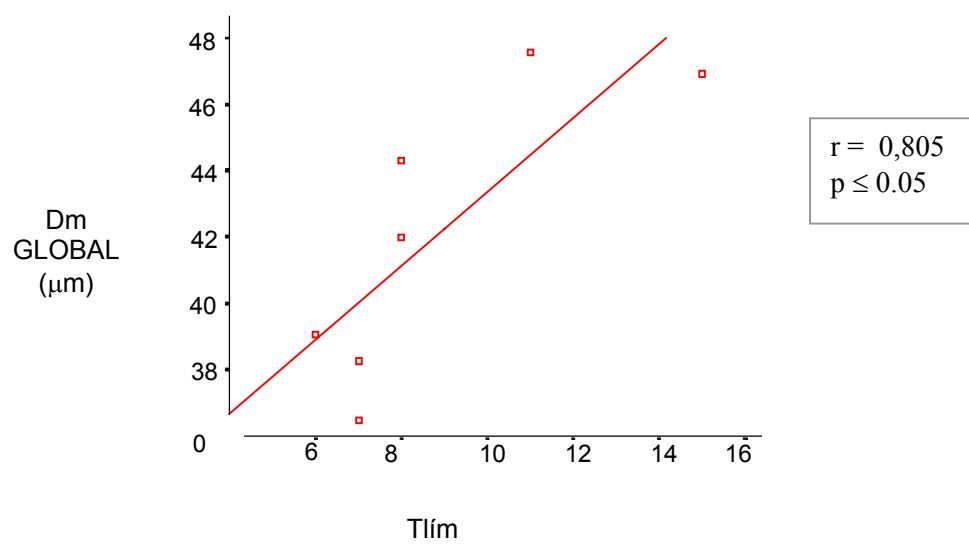


Figura 18



*Estructura fibrilar con función muscular y capacidad de ejercicio (exclusivamente pacientes con EPOC)*

Figura 19



*Función muscular y capacidad de ejercicio con actividad enzimática (Población total)*

Figura 20

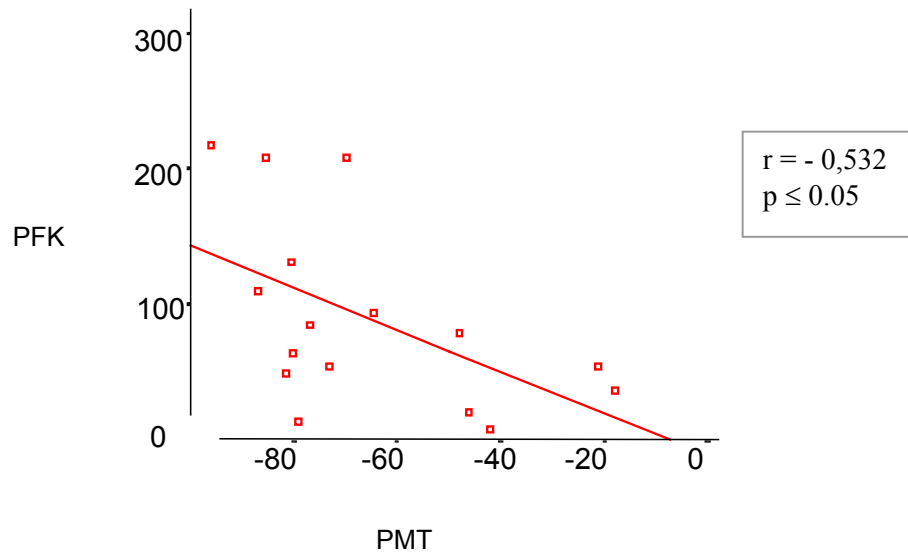
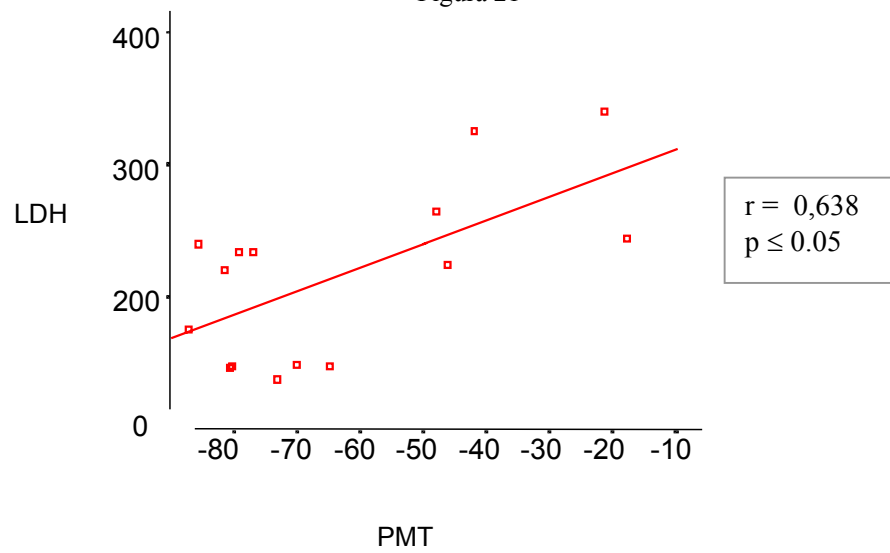


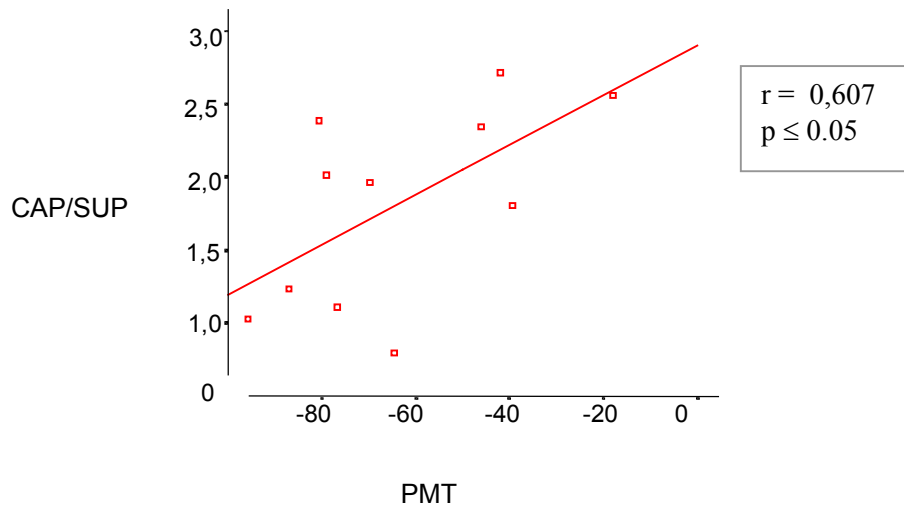
Figura 21





*Densidad capilar con función muscular y capacidad de ejercicio (Población total)*

Figura 22



*Estructura fibrilar con metabolismo (actividad oxidativa) (Población total)*

Figura 23

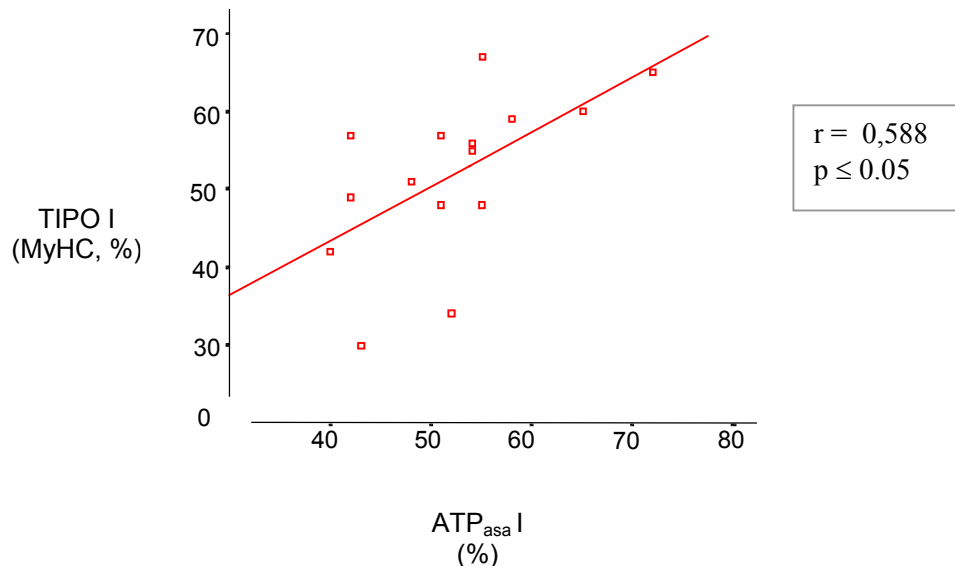
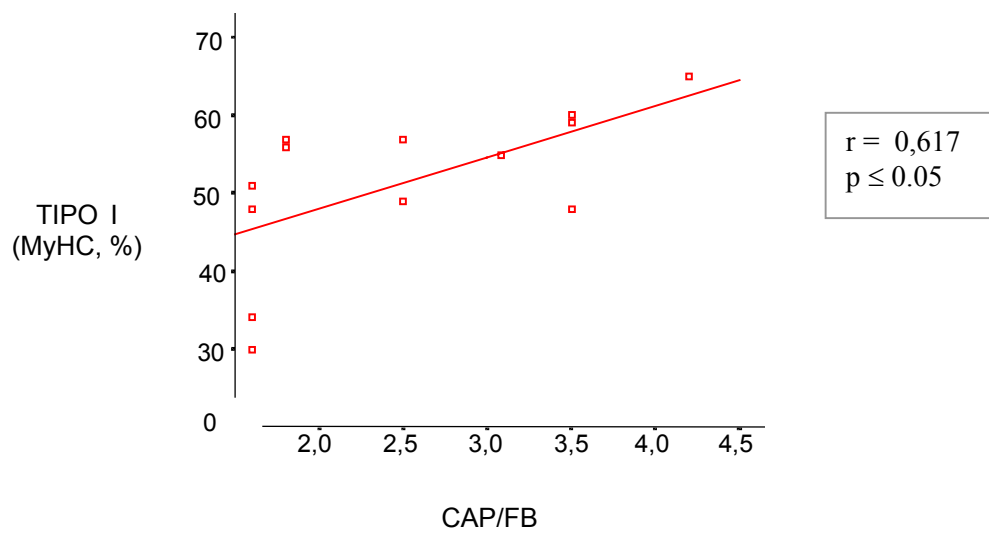


Figura 24



*Estructura fibrilar con metabolismo (actividad oxidativa) (exclusivamente en pacientes con EPOC)*

Figura 25

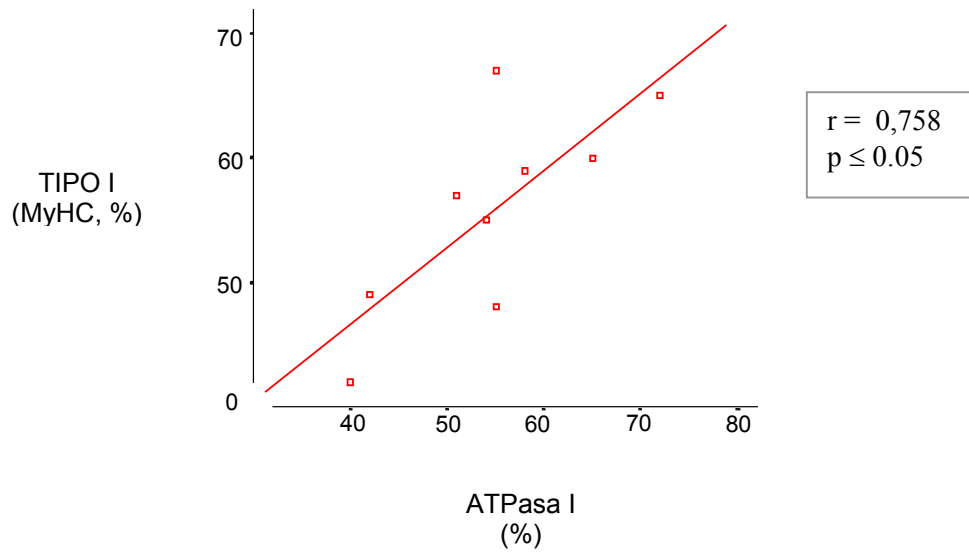
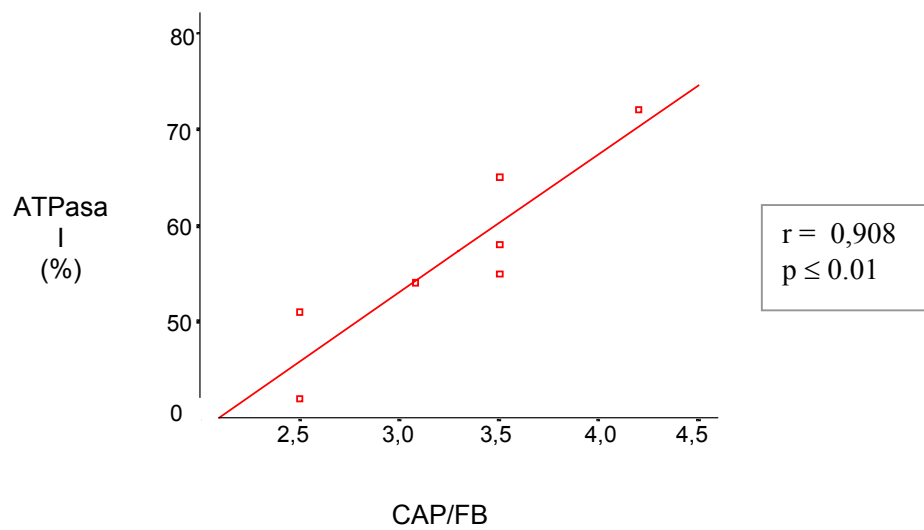
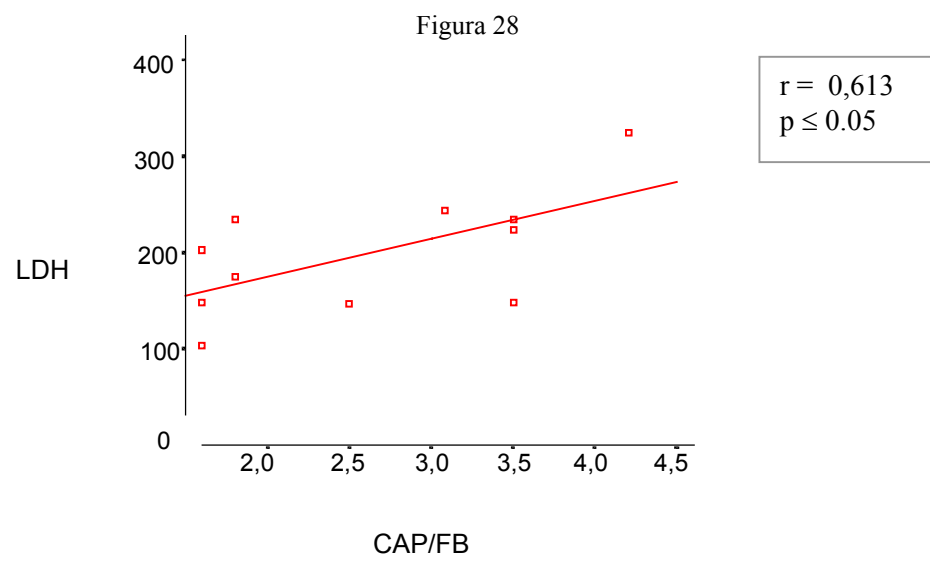
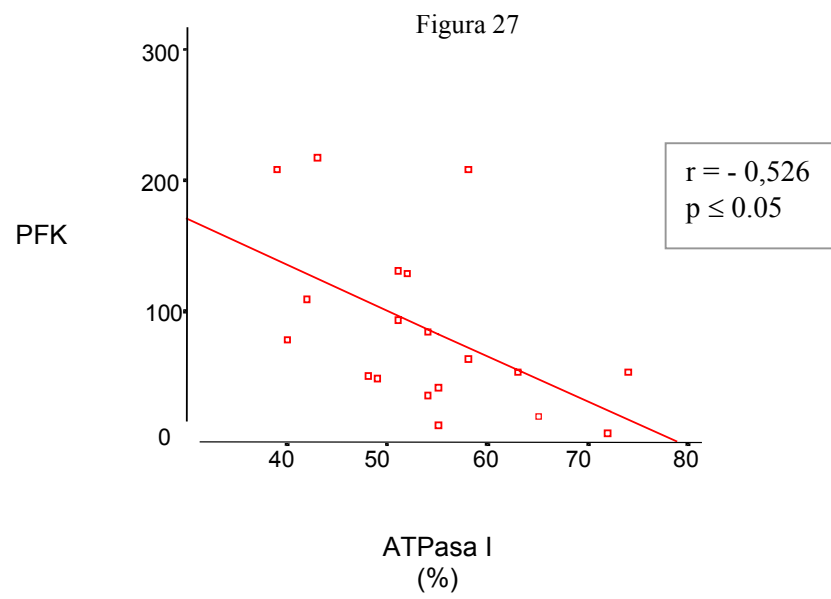


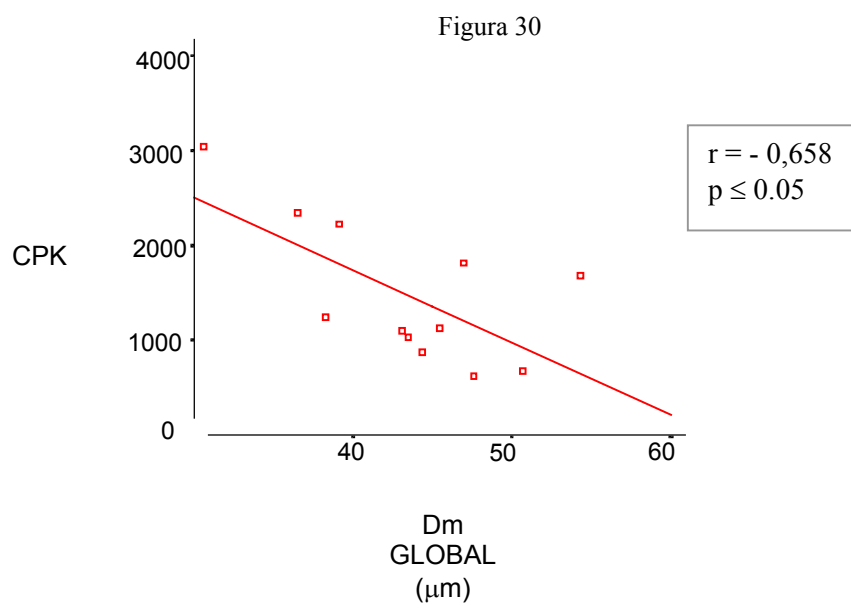
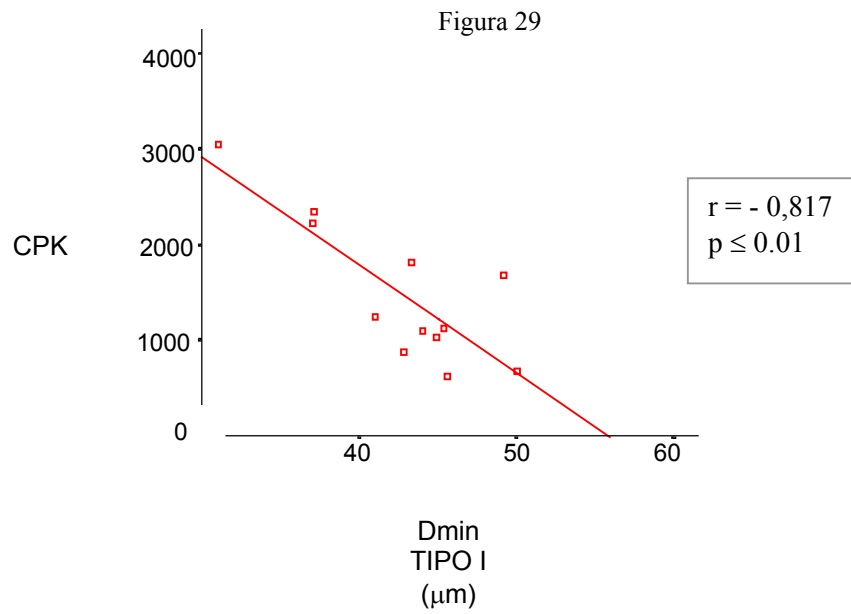
Figura 26



*Estructura fibrilar con metabolismo (actividad glicolítica) (Población total)*

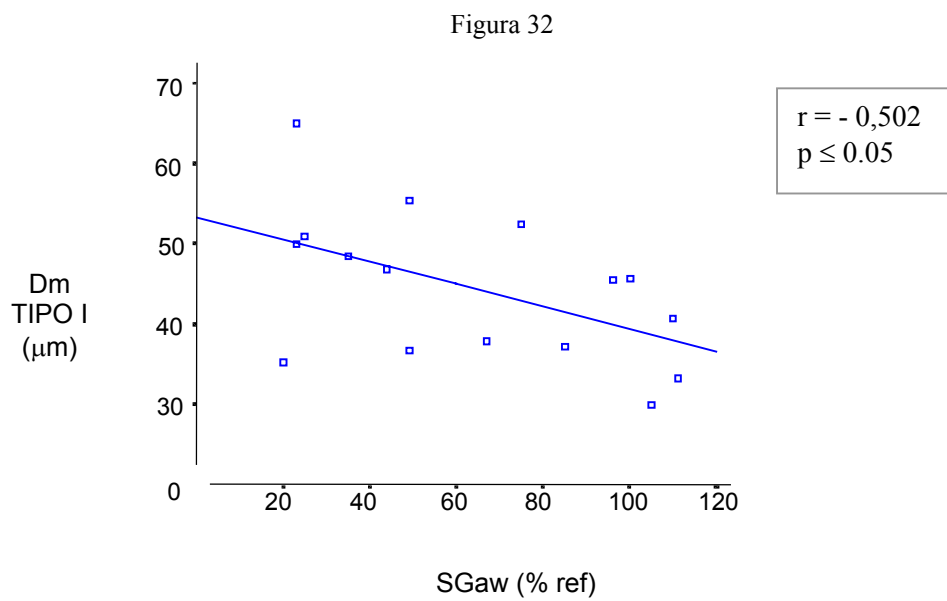
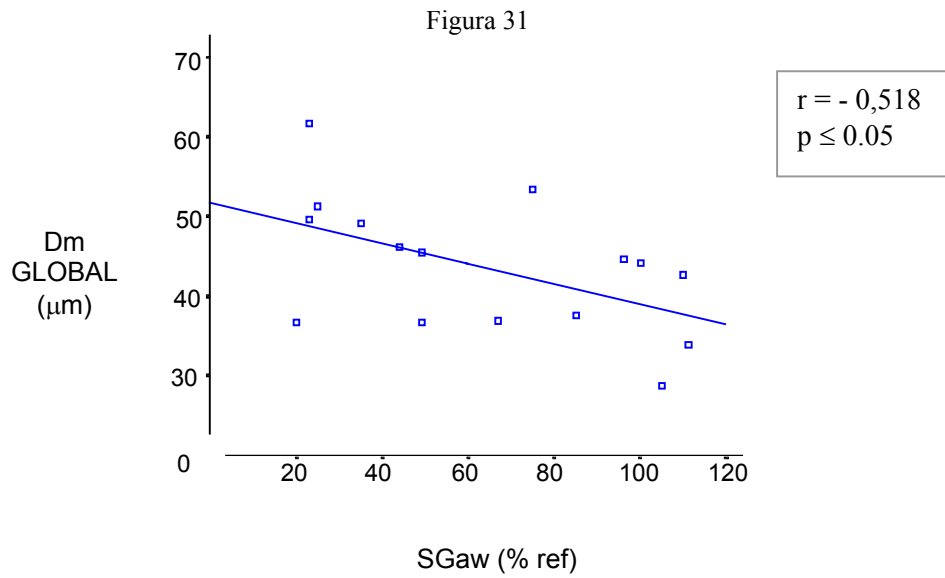


*Estructura fibrilar con metabolismo (almacenamiento energético) (Población total)*



**INTERCOSTAL EXTERNO**

Estructura fibrilar con función pulmonar (población total)



Actividad enzimática con función pulmonar (*población total*)

Figura 33

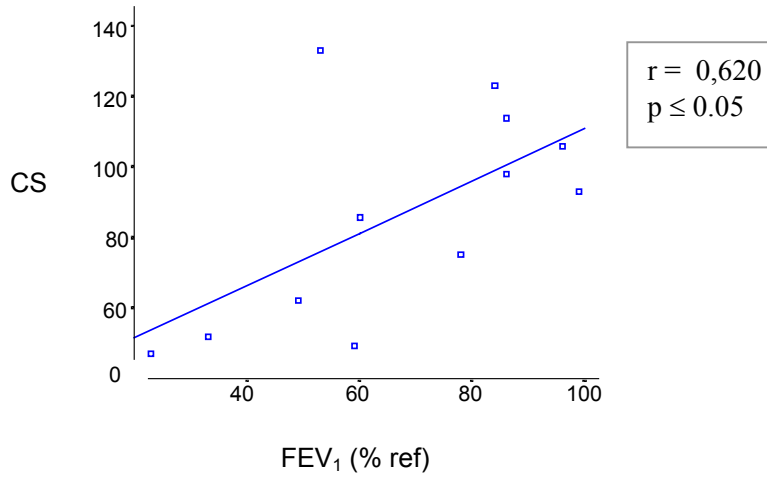
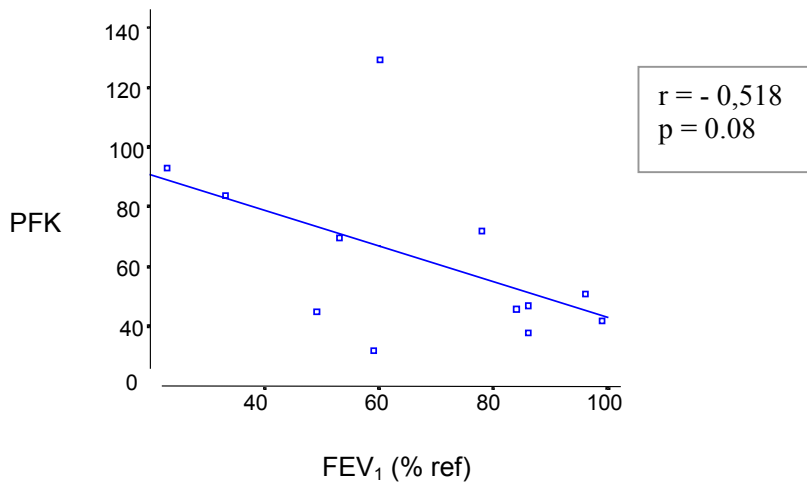


Figura 34



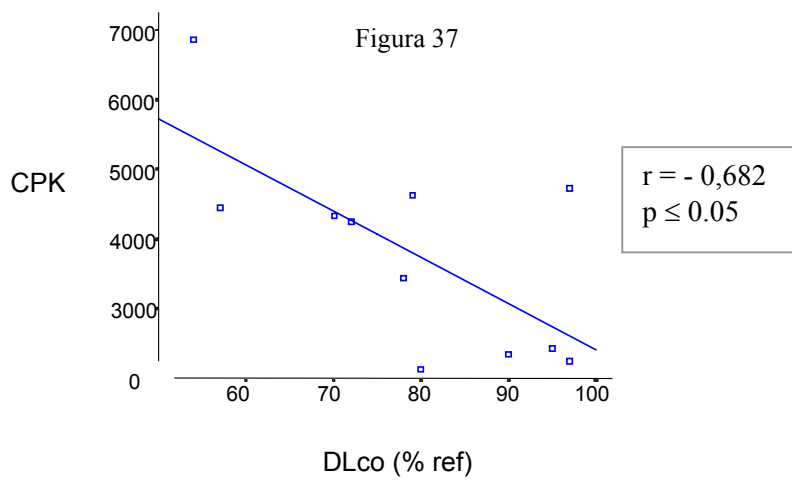
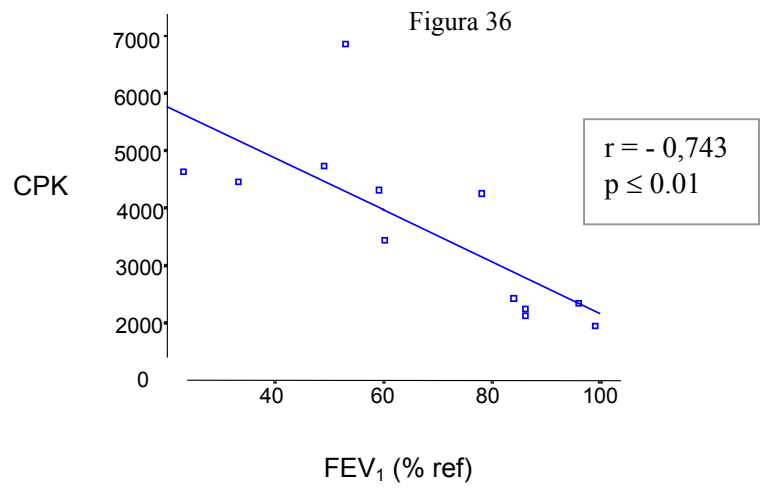
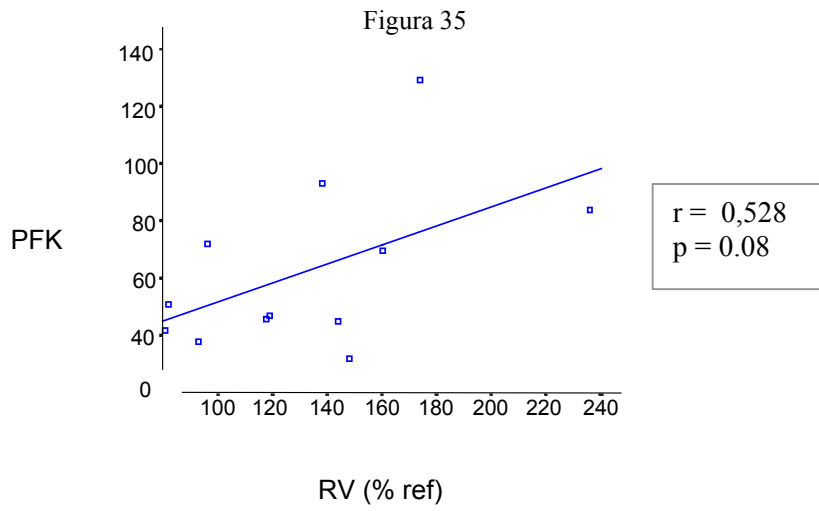




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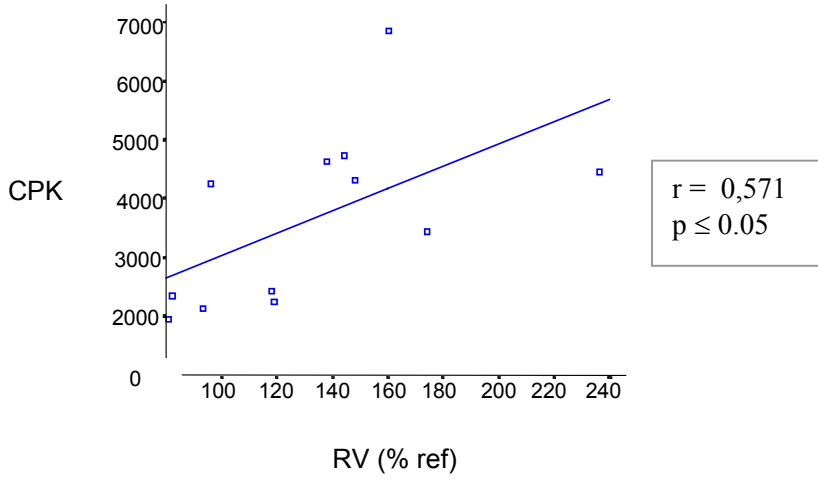


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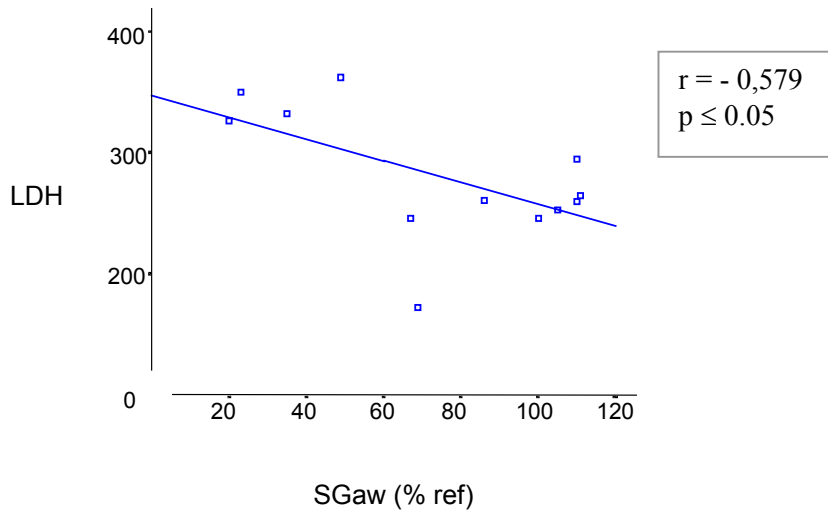


Figura 40

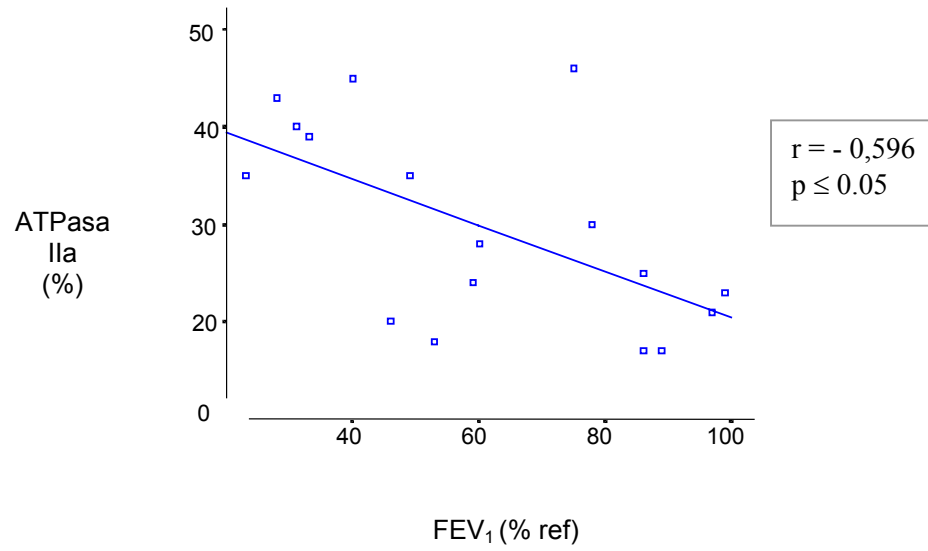
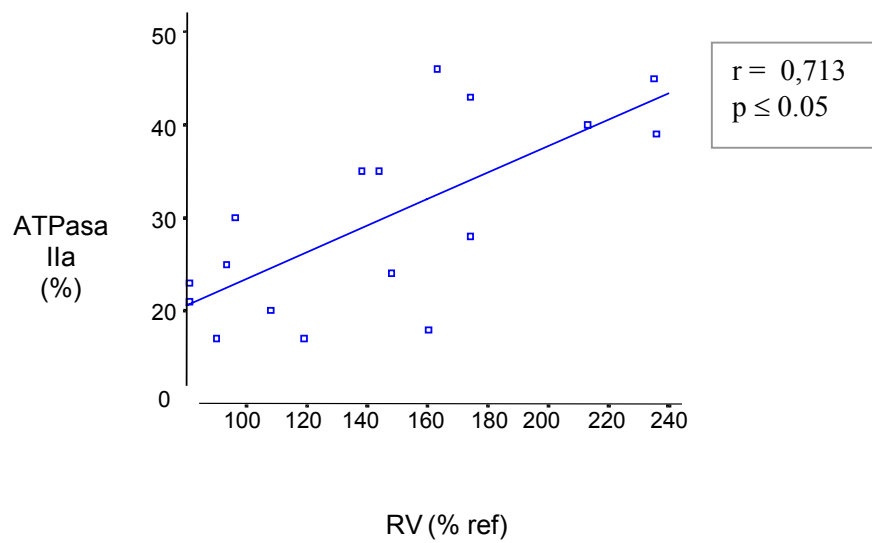


Figura 41



Actividad enzimática con función pulmonar (exclusivamente pacientes con EPOC)

Figura 42

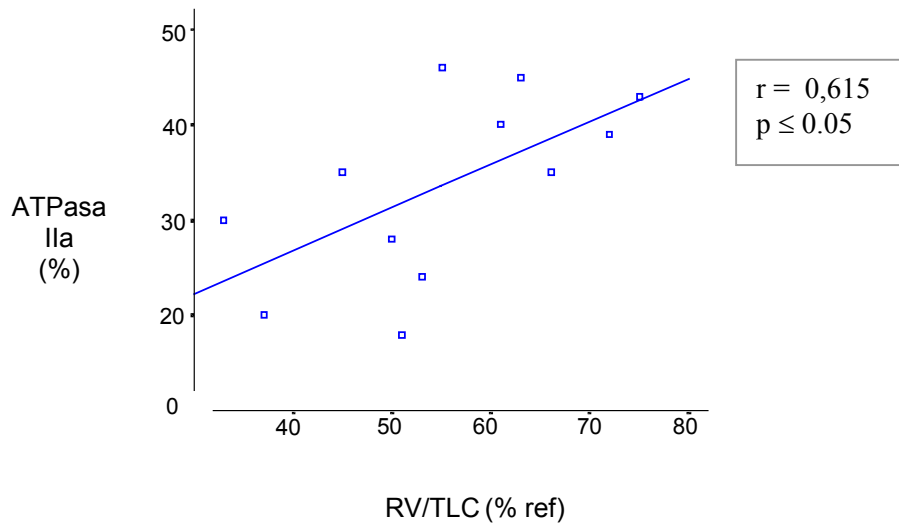
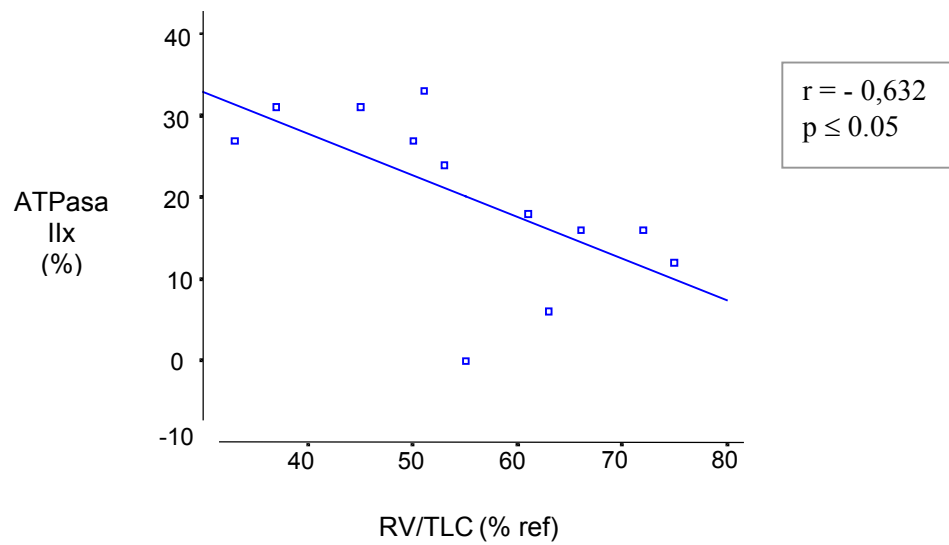
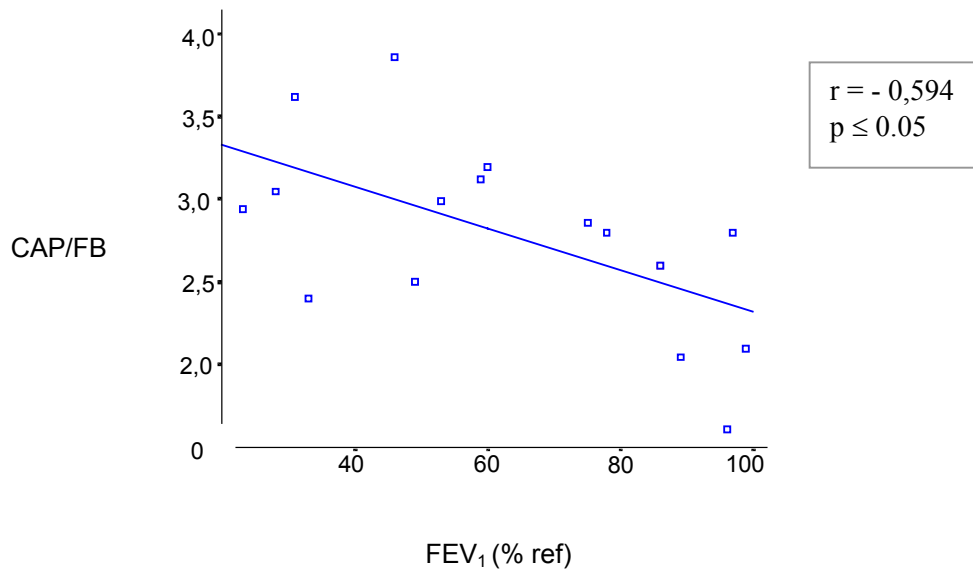


Figura 43



*Densidad capilar con función pulmonar (población total)*

Figura 44



Función muscular y capacidad de ejercicio con actividad enzimática (Población total)

Figura 45

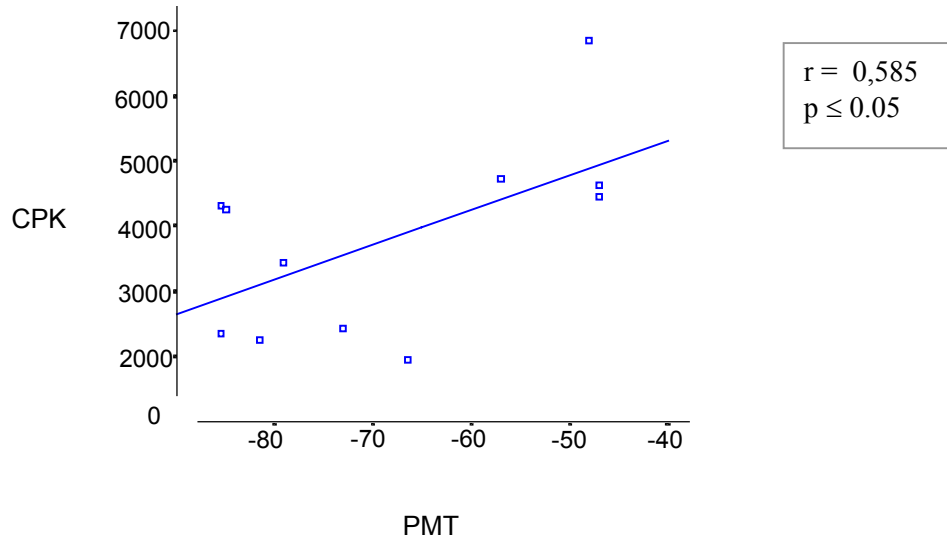
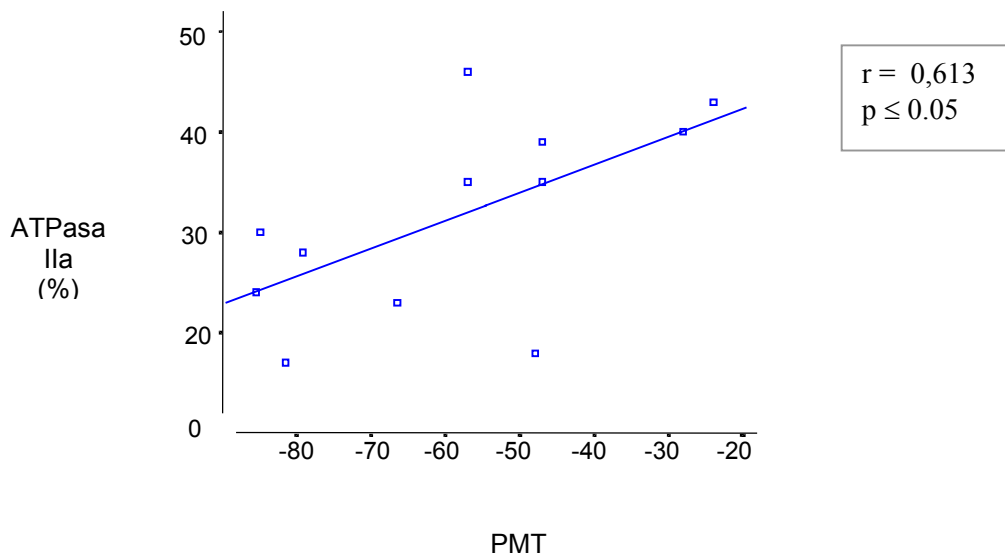


Figura 46



*Función muscular y capacidad de ejercicio con actividad enzimática  
(exclusivamente pacientes con EPOC)*

Figura 47

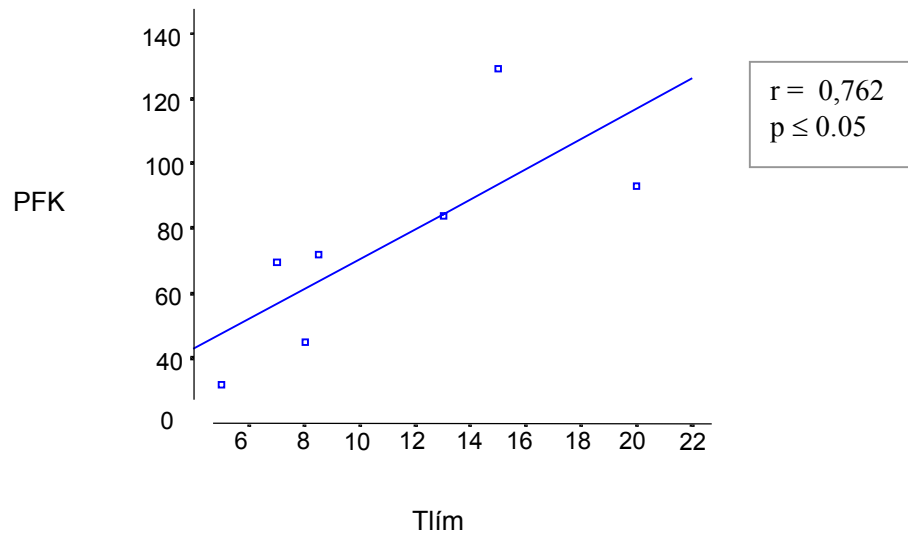
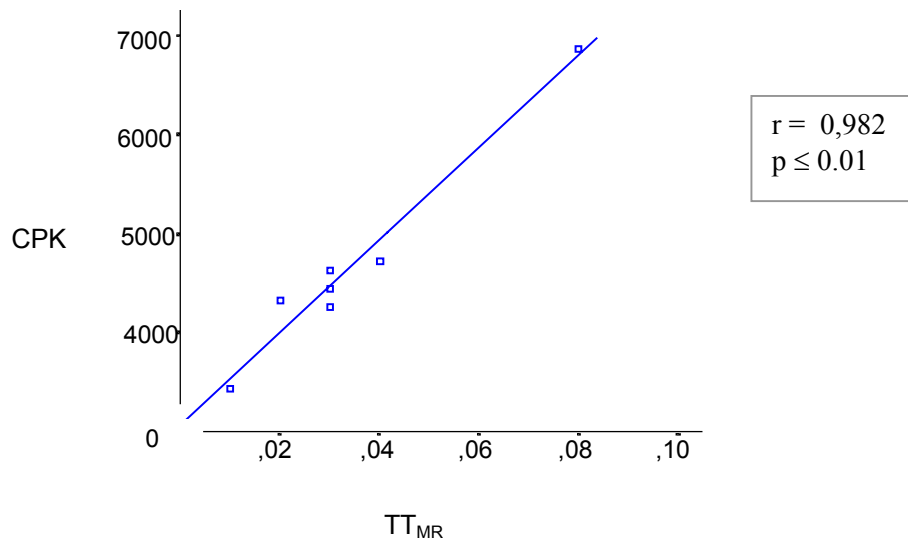
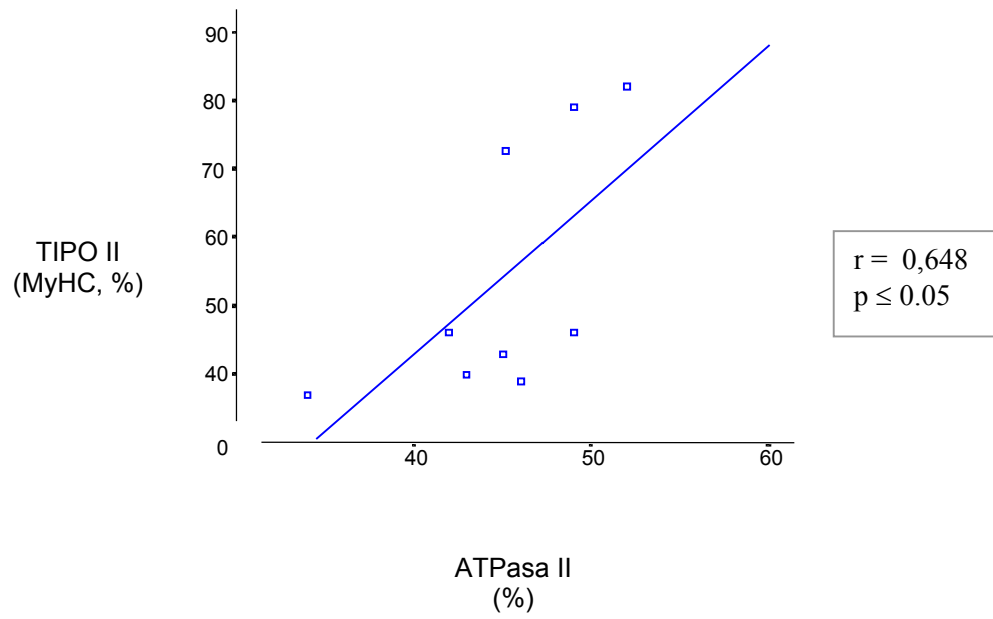


Figura 48

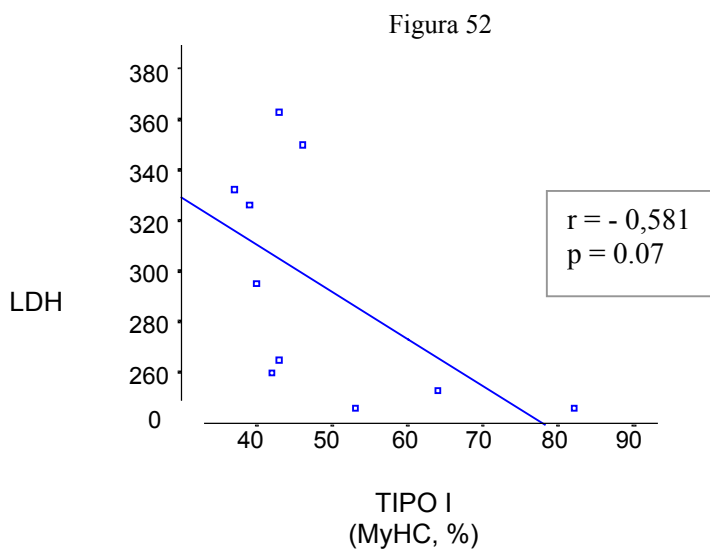
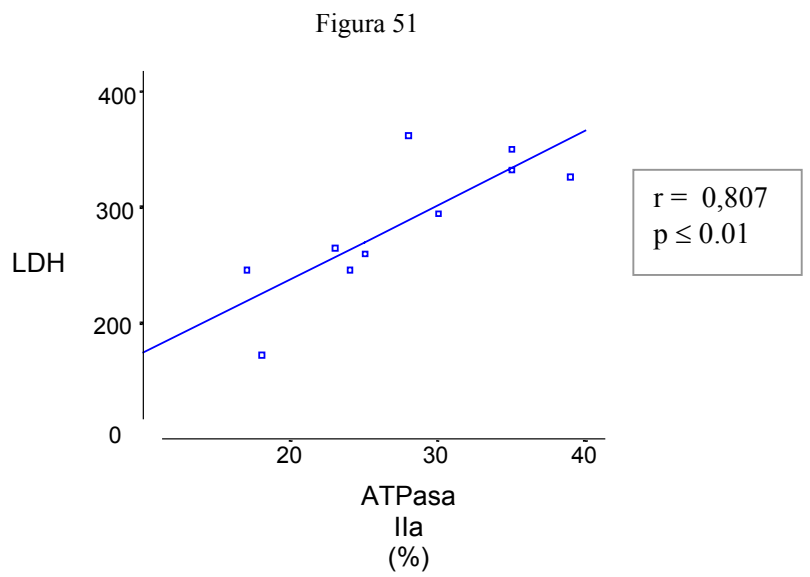
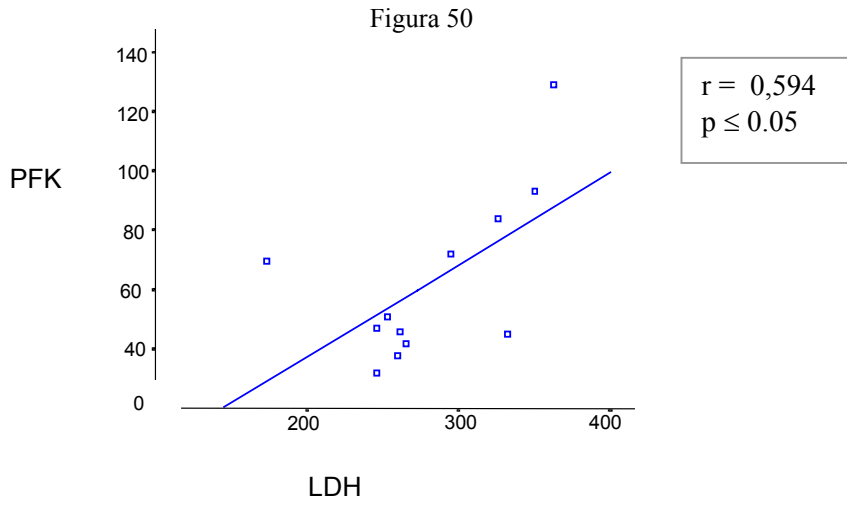


Estructura fibrilar con metabolismo (actividad oxidativa) (exclusivamente pacientes con EPOC)

Figura 49

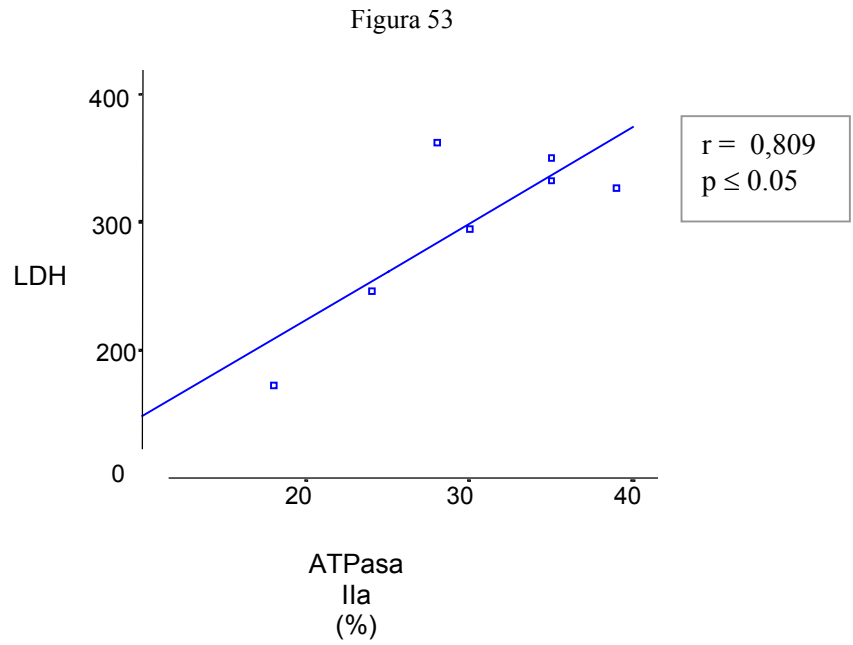


Estructura fibrilar con metabolismo (actividad glicolítica) (Población total)

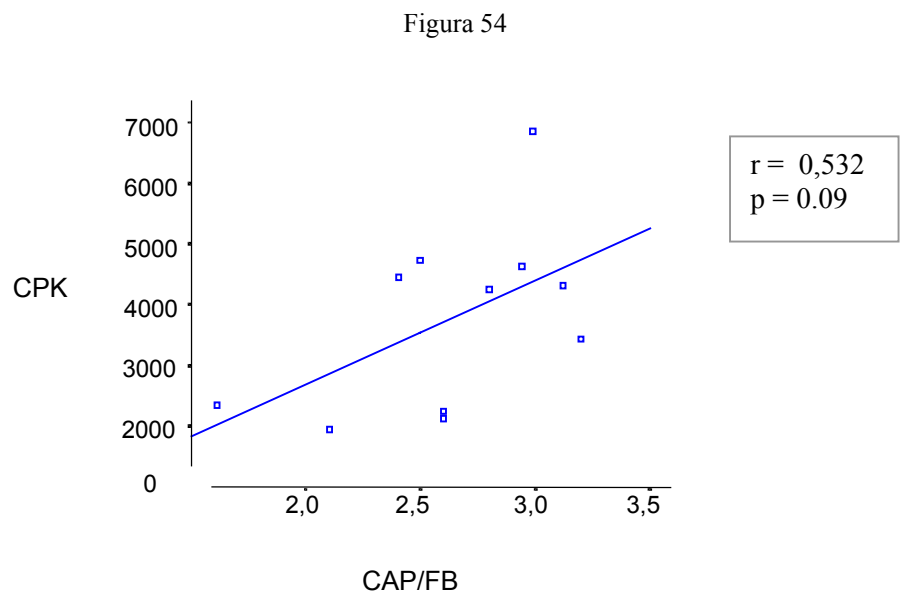




Estructura fibrilar con metabolismo (actividad glicolítica) (exclusivamente pacientes con EPOC)

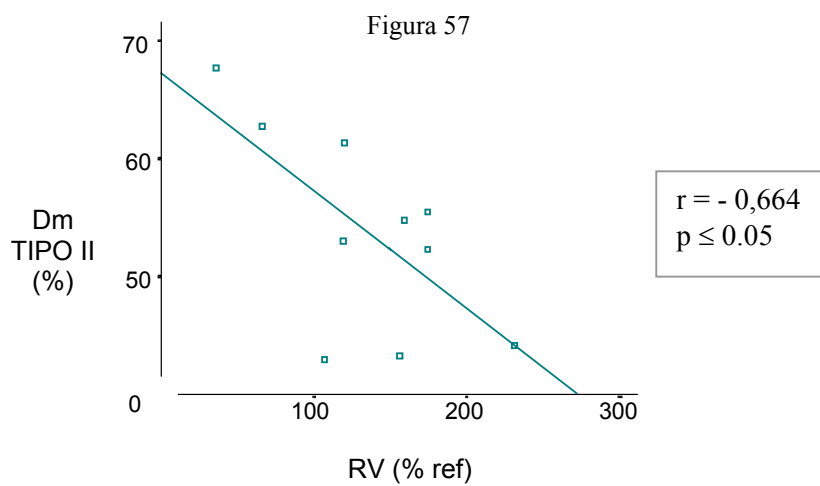
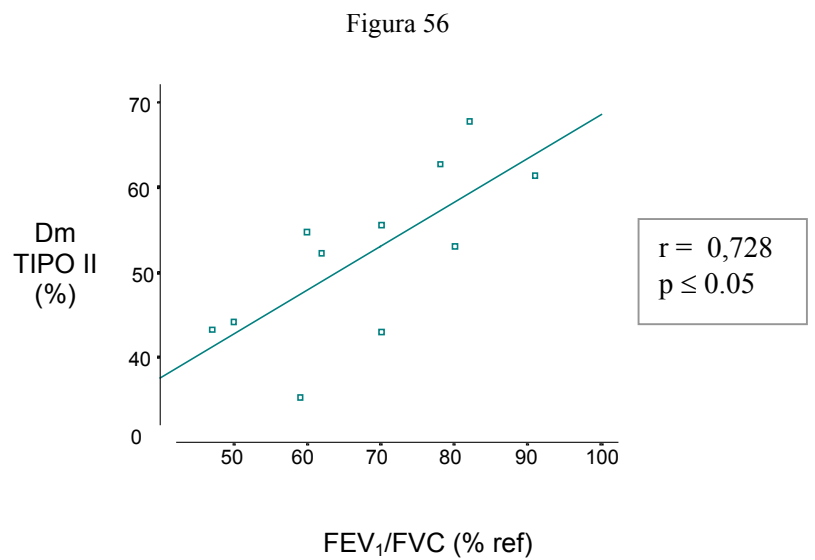
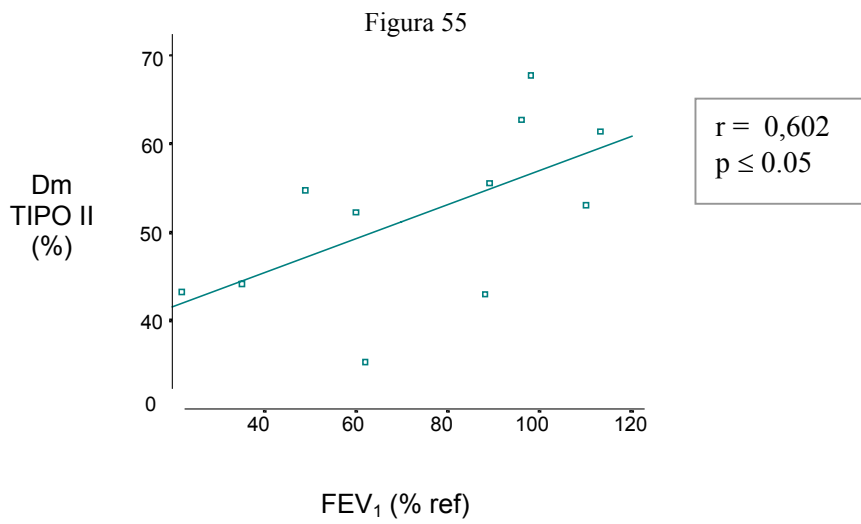


Estructura fibrilar con metabolismo (almacenamiento energético) (Población total)



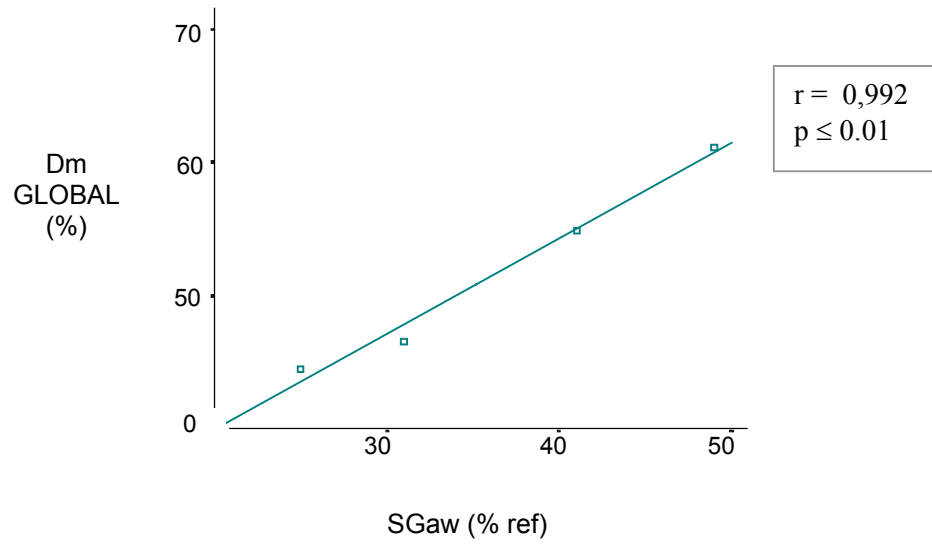
**DELTOIDES**

*Estructura fibrilar con función pulmonar (población total)*



*Estructura fibrilar con función pulmonar (exclusivamente pacientes con EPOC)*

Figura 58



*Actividad enzimática con función pulmonar (Población total)*

Figura 59

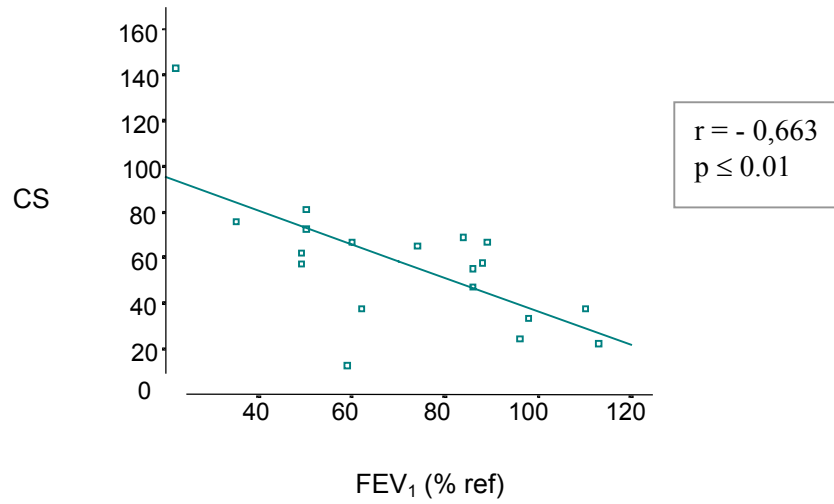
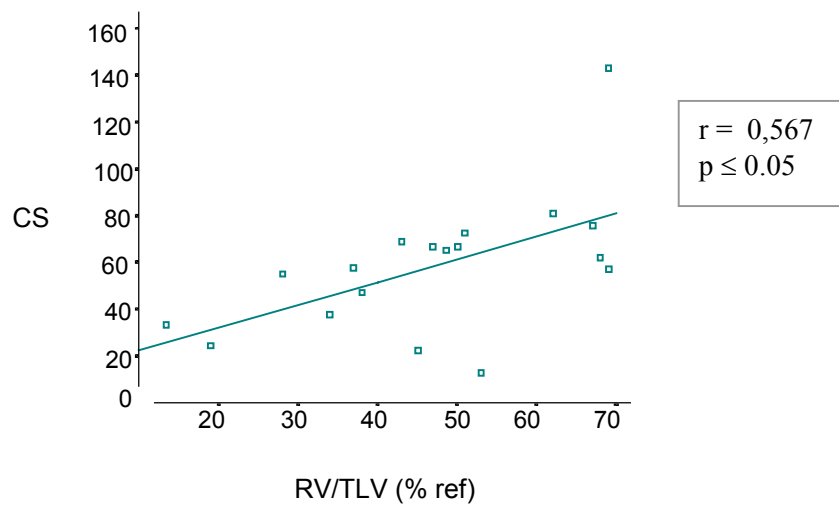
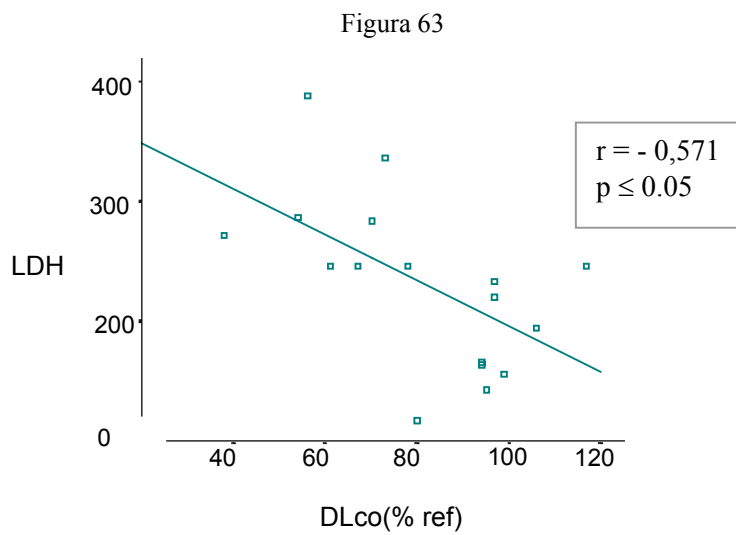
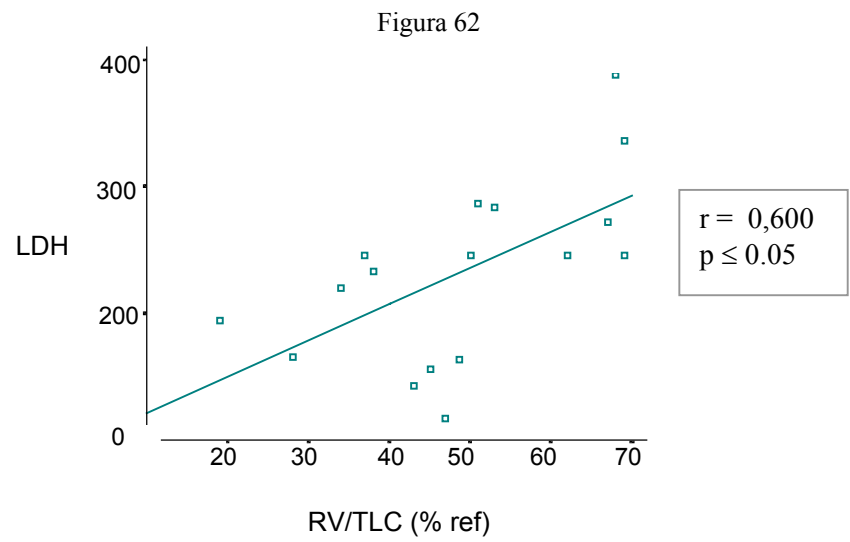
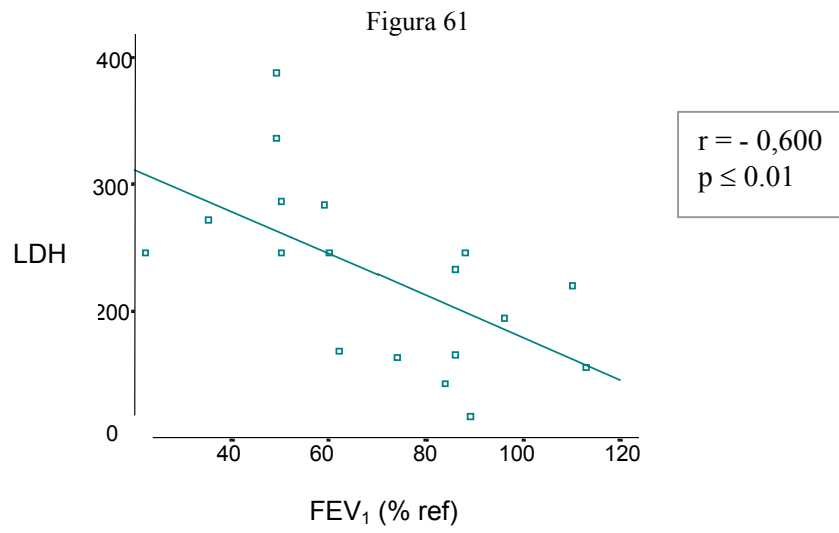


Figura 60





*Actividad enzimática con función pulmonar (exclusivamente pacientes con EPOC)*

Figura 64

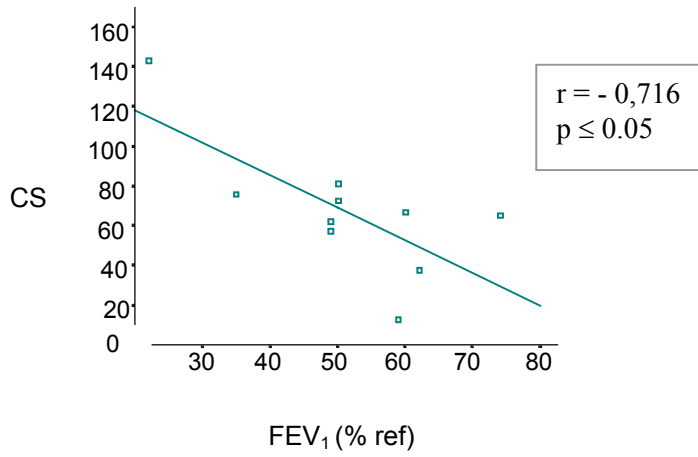


Figura 65

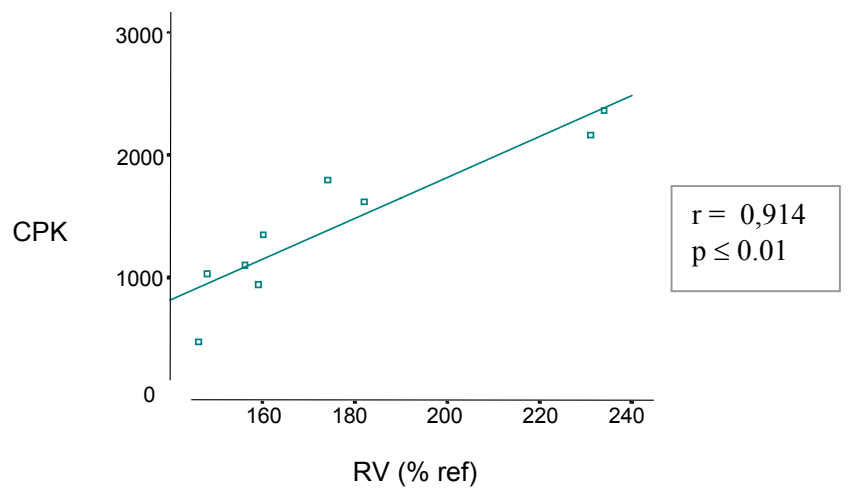
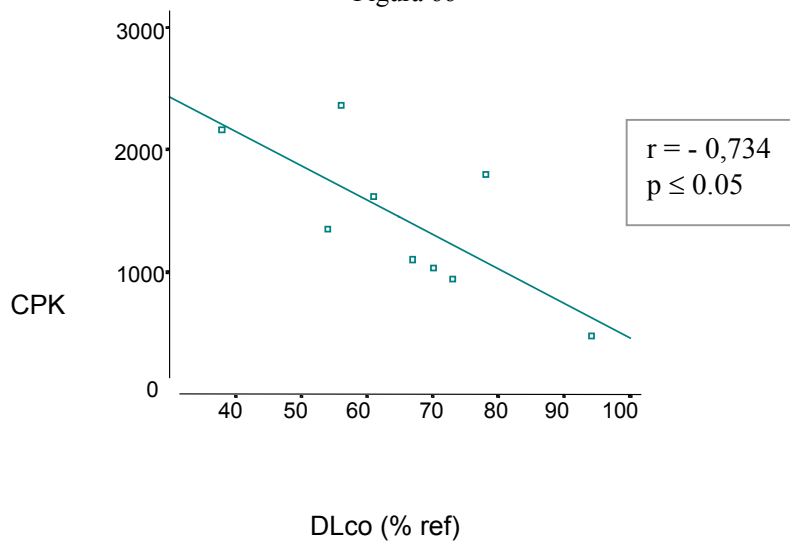
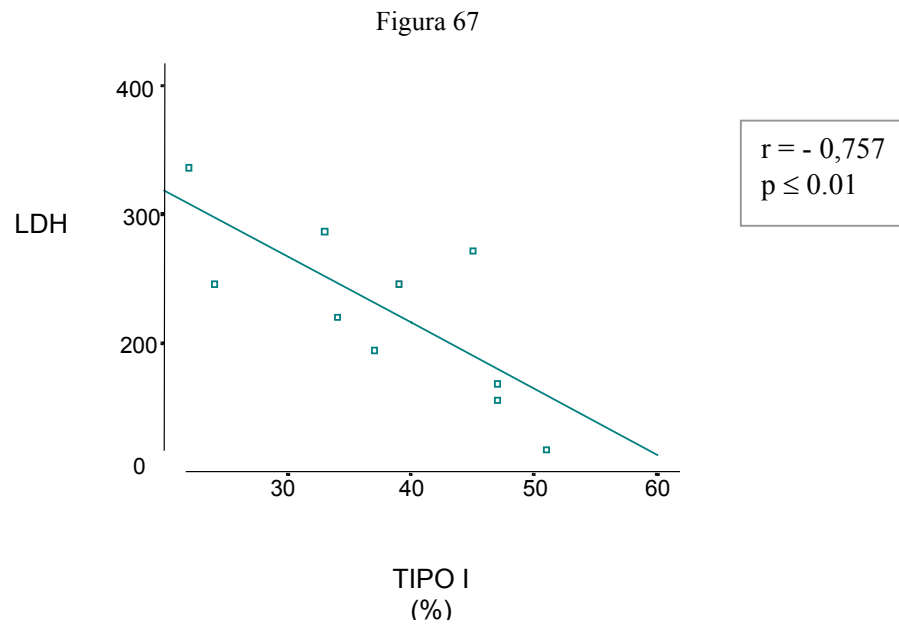


Figura 66



*Estructura fibrilar con metabolismo (actividad oxidativa) (Población total)*



*Estructura fibrilar con metabolismo (actividad oxidativa) (exclusivamente pacientes con EPOC)*

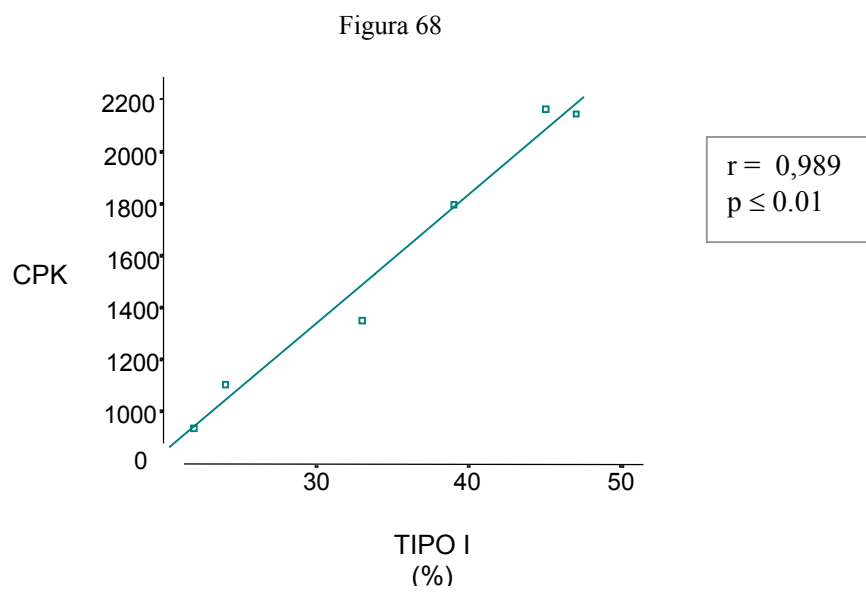


TABLA 1. Datos generales, antropométricos y nutricionales

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Paciente	Edad (años)	Peso (Kg)	Talla (cm)	BMI (Kg/m <sup>2</sup> )	Hb (g/dl)	Proteínas (g/dl)	Albúmina (g/dl)	Alb/Glob	Colesterol (g/dl)	TP (%)
1	70	79	166	28,67	15,9	7,5	4,5	1,5	194	94
2	34	63	170	21,80	10,5	5,4	3,6	2,0	128	100
3	66	70	166	25,40	13,4	7,0	4,3	1,6	234	99
4	45	74	171	25,31	14,8	7,4	4,3	1,4	183	87
5	52	87	178	27,46	14,7	7,0	4,8	2,2	248	88
6	39	110	186	31,80	12,5	6,8	4,1	1,5	137	94
7	64	63	168	22,32	12,4	6,9	3,8	1,2	192	79
8	69	71	182	21,43	12,4	6,6	3,9	1,4	150	82
9	59	67	167	24,02	13,9	6,1	3,5	1,4	116	83
10	67	77	165	28,28	12,9	6,6	4,1	1,6	202	93
11	34	63	170	21,80	14,7	6,4	4,0	1,7	184	91
12	58	61	164	22,68	13,4	6,5	3,8	1,4	232	115
13	61	70	163	26,35	12,1	6,1	3,7	1,5	136	87
14	71	85	172	28,73	13,7	7,1	4,4	1,6	189	93

X	56	74	171	25,43	13,4	6,7	4,1	1,6	180	92
±SD	13	13	7	3,2	1,4	0,6	0,4	0,3	42	9

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15	55	80	173	26,73	15,8	7,1	4,5	1,7	276	100
16	62	80	173	26,70	12,7	7,0	3,8	1,2	199	94
17	52	43	161	16,59	16,2	7,8	4,7	1,5	200	91
18	57	66	169	23,11	13,0	5,6	3,9	1,5	151	94
19	40	50	177	15,96	12,2	6,2	3,9	1,7	131	81
20	53	75	163	28,23	15,1	6,9	3,9	1,3	236	111
21	74	77	179	24,03	12,8	6,8	4,0	1,5	180	101
22	63	44	167	15,78	14,5	6,8	4,3	1,7	199	113
23	67	60	165	22,04	14,1	6,1	3,5	1,3	200	98
24	78	63	171	21,55	15,2	6,8	3,8	1,3	129	82
25	69	68	170	23,53	13,1	6,0	3,5	1,3	142	87
26	58	74	176	23,89	14,8	7,1	4,3	1,5	262	97
27	47	77	170	26,64	13,7	6,6	4,4	2,0	202	92
28	59	81	167	29,04	14,0	6,1	4,1	2,1	179	97
29	58	47	165	17,26	14,8	6,1	3,5	1,9	170	108
30	62	76	161	29,32	16,0	7,0	4,5	1,8	194	98
31	47	63	166	22,86	15,6	6,5	4,2	1,8	247	114
32	70	61	168	21,61	14,1	6,4	4,1	1,8	179	96
33	71	62	158	24,84	15,1	6,9	4,5	1,9	238	107
34	71	88	171	30,09	14,9	6,6	4,2	1,8	225	103

X	61	67	169	23,49	14,4	6,6	4,1	1,6	197	98
±SD	10	13	6	4,5	1,2	0,5	0,4	0,3	42	9

GLOBAL X	59	70	169	24,29	14,0	6,6	4,1	1,6	190	96
±SD	11	14	6	4,1	1,3	0,5	0,4	0,3	42	10

Abreviaturas: **BMI**: índice de masa corporal; **alb/glob**: cociente albúmina-globulina; **Hb**: hemoglobina; **TP**: tasa de protombina. **ND**: no disponible.



TABLA 2. Valores de función pulmonar

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Paciente	FEV <sub>1</sub> (%ref)	FVC (%ref)	FEV <sub>1</sub> /FVC (%)	TLC (%ref)	RV (%ref)	RV/TLC (%)	Sgaw (%ref)	DL <sub>CO</sub> (%ref)	K <sub>CO</sub> (%ref)	PaO <sub>2</sub> (mm Hg)	PaCO <sub>2</sub> (mm Hg)
1	113	94	91	114	120	45	125	99	91	86	35,8
2	110	97	80	115	119	34	134	97	93	89	38,4
3	99	97	75	101	81	29	111	ND	ND	82	43,1
4	98	91	82	81	36	14	129	136	116	107	38,4
5	97	92	79	93	81	80	96	97	88	102	43,0
6	96	95	78	91	66	19	131	106	88	92	36,4
7	96	98	70	95	82	29	105	90	81	88	38,7
8	89	91	70	133	174	47	119	80	98	87	32,4
9	89	92	71	98	90	33	85	80	81	88	44,0
10	88	93	70	114	107	37	82	117	86	85	30,9
11	86	80	80	85	88	28	120	94	108	104	39,8
12	86	92	70	111	119	38	100	97	86	85	33,1
13	86	84	74	87	93	41	110	80	81	83	36,5
14	84	86	70	113	119	43	86	95	81	85	40,1

X	94	92	76	102	98	37	110	98	91	90	37,9
±SD	9	5	6	15	32	16	18	16	11	8	4,0

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15	78	84	69	96	96	33	110	72	72	100	35,9
16	75	75	69	106	163	55	75	89	72	94	33,1
17	74	92	71	105	146	49	53	94	90	89	35,1
18	74	77	72	107	149	48	65	83	129	92	36,1
19	62	81	59	ND	ND	ND	ND	ND	ND	107	37,9
20	60	73	62	118	174	50	49	78	77	83	39,3
21	59	70	59	106	148	53	67	70	85	76	39,8
22	50	80	49	115	160	51	69	54	58	92	35,7
23	50	66	55	115	182	62	42	61	72	84	35,3
24	49	65	53	151	234	68	34	56	58	91	32,9
25	49	58	60	90	159	69	41	73	95	77	35,3
26	49	73	52	106	144	45	35	97	101	75	37,4
27	46	65	54	93	108	37	44	94	102	88	44,8
28	40	60	49	127	235	63	25	102	99	68	43,3
29	35	53	50	125	231	67	31	38	51	65	42,4
30	33	52	47	127	236	72	20	57	63	67	38,4
31	31	48	49	111	213	61	23	48	65	73	36,0
32	28	38	52	92	174	75	49	73	83	74	46,3
33	23	40	41	94	138	66	23	79	100	76	38,4
34	22	33	47	94	156	69	25	67	79	79	39,4

X	49	64	56	109	171	58	46	73	82	83	38,1
±SD	18	16	9	16	42	12	23	18	20	11	3,7

GLOBAL X	68	75	64	106	140	49	73	83	85	86	38,0
±SD	27	19	13	15	52	17	38	21	17	11	3,8

Abreviaturas: FEV<sub>1</sub>: volumen espiratorio forzado en el primer segundo; FVC: capacidad vital forzada; FEV<sub>1</sub>/FVC: cociente espirométrico porcentual; RV: volumen residual; TLC: capacidad pulmonar total; SGaw: conductancia específica de la vía aérea; DL<sub>CO</sub>: difusión pulmonar del monóxido de carbono; K<sub>CO</sub>: difusión del monóxido de carbono corregida por el volumen alveolar; PaO<sub>2</sub>: presión parcial de oxígeno en sangre arterial; PaCO<sub>2</sub>: presión parcial de dióxido de carbono en sangre arterial.

TABLA 3. Función de los músculos periféricos

Paciente	Fuerza mano dominante (dinas)	Fuerza mano no dominante (dinas)	Fuerza mano no dominante (%ref)
1	48	42	141
2	ND	ND	ND
3	ND	ND	ND
4	55	42	110
5	45	39	75
6	40	30	73
7	ND	ND	ND
8	25	21	60
9	ND	ND	ND
10	35	33	85
11	38	45	69
12	35	33	76
13	ND	ND	ND
14	38	32	112
X	40	35	89
±SD	9	8	26
15	42	32	69
16	ND	ND	ND
17	29	25	56
18	46	33	82
19	43	39	81
20	32	30	61
21	33	30	97
22	21	17	51
23	36	32	87
24	22	15	73
25	36	35	87
26	32	32	69
27	ND	ND	ND
28	30	27	58
29	30	27	65
30	39	27	66
31	40	19	38
32	32	23	68
33	30	20	81
34	38	33	112
X	34	28	72
±SD	7	7	18
GLOBAL X	36	30	78
±SD	8	8	22

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TABLA 4. Presiones respiratorias a volumen corriente y en reposo

CONTROLES

Paciente	$\overline{\text{PI,es}}$ (cm H <sub>2</sub> O)	$\overline{\text{PI,gas}}$ (cm H <sub>2</sub> O)	$\overline{\text{PI,di}}$ (cm H <sub>2</sub> O)	$\text{PI,es}_{\text{peak}}$ (cm H <sub>2</sub> O)	$\text{PI,gas}_{\text{peak}}$ (cm H <sub>2</sub> O)	$\text{PI,di}_{\text{peak}}$ (cm H <sub>2</sub> O)
1	-1,2	2,5	3,7	-4,6	2,8	7,3
2	-6,9	4,9	11,7	-7,6	6,4	14,0
3	-8,6	3,0	11,6	-8,6	4,5	13,1
4	-5,2	1,3	6,5	-6,6	2,4	9,0
5	-3,6	3,1	6,7	-8,0	6,9	14,9
6	-5,9	9,2	15,1	-6,7	9,6	16,3
7	-6,3	2,2	8,5	-4,3	5,7	10,0
8	-2,4	4,6	7,0	-2,7	5,3	8,0
9	-5,0	5,3	10,3	-5,2	4,0	9,2
10	-4,2	ND	ND	-6,1	ND	ND
11	-8,0	ND	ND	-10,0	ND	ND
12	-3,0	6,5	9,5	-5,0	8,0	13,0
13	-4,6	6,2	10,8	-5,2	9,3	14,5
14	-6,9	1,9	8,9	-10,6	2,8	13,5

X	-5,1	4,2	9,2	-6,5	5,6	11,9
±SD	2,1	2,3	3,0	2,2	2,5	3,0

EPOC

15	-5,0	10,0	15,0	-9,0	11,0	28,0
16	-4,7	6,2	10,9	-3,8	4,2	8,0
17	-5,8	3,8	9,5	-8,3	4,0	12,4
18	-5,1	5,4	10,6	-6,8	7,2	13,9
19	-3,8	3,7	7,4	-4,9	4,0	8,9
20	-2,3	4,4	6,7	-2,5	5,9	8,4
21	-4,1	9,4	13,5	-5,4	9,6	15,0
22	-9,2	1,8	11,0	-11,9	2,4	14,3
23	-1,8	ND	ND	-4,3	ND	ND
24	-10,5	4,3	14,8	-10,5	5,8	16,3
25	-2,6	2,0	4,6	-8,4	6,5	14,9
26	-9,0	4,0	13,0	-10,0	5,0	15,0
27	-4,2	1,2	5,4	-6,8	3,4	10,2
28	-8,0	4,0	12,0	-10,0	7,0	17,0
29	ND	ND	ND	ND	ND	ND
30	-7,0	12,0	19,0	-8,0	12,0	20,0
31	-13,0	6,0	19,0	-15,0	8,0	23,0
32	ND	ND	ND	ND	ND	ND
33	-10,0	9,0	19,0	-12,0	14,0	26,0
34	-6,9	1,0	7,9	-11,7	5,1	16,8

X	-6,3	5,2	11,7	-8,3	6,8	15,8
±SD	3,1	3,2	4,6	3,3	3,2	5,8

GLOBAL X	-5,8	4,8	10,7	-7,5	6,3	14,2
±SD	2,8	2,9	4,2	3,0	3,0	5,2

Abreviaturas:  $\overline{\text{PI,es}}$ : presión esofágica media;  $\overline{\text{PI,gas}}$ : presión gástrica media;  $\overline{\text{PI,di}}$ : presión transdiafragmática media;  $\text{PI,es}_{\text{peak}}$ : presión esofágica en pico;  $\text{PI,gas}_{\text{peak}}$ : presión gástrica en pico;  $\text{PI,di}_{\text{peak}}$ : presión transdiafragmática en pico.

TABLA 5. Fuerza máxima de los músculos respiratorios

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Paciente	PI,m <sub>máx</sub> (cm H <sub>2</sub> O)	spPI,m <sub>máx</sub> (%ref) (Morales)	PI,m <sub>máx</sub> (%ref) (Wilson)	PI,es <sub>máx</sub> (cm H <sub>2</sub> O)	PI,gas <sub>máx</sub> (cm H <sub>2</sub> O)	PI,di <sub>máx</sub> (cm H <sub>2</sub> O)
1	ND	ND	ND	-107,0	34,0	141,0
2	-108	80	99	-86,2	32,4	118,4
3	-82	77	107	-71,6	36,3	107,9
4	-96	74	100	-87,4	25,4	112,8
5	-150	115	169	-139,0	11,0	150,0
6	-116	74	113	-68,1	19,3	87,3
7	-97	93	128	-76,6	-9,9	66,7
8	-71	68	100	-50,0	7,5	57,5
9	-77	69	95	-45,8	29,4	75,2
10	-85	78	116	-64,7	ND	ND
11	-85	63	79	-85,0	ND	ND
12	-97	89	118	-55,0	67,0	123,0
13	-81	73	102	-95,0	37,0	132,0
14	-90	82	130	-99,0	6,0	105,0

X	-95	79	112	-80,7	24,6	106,4
±SD	21	13	22	24,9	19,8	29,4

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15	-152	123	178	-69,0	47,0	116,0
16	-87	75	110	-71,9	10,9	82,8
17	-84	80	95	-57,7	6,8	64,5
18	-83	73	100	-90,0	30,0	120,0
19	-90	74	89	-62,0	11,1	73,1
20	-79	64	90	-77,3	7,2	84,5
21	-87	85	131	-103,7	36,6	140,0
22	-48	51	62	-45,6	8,2	53,8
23	-50	50	68	-57,0	ND	ND
24	-40	45	64	-74,2	19,3	93,6
25	-62	61	87	-82,0	29,0	111,0
26	-96	82	117	-74,0	20,0	94,0
27	-96	74	100	-99,9	72,6	172,5
28	-66	55	77	-59,0	12,0	71,0
29	-21	21	25	ND	ND	ND
30	-61	54	78	-76,0	32,0	108,0
31	-64	53	67	-56,0	44,0	100,0
32	-76	78	73	ND	ND	ND
33	-55	57	74	-77,0	57,0	134,0
34	-61	55	88	-48,0	34,0	82,0

X	-73	65	89	-71,1	28,1	100,0
±SD	27	21	31	16,3	19,1	30,4

GLOBAL X	-82	71	98	-75,3	26,7	102,7
±SD	40	19	30	20,7	19,1	29,6

Abreviaturas: **PI,m<sub>máx</sub>**: presión inspiratoria máxima; **spPI,m<sub>máx</sub>**: presión inspiratoria máxima con valores de referencia para población mediterránea (Morales 1997<sup>61</sup>); **PI,es<sub>máx</sub>**: presión esofágica máxima; **PI,gas<sub>máx</sub>**: presión gástrica máxima; **PI,di<sub>máx</sub>**: presión transdiafragmática máxima.

TABLA 6. Reserva funcional de los músculos respiratorios

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Paciente	$\overline{PI,di} / PI,di_{m\acute{a}x}$	$\overline{PI,es} / PI,es_{m\acute{a}x}$	TTdi	TTmr
1	0,03	0,01	0,01	0,02
2	0,10	0,08	ND	ND
3	0,11	0,12	0,04	0,04
4	0,06	0,06	0,03	0,03
5	0,04	0,03	ND	ND
6	0,17	0,09	0,09	0,05
7	0,13	0,08	0,03	0,03
8	0,12	0,05	ND	ND
9	0,14	0,11	0,05	0,05
10	ND	0,06	ND	0,03
11	ND	0,09	ND	0,04
12	0,08	0,05	0,03	0,02
13	0,08	0,05	ND	ND
14	0,08	0,07	0,04	0,03

X	0,10	0,07	0,04	0,03
$\pm$ SD	0,04	0,03	0,02	0,01

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15	0,13	0,07	0,02	0,02
16	0,13	0,07	0,05	0,02
17	0,15	0,09	0,07	0,04
18	0,09	0,06	0,02	0,01
19	0,10	0,06	0,05	0,03
20	0,08	0,03	0,03	0,01
21	0,10	0,04	0,05	0,02
22	0,20	0,20	0,08	0,08
23	ND	0,03	ND	0,01
24	0,16	0,14	0,07	0,06
25	0,04	0,03	0,01	0,01
26	0,14	0,12	0,04	0,04
27	0,03	0,04	0,02	0,02
28	0,17	0,14	0,04	0,04
29	ND	ND	ND	ND
30	0,18	0,09	0,03	0,03
31	0,19	0,23	0,06	0,06
32	ND	ND	ND	ND
33	0,14	0,13	0,03	0,03
34	0,10	0,14	0,04	0,06

X	0,13	0,10	0,04	0,03
$\pm$ SD	0,05	0,06	0,02	0,02

GLOBAL X	0,11	0,08	0,04	0,03
$\pm$ SD	0,05	0,05	0,02	0,02

Abreviaturas: **TTdi**: índice tensión-tiempo del diafragma; **TT<sub>MR</sub>**: índice tensión-tiempo global de los músculos respiratorios.

TABLA 7. Resistencia de los músculos respiratorios

CONTROLES	Paciente	PMT (cm H <sub>2</sub> O)	T <sub>lim</sub> (min)
	1	-80,3	ND
	2	ND	ND
	3	-66,5	20
	4	-96,0	19
	5	ND	ND
	6	-87,1	14
	7	-85,5	12
	8	ND	ND
	9	ND	ND
	10	-76,9	13
	11	-64,8	8
	12	-81,6	11
	13	ND	ND
14	-73,1	13	
X		-79,1	14
±SD		10,0	4
15		-85,0	9
16		-57,0	20
17		-70,0	11
18		ND	ND
19		-80,6	7
20		-79,2	15
21		-85,5	5
22		-48,0	7
23		-39,4	8
24		-21,4	5
25		-42,0	8
26		-57,0	8
27		ND	ND
28		ND	ND
29		-18,0	6
30		-47,0	13
31		-28,0	20
32		-24,0	5
33		-47,0	20
34		-46,2	ND
X		-51,5	10
±SD		22,3	6
GLOBAL	X	-61,0	12
	±SD	23,0	5

Abreviaturas: **PMT**: presión máxima tolerada en la prueba incremental; **T<sub>lim</sub>**: tiempo de resistencia en la prueba submáxima de carga constante.

TABLA 8. a) Patrón ventilatorio en reposo  
b) Parámetros ventilatorios, metabólicos y de carga durante el esfuerzo máximo en la prueba ergométrica incremental

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a)

Paciente	Vt (ml)	RR (min <sup>-1</sup> )	T <sub>I</sub> (seg)	T <sub>I</sub> /T <sub>TOT</sub>
1	736	15	1,7	0,4
2	ND	ND	ND	ND
3	667	24	0,8	0,3
4	540	15	1,8	0,5
5	ND	ND	ND	ND
6	1246	7	4,4	0,5
7	588	18	1,3	0,4
8	ND	ND	ND	ND
9	979	11	2,4	0,4
10	784	11	2,3	0,4
11	727	13	1,8	0,4
12	598	18	1,3	0,4
13	ND	ND	ND	ND
14	683	12	2,4	0,5

X	755	14	2,0	0,4
±SD	212	5	1,0	0,1

15	800	19	0,9	0,3
16	ND	21	1,1	0,4
17	562	17	1,7	0,5
18	ND	ND	ND	ND
19	649	11	2,5	0,5
20	552	17	1,3	0,4
21	681	12	2,5	0,5
22	508	17	1,4	0,4
23	748	15	1,8	0,4
24	634	17	1,6	0,4
25	539	21	1,0	0,4
26	667	16	1,2	0,3
27	542	15	1,5	0,4
28	714	15	0,8	0,3
29	620	25	0,8	0,4
30	400	16	0,9	0,3
31	687	12	1,2	0,3
32	875	19	ND	ND
33	734	12	1,0	0,3
34	661	18	1,3	0,4

X	643	17	1,4	0,4
±SD	114	4	0,5	0,1

GLOBAL X	683	16	1,6	0,4
±SD	162	4	0,8	0,1

b)

Vt (ml)	VO <sub>2</sub> (ml/Kg/min)	VO <sub>2</sub> %ref	RQ	WR (watts)
ND	ND	ND	ND	ND
1663	33,2	75	1,2	225
ND	ND	ND	ND	ND
2311	29,7	84	1,2	150
ND	ND	ND	ND	ND
2742	22,7	73	1,1	175
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
2272	21,6	89	1,0	150
2500	39,8	90	1,2	175
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND

2298	29,4	82	1,1	175
401	8	8	0,1	31

ND	ND	ND	ND	175
1252	ND	ND	ND	ND
1549	33,8	73	1,1	75
2122	20,4	60	1,2	100
1826	23,8	40	1,3	100
1915	23,7	86	1,1	125
ND	ND	ND	ND	ND
1330	22,6	49	1,1	75
1541	23,0	74	1,2	100
1199	10,2	34	0,9	25
1305	20,7	68	1,0	100
1133	ND	ND	ND	125
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
807	14,5	33	1,0	50
1201	ND	ND	ND	100
812	ND	ND	ND	125
1086	17,7	55	1,0	50
1201	ND	ND	ND	100
1098	12,4	53	1,0	75

1336	20,3	57	1,1	94
370	6,5	17	0,1	36

1565	23	65	1,1	113
559	8	19	0,1	49

Abreviaturas: Vt: volumen corriente; RR: frecuencia respiratoria; T<sub>I</sub>: tiempo inspiratorio; T<sub>I</sub>/T<sub>TOT</sub>: relación entre el tiempo inspiratorio y el tiempo total de cada ciclo respiratorio; VO<sub>2</sub>: consumo de oxígeno; RQ: cociente respiratorio. WR: carga máxima tolerada en el cicloergómetro.

TABLA 9. Distribución porcentual (inmunohistoquímica con anticuerpos monoclonales anti-isoformas de las MyHCs) y tamaño fibrilar

**DIAFRAMA**

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Paciente	TIPO I %	TIPO II %	Tipo I (Dmin, $\mu\text{m}$ )	Tipo I (Dmin, SD)	Tipo II (Dmin, $\mu\text{m}$ )	Tipo II (Dmin, SD)	Diámetro Global ( $\mu\text{m}$ )
1	ND	ND	ND	ND	ND	ND	ND
2	34	66	31,0	6,2	30,4	7,9	30,6
4	30	70	38,5	10,5	46,8	7,2	44,3
6	57	43	44,0	7,0	41,8	8,7	43,1
8	51	49	49,1	13,4	59,7	10,0	54,3
10	56	44	45,4	9,2	45,4	6,5	45,4
11	48	52	50,1	10,4	51,1	10,6	50,6
12	ND	ND	ND	ND	ND	ND	ND
14	ND	ND	ND	ND	ND	ND	ND

X	46	54	43,0	9,4	45,9	8,5	44,7
$\pm$ SD	11	11	7,2	2,6	9,8	1,6	8,1

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17	59	41	45,6	10,3	50,4	5,6	47,6
18	67	33	44,4	14,9	71,0	13,5	53,2
19	57	43	37,1	8,3	35,6	7,6	36,5
20	48	52	43,3	10,7	50,3	13,2	46,9
21	ND	ND	ND	ND	ND	ND	ND
22	42	58	41,0	8,5	36,3	7,4	38,3
23	49	51	40,8	9,6	43,1	7,1	42,0
24	ND	ND	ND	ND	ND	ND	ND
25	65	35	42,8	9,2	47	10,6	44,3
29	55	45	37,0	8,5	41,6	9,2	39,1
34	60	40	44,9	12,4	41,4	8,2	43,5

X	56	44	41,9	10,3	46,3	9,1	43,5
$\pm$ SD	8	8	3,2	2,2	10,7	2,7	5,3

GLOBAL X	52	48	42,3	9,9	46,1	8,9	44,0
$\pm$ SD	10	10	5,0	2,3	10,0	2,3	6,3

Abreviaturas: **MyHC**: cadenas pesadas de miosina; **Dmín**: diámetro mínimo; **SD**: desviación estándar de la distribución fibrilar (índice de la "heterogeneidad" en la distribución);  **$\mu\text{m}$** : micrómetros.



TABLA 10. Distribución porcentual (inmunohistoquímica con anticuerpos monoclonales anti-isoformas de las MyHCs) y tamaño fibrilar

**INTERCOSTAL EXTERNO**

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Paciente	TIPO I (%)	TIPO II (%)	Tipo I (Dmin, $\mu\text{m}$ )	Tipo I (Dmin, SD)	Tipo II (Dmin, $\mu\text{m}$ )	Tipo II (Dmin, SD)	Diámetro Global ( $\mu\text{m}$ )
3	43	57	33,3	6,7	34,4	7,0	33,9
5	83	17	45,6	10,1	39,8	14,0	44,6
7	64	36	29,9	5,6	26,7	5,6	28,8
9	65	35	37,2	5,2	38,3	9,6	37,6
12	42	58	41,5	10,8	56,5	7,4	23,7
13	53	47	45,7	8,4	42,6	9,4	44,2
14	ND	ND	ND	ND	ND	ND	ND
X	58	42	38,9	7,8	39,7	8,8	35,5
$\pm\text{SD}$	16	16	6,5	2,3	9,9	2,9	8,4

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15	40	60	40,7	7,7	44,0	8,5	42,7
16	40	60	52,5	8,2	54,2	7,6	53,4
20	43	57	55,4	7,4	37,9	7,3	45,5
21	82	18	37,8	8,4	32,4	7,5	36,9
22	ND	ND	ND	ND	ND	ND	ND
26	37	63	48,5	6,3	49,6	8,0	49,2
27	79	21	46,8	7,1	43,9	11,7	46,2
28	65	35	50,9	4,6	51,7	8,7	51,3
30	39	61	35,2	6,3	37,8	7,4	36,8
31	46	54	50,0	7,6	49,2	8,2	49,6
32	75	25	36,8	6,7	36,6	5,4	36,7
33	46	54	65,0	7,4	59,0	8,2	61,8
X	54	46	47,2	7,1	45,1	8,1	46,4
$\pm\text{SD}$	18	18	9,0	1,1	8,4	1,5	7,9
GLOBAL X	55	45	44,3	7,3	43,2	8,3	42,5
$\pm\text{SD}$	17	17	9,0	1,6	9,0	2,1	9,4

Abreviaturas: ver tablas anteriores.

TABLA 11. Distribución porcentual (inmunohistoquímica con anticuerpos monoclonales anti-isoformas de las MyHCs) y tamaño fibrilar

**DELTOIDES**

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Paciente	TIPO I (%)	TIPO II (%)	Tipo I (Dmin, $\mu\text{m}$ )	Tipo I (Dm, SD)	Tipo II (Dmin, $\mu\text{m}$ )	Tipo II (Dmin, SD)	Diámetro Global ( $\mu\text{m}$ )
1	47	53	54,2	10,4	61,4	9,8	57,9
2	34	66	50,8	8,7	53,0	9,5	52,3
4	52	48	64,5	18,0	67,7	21,0	66,0
6	37	63	53,1	9,2	62,8	17,6	59,2
8	51	49	58,4	16,5	55,5	12,5	57,0
10	39	61	43,8	8,4	43,0	9,4	43,3
11	ND	ND	ND	ND	ND	ND	ND
12	ND	ND	ND	ND	ND	ND	ND
14	ND	ND	ND	ND	ND	ND	ND

X	43	57	54,1	11,9	57,2	13,3	56,0
$\pm$ SD	8	8	7,0	4,3	8,7	4,9	7,6

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17	ND	ND	ND	ND	ND	ND	ND
18	ND	ND	ND	ND	ND	ND	ND
19	47	53	25,6	5,6	35,3	5,1	30,8
20	39	61	62,0	10,2	52,3	10,8	61,2
21	ND	ND	ND	ND	ND	ND	ND
22	33	67	38,5	7,8	ND	ND	ND
23	ND	ND	ND	ND	ND	ND	ND
24	ND	ND	ND	ND	ND	ND	ND
25	22	78	55,3	10,8	54,8	12,2	54,9
29	45	55	49,4	11,6	44,2	10,8	46,6
34	24	76	48,4	7,6	43,3	9,9	44,5

X	35	65	46,6	8,9	46,0	9,8	47,6
$\pm$ SD	11	11	12,9	2,3	7,8	2,7	11,5

GLOBAL X	39	61	50,3	10,4	52,1	11,7	52,2
$\pm$ SD	10	10	10,6	3,6	9,8	4,3	10,1

Abreviaturas: ver tablas anteriores.

TABLA 12. a) Actividad enzimática fibrilar (actividad histoquímica ATPasa)  
b) Actividad enzimática muscular global

**DIAFRAGMA**

a)

Paciente	ATPasa I (%)	ATPasa IIa (%)	ATPasa IIb (%)
1	58	42	0
2	52	39	9
4	43	44	13
6	42	48	10
8	48	34	18
10	54	34	12
11	51	41	8
12	49	41	10
14	74	22	4
X	52	38	9
±SD	10	8	5

b)

CS mmol.min <sup>-1</sup> .g <sup>-1</sup>	CPK mmol.min <sup>-1</sup> .g <sup>-1</sup>	LDH mmol.min <sup>-1</sup> .g <sup>-1</sup>	PFK mmol.min <sup>-1</sup> .g <sup>-1</sup>
67	550	148	64
114	3050	203	129
68	ND	ND	218
62	1100	175	109
181	1684	103	51
101	1125	234	84
94	670	148	93
161	1600	220	49
116	1250	138	54
107	1379	171	95
42	782	45	54

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17	58	38	4
18	55	30	15
19	51	22	27
20	55	30	15
21	39	41	20
22	40	60	0
23	42	39	19
24	63	31	6
25	72	20	8
29	54	42	4
34	65	28	7
X	54	35	11
±SD	11	11	8

154	624	149	209
57	ND	ND	42
104	2345	147	131
69	1820	234	13
133	1150	240	209
128	1248	265	78
ND	ND	ND	ND
100	1957	340	54
88	870	325	7
61	2230	244	36
71	1027	224	20
97	1475	241	80
33	625	66	77

GLOBAL X	53	36	11
±SD	10	10	7

102	1429	208	87
37	682	66	66

Abreviaturas: **ATPasa**: adenosin trifosfatasa; **CS**: citrato sintasa; **CPK**: creatin fosfoquinasa; **LDH**: lactato deshidrogenasa; **PFK**: fosfofructoquinasa.

TABLA 13. a) Actividad enzimática fibrilar (actividad histoquímica ATPasa)  
b) Actividad enzimática muscular global

**INTERCOSTAL EXTERNO**

a)

Paciente	ATPasa I (%)	ATPasa IIa (%)	ATPasa IIb (%)
3	44	22	34
5	52	22	26
7	56	24	20
9	76	17	7
12	58	17	25
13	38	25	37
14	ND	ND	ND

X	54	21	25
±SD	13	3	11

29	43	30	27
26	50	20	30
13	45	55	0
14	52	48	0
15	50	14	36
27	35	34	31
28	34	30	36
30	52	43	5
31	45	40	15
32	40	41	29
33	43	44	23
34	47	37	16

X	45	36	21
±SD	6	12	13

GLOBAL X	48	31	22
±SD	10	12	12

b)

CS mmol.min <sup>-1</sup> .g <sup>-1</sup>	CPK mmol.min <sup>-1</sup> .g <sup>-1</sup>	LDH mmol.min <sup>-1</sup> .g <sup>-1</sup>	PFK mmol.min <sup>-1</sup> .g <sup>-1</sup>
93	1950	265	42
ND	ND	ND	ND
106	2350	253	51
ND	ND	ND	ND
114	2245	246	47
98	2132	260	38
123	2426	261	46

107	2221	257	45
12	187	7	5

75	4256	295	72
ND	ND	ND	ND
85	3434	363	129
49	4326	246	32
133	6867	173	70
62	4726	332	45
ND	ND	ND	ND
ND	ND	ND	ND
52	4450	326	84
ND	ND	ND	ND
ND	ND	ND	ND
47	4635	350	93

72	4671	298	75
30	1056	67	32

86	3552	271	63
29	1609	68	28

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Abreviaturas: ver tablas anteriores

TABLA 14. a) Actividad enzimática fibrilar (actividad histoquímica ATPasa)  
b) Actividad enzimática muscular global

**DELTOIDES**

a)

Paciente	ATPasa I (%)	ATPasa IIa (%)	ATPasa IIb (%)
1	49	34	17
2	42	38	20
4	46	36	18
6	40	40	20
8	56	29	15
10	48	34	18
11	42	38	20
12	ND	ND	ND
14	55	30	15

X	47	35	18
±SD	6	4	2

17	54	30	16
18	ND	ND	ND
19	55	30	15
20	48	34	18
21	ND	ND	ND
22	55	32	13
23	45	39	16
24	47	37	16
25	65	25	10
29	55	26	19
34	44	32	24

X	52	32	16
±SD	7	5	4

GLOBAL X	50	33	17
±SD	7	4	3

b)

CS mmol.min <sup>-1</sup> .g <sup>-1</sup>	CPK mmol.min <sup>-1</sup> .g <sup>-1</sup>	LDH mmol.min <sup>-1</sup> .g <sup>-1</sup>	PFK mmol.min <sup>-1</sup> .g <sup>-1</sup>
22	480	155	16
38	3137	220	171
34	ND	ND	ND
25	908	194	3
67	1584	117	143
58	929	247	15
55	627	166	42
47	1700	233	42
69	1405	143	26

46	1346	184	57
17	847	47	63

65	473	164	49
ND	ND	ND	ND
38	2146	168	154
67	1799	246	44
13	1030	284	4
73	1350	287	20
81	1615	247	5
62	2365	389	105
57	941	337	40
76	2163	272	54
143	1106	246	84

67	1499	264	56
33	621	68	47

57	1431	229	57
28	711	71	53

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Abreviaturas: ver tablas anteriores

TABLA 15. Densidad capilar

**DIAFRAMA**

C O N T R O L E S	Paciente	Caps/fibra	Fibras/cap	$\mu\text{m}^2/\text{capilar}$	Capilares/ $\mu\text{m}^2$	
	1	ND	ND	ND	ND	
	2	1,6	0,6	458,8	2,2	
	4	1,6	0,6	969,1	1,0	
	6	1,8	0,6	810,4	1,2	
	8	1,6	0,6	1458,0	0,7	
	10	1,8	0,6	899,3	1,1	
	11	1,6	0,6	1268,0	0,8	
	12	ND	ND	ND	ND	
	14	ND	ND	ND	ND	
	X	1,7	0,6	977,3	1,2	
	$\pm$ SD	0,1	0,04	351,7	0,5	
E P O C	17	3,5	0,3	115,2	2,0	
	18	ND	ND	ND	ND	
	19	2,5	0,4	418,5	2,4	
	20	3,5	0,3	501,6	2,0	
	21	ND	ND	ND	ND	
	22	4,8	ND	ND	ND	
	23	2,5	0,4	554,3	1,8	
	24	ND	ND	ND	ND	
	25	4,2	0,2	369,8	2,7	
	29	3,1	0,3	383,6	2,6	
	34	3,5	0,3	430,6	2,4	
		X	3,4	0,3	396,2	2,3
		$\pm$ SD	0,8	0,1	140,0	0,3
		GLOBAL X	2,7	0,5	664,4	1,8
	$\pm$ SD	1,1	0,2	390,2	0,7	

Abreviaturas: **Caps/fibra**: número de capilares por fibra; **fibras/cap**: número de fibras irrigadas por cada capilar; **( $\mu\text{m}^2$ )/capilar**: área fibrilar irrigada por un capilar; **capilares/ $\mu\text{m}^2$** : número de capilares por área fibrilar.

TABLA 16. Densidad capilar

**INTERCOSTAL EXTERNO**

C O N T R O L E S	Paciente	Caps/fibra	Fibras/cap	$\mu\text{m}^2/\text{capilar}$	Capilares/ $\mu\text{m}^2$
	3	2,1	0,5	430,7	2,3
	5	2,8	0,4	559,1	1,8
	7	1,6	0,6	650,4	1,5
	9	2,1	0,5	541,6	1,9
	12	2,6	0,4	583,6	1,7
	13	2,6	0,4	ND	ND
14	ND	ND	ND	ND	
X	2,3	0,5	553,1	1,8	
$\pm\text{SD}$	0,5	0,1	79,9	0,3	
E P O C	15	2,8	0,4	512,5	2,0
	16	2,9	0,4	784,0	1,3
	20	3,2	0,3	525,4	1,9
	21	3,1	0,3	342,9	2,9
	22	3,0	0,3	ND	ND
	26	2,5	0,4	760,9	1,3
	27	3,9	0,3	734,2	1,4
	28	ND	ND	ND	ND
	30	2,4	0,4	442,9	2,3
	31	3,6	0,3	540,0	1,9
	32	3,1	0,3	347,3	2,9
	33	2,9	0,3	1020,4	1,0
	X	3,0	0,3	601,1	1,9
	$\pm\text{SD}$	0,4	0,05	217,5	0,7
	GLOBAL X	2,8	0,4	585,1	1,9
	$\pm\text{SD}$	0,6	0,1	181,1	0,6

Abreviaturas: ver tablas anteriores

TABLA 17. Densidad capilar

**DELTOIDES**

C O N T R O L E S	Paciente	Caps/fibra	Fibras/cap	$\mu\text{m}^2/\text{capilar}$	Capilares/ $\mu\text{m}^2$
	1	3,1	0,3	849,4	1,2
	2	3,1	0,3	686,3	1,5
	4	3,1	0,3	1105,1	0,9
	6	3,8	0,3	728,8	1,4
	8	2,2	0,5	1159,1	0,9
	10	2,2	0,5	668,8	1,5
	11	1,8	0,6	ND	ND
	12	ND	ND	ND	ND
	14	ND	ND	ND	ND
X	2,6	0,4	866,2	1,2	
$\pm\text{SD}$	0,6	0,1	216,0	0,3	
E P O C	17	ND	ND	ND	ND
	18	ND	ND	ND	ND
	19	1,7	0,6	448,4	2,2
	20	2,3	0,4	1081,5	0,9
	21	ND	ND	ND	ND
	22	ND	ND	ND	ND
	23	ND	ND	ND	ND
	24	ND	ND	ND	ND
	25	2,2	0,5	1076,1	0,9
	29	2,1	0,5	820,6	1,2
	34	2,3	0,4	666,5	1,5
	X	2,1	0,5	818,6	1,4
	$\pm\text{SD}$	0,3	0,1	271,9	0,5
	GLOBAL X	2,4	0,4	844,6	1,3
$\pm\text{SD}$	0,5	0,1	231,3	0,4	

Abreviaturas: ver tablas anteriores



TABLA 18. Datos antropométricos y nutricionales más representativos

	<b>Edad (años)</b>	<b>BMI (Kg/m<sup>2</sup>)</b>	<b>Hb (g/dl)</b>	<b>Proteínas (g/dl)</b>	<b>Albúmina (g/dl)</b>	
<b>CONTROLES</b>	X	56	25,43	13,4	6,7	4,1
	±SD	13	3,2	1,4	0,6	0,4
	↓	↓	↓	↓	↓	↓
		NS	NS	p<0.05	NS	NS
	↑	↑	↑	↑	↑	↑
<b>EPOC</b>	X	61	23,49	14,4	6,6	4,1
	±SD	10	4,5	1,2	0,5	0,4

TABLA 19. Variables más representativas de la función pulmonar

	<b>FEV<sub>1</sub> (%ref)</b>	<b>FEV<sub>1</sub>/FVC (%)</b>	<b>RV/TLC (%)</b>	<b>DL<sub>CO</sub> (%ref)</b>	<b>PaO<sub>2</sub> (mm Hg)</b>	
<b>CONTROLES</b>	X	94	76	37	98	90
	±SD	9	6	16	16	8
	↓	↓	↓	↓	↓	↓
		p<0.001	p<0.001	p<0.001	p<0.001	p<0.05
	↑	↑	↑	↑	↑	↑
<b>EPOC</b>	X	49	56	58	73	83
	±SD	18	9	12	18	11

Abreviaturas: Ver tablas anteriores

TABLA 20. Variables más representativas de fuerza de los músculos tanto respiratorios como periféricos

$P_{im, \text{máx}}$ (cm H <sub>2</sub> O)	$P_{im, \text{máx}}$ (%ref) (Wilson)	$spP_{im, \text{máx}}$ (%ref) (Morales)	$P_{i,es \text{máx}}$ (cm H <sub>2</sub> O)	$P_{i,di \text{máx}}$ (cm H <sub>2</sub> O)	Fuerza mano no dominante (dinas)
---	--	---	--	--	---

<b>CONTROLES</b>	X	-95	112	79	-80,7	106,4	35
	±SD	21	22	13	24,9	29,4	8
		↓	↓	↓	↓	↓	↓
		NS	p<0.05	p=0.08	NS	NS	p<0.05
		↑	↑	↑	↑	↑	↑
<b>EPOC</b>	X	-73	89	65	-71,1	100,0	28
	±SD	27	31	21	16,3	30,4	7

TABLA 21. Variables de reserva funcional y resistencia de los músculos respiratorios

$\overline{P_{i,di}} / P_{i,di \text{máx}}$	TTdi	TTmr	PMT (cm H <sub>2</sub> O)	Tlím (min)
---	------	------	------------------------------	---------------

<b>CONTROLES</b>	X	0,10	0,04	0,03	-79,1	14
	±SD	0,04	0,02	0,01	10,0	4
		↓	↓	↓	↓	↓
		NS	NS	NS	p<0.001	NS
		↑	↑	↑	↑	↑
<b>EPOC</b>	X	0,13	0,04	0,03	-51,5	10
	±SD	0,05	0,02	0,02	22,3	6

Abreviaturas: Ver tablas anteriores

TABLA 22. Parámetros ventilatorios, metabólicos y de carga durante el esfuerzo máximo en la prueba ergométrica

<b>Vt</b> (ml)	<b><math>\dot{V}O_2</math></b> (ml/Kg/min)	<b><math>\dot{V}O_2</math></b> %ref	<b><math>\dot{W}R</math></b> (watts)	<b><math>\dot{W}R</math></b> (%ref)
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**CONTROLES**

X	2298	29,4	82	175	89
±SD	401	8	8	31	17

↓	↓	↓	↓	↓
p<0.05	p=0.05	p<0.05	p<0.05	p=0.01
↑	↑	↑	↑	↑

**EPOC**

X	1336	20,3	57	94	59
±SD	370	6,5	17	36	21

*Abreviaturas:* Ver tablas anteriores

GRÁFICO 1. Porcentajes de fibras tipo I según la expresión de las isoformas de MyHC y la actividad ATPasa

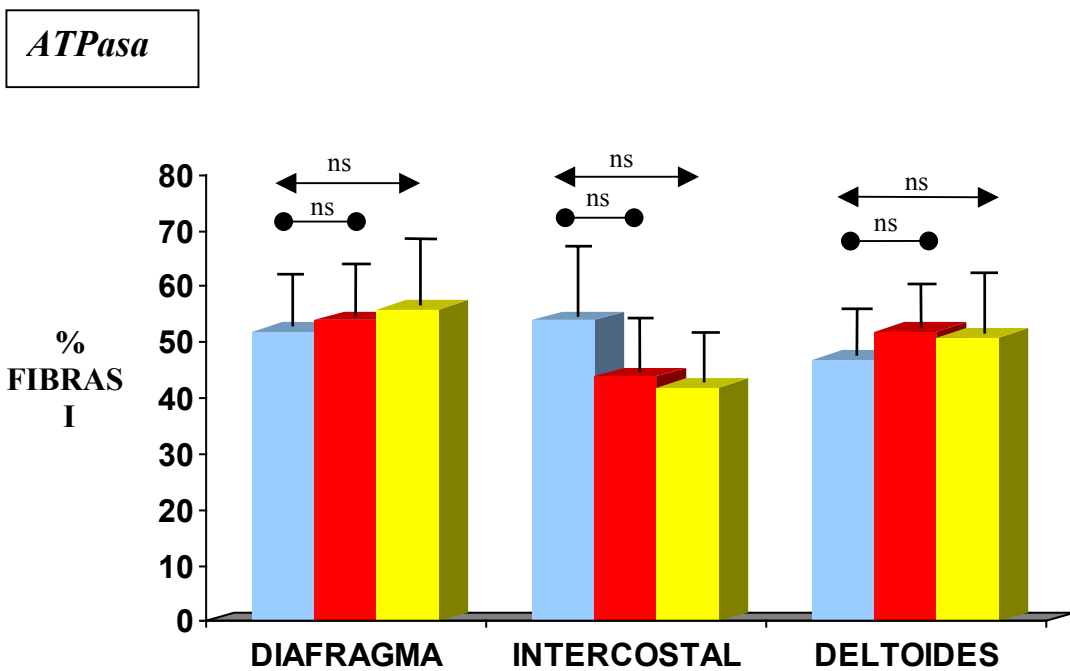
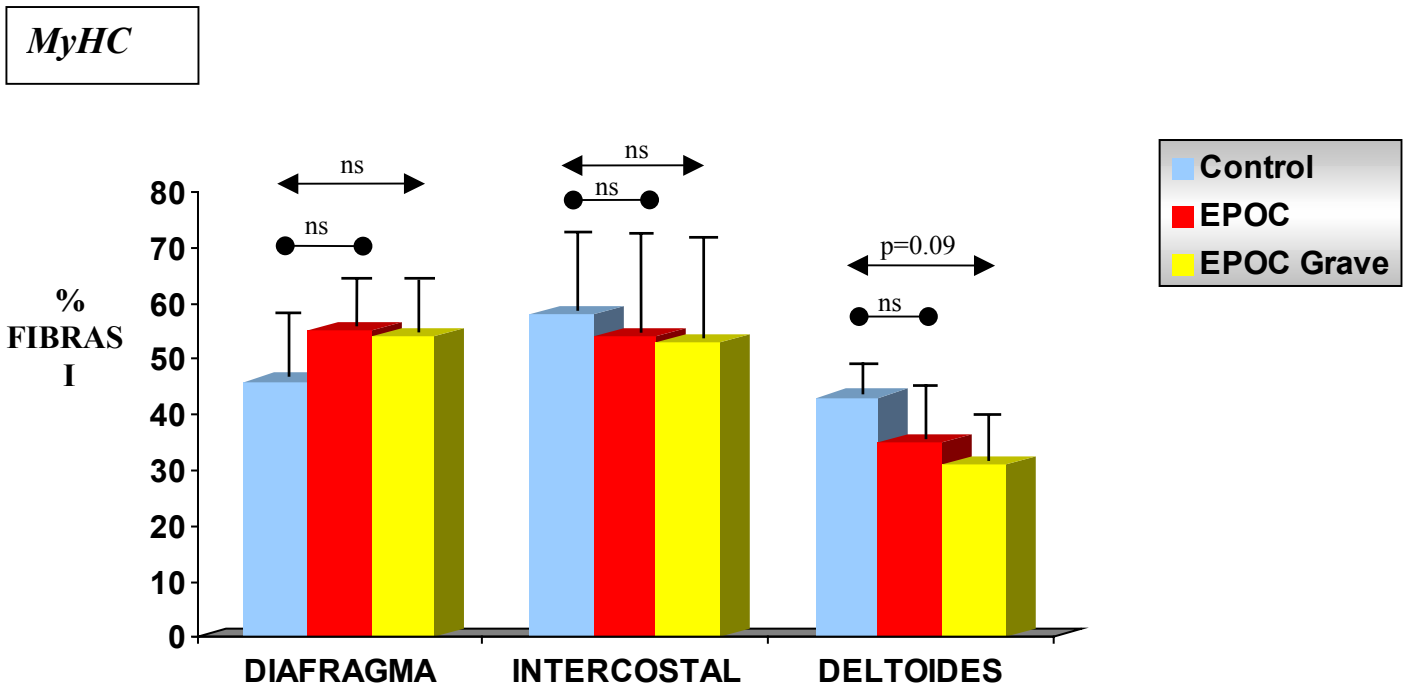
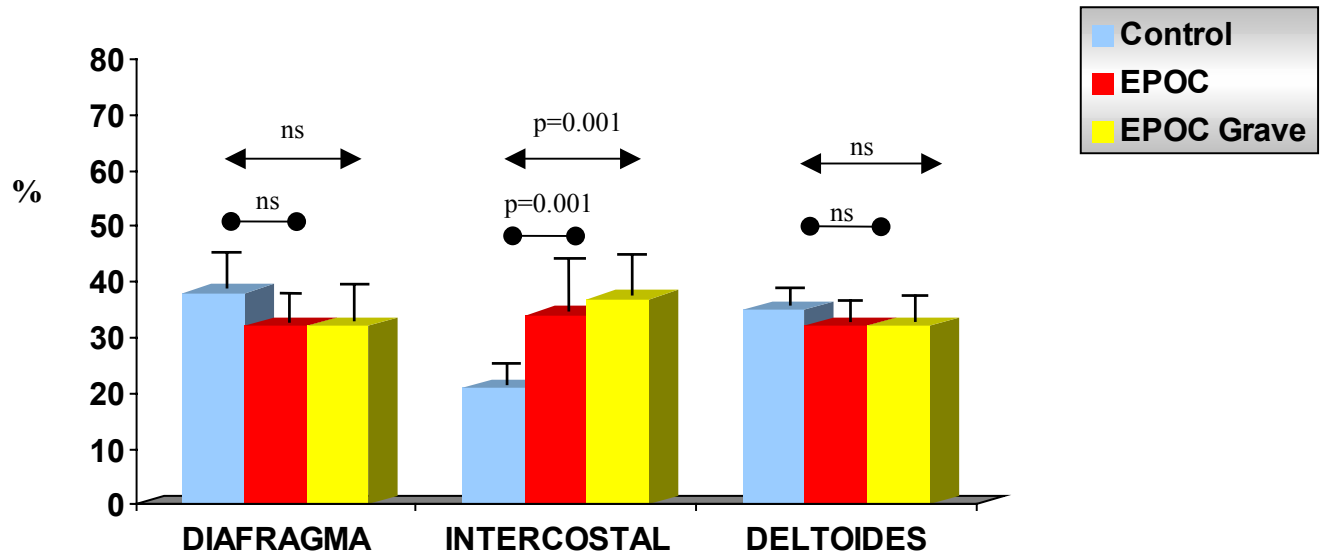


GRÁFICO 2. Porcentajes de ATPasa IIa y IIx

*ATPasa IIa*



*ATPasa IIx*

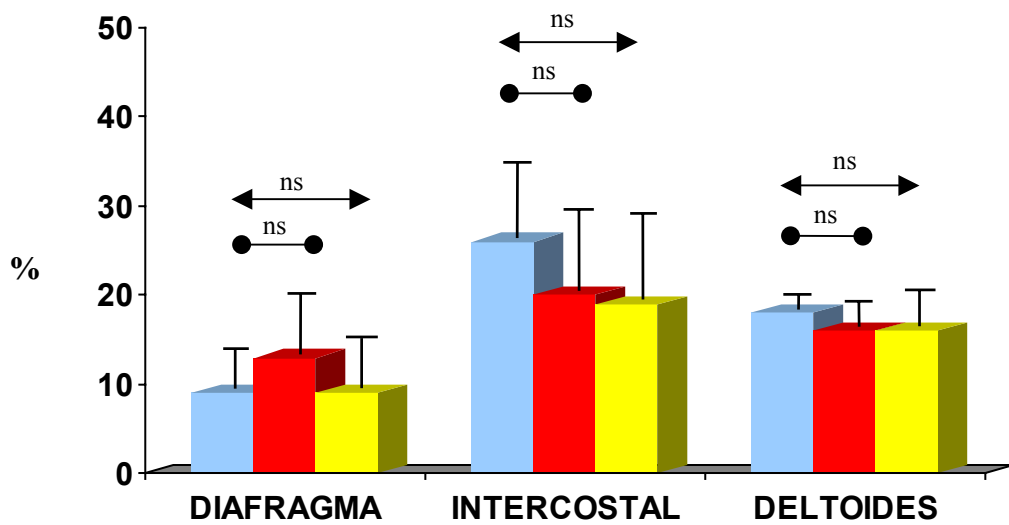


GRÁFICO 3. Tamaños fibrilares (tipificación según expresión de las isoformas de MyHC)

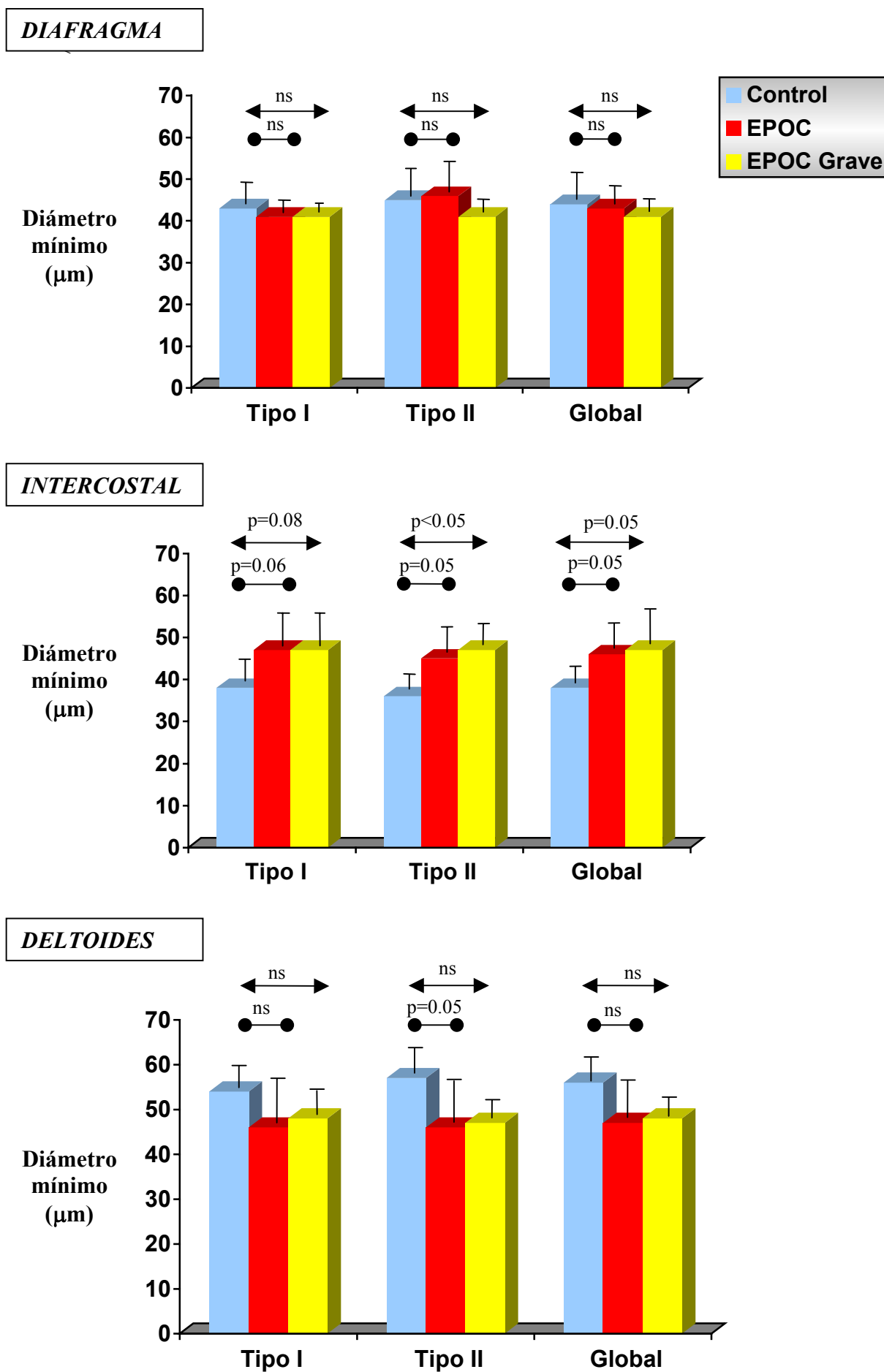
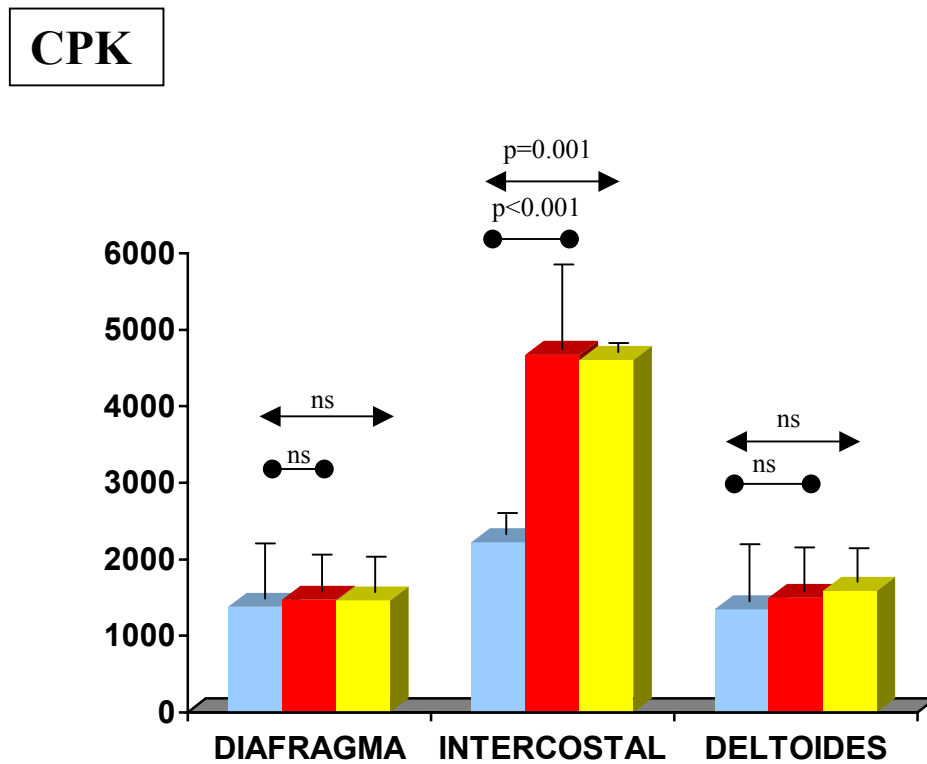
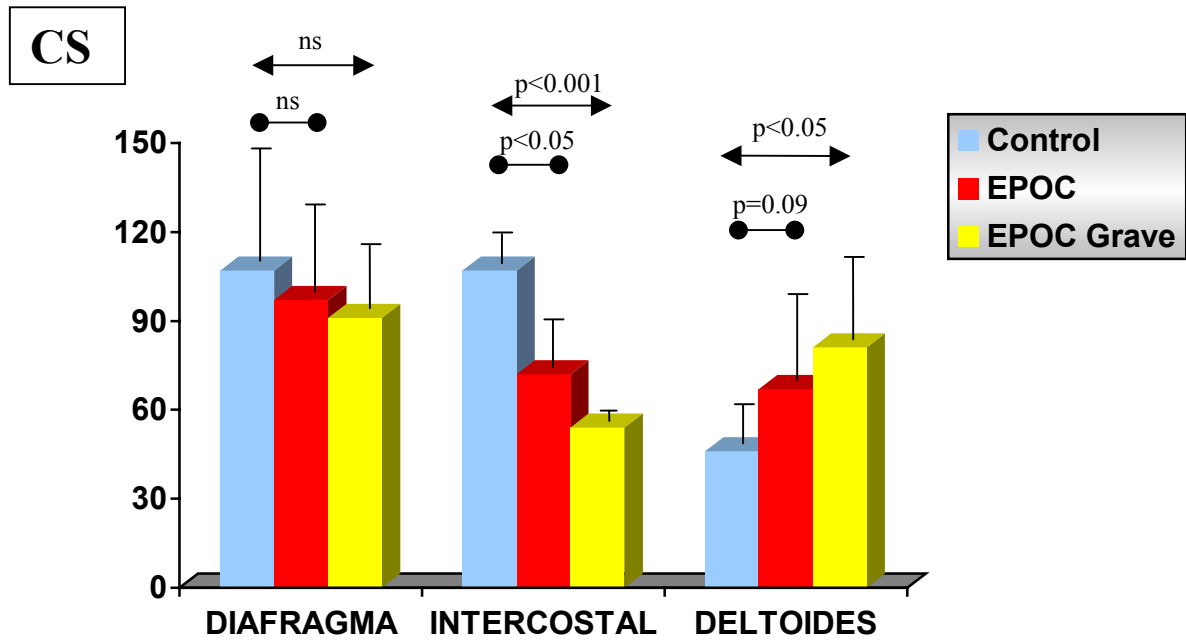


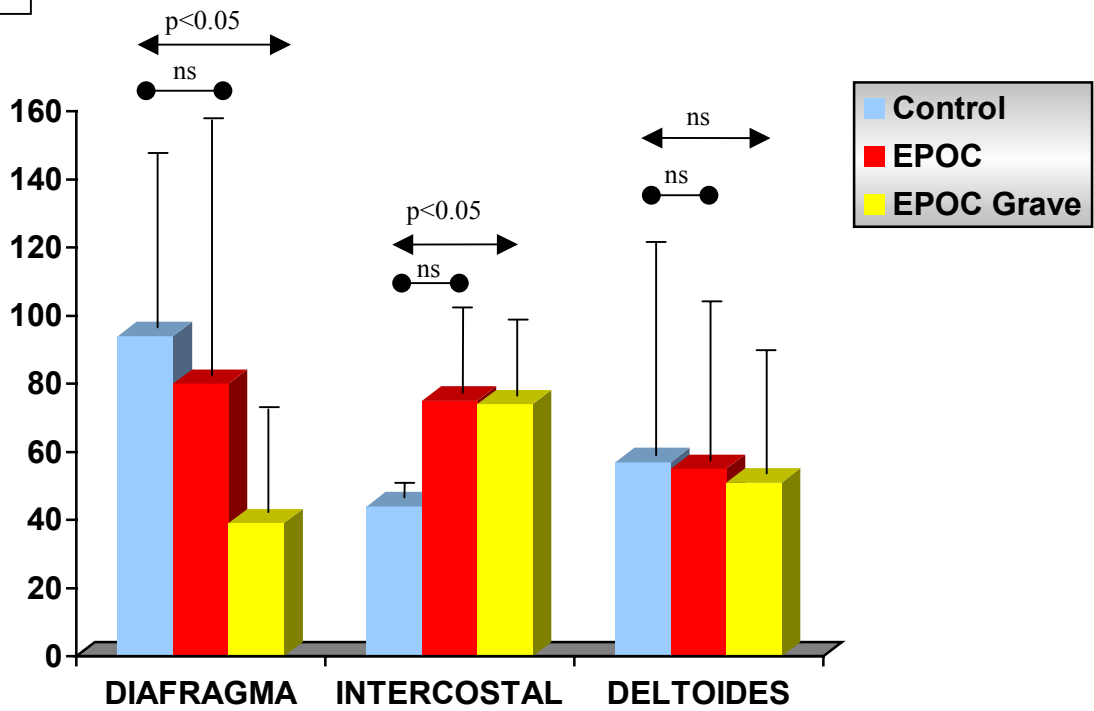
GRÁFICO 4A. Actividad enzimática muscular global: Capacidad oxidativa (CS) y almacenamiento energético (CPK)



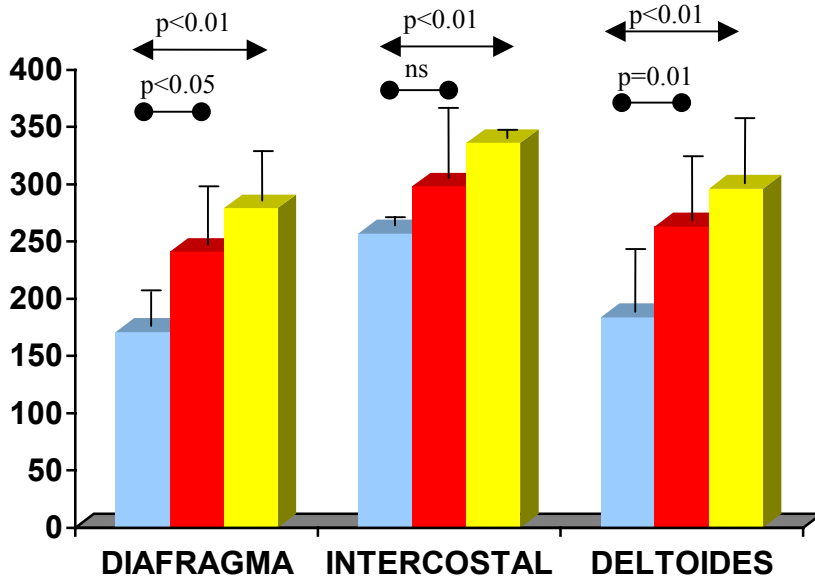
Abreviaturas: Ver tablas anteriores

GRÁFICO 4B. Actividad enzimática muscular global: Capacidad glicolítica

**PFK**



**LDH**

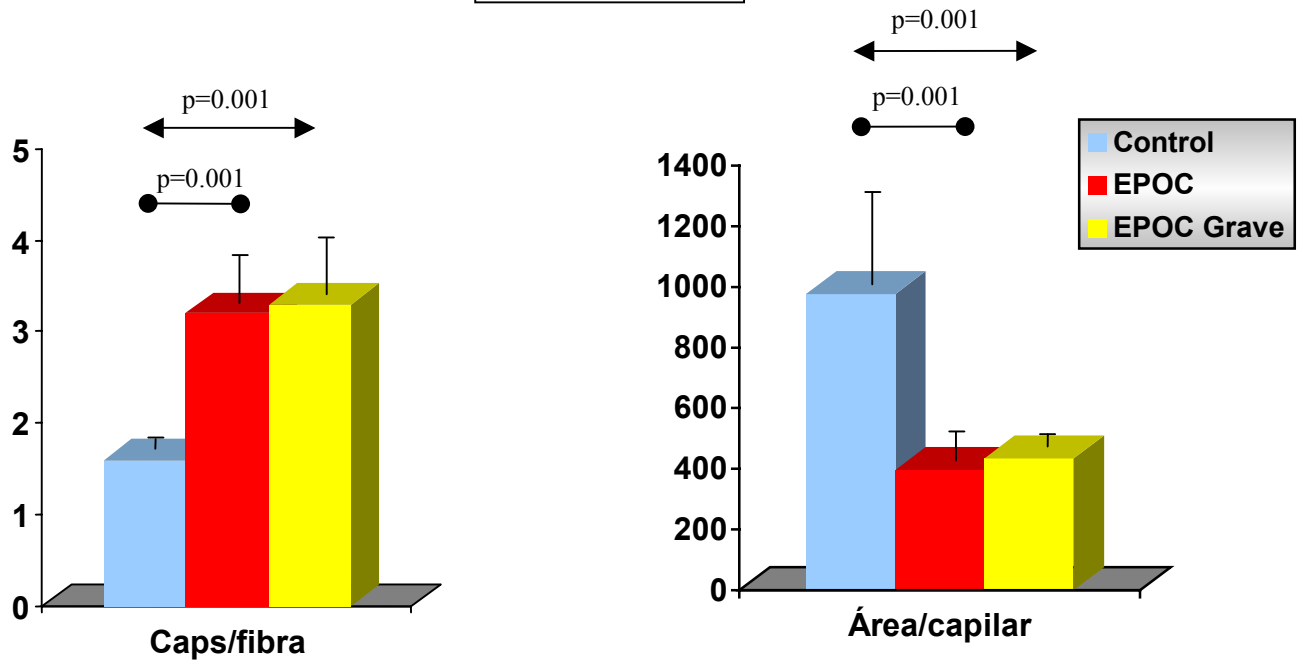


Abreviaturas: Ver tablas anteriores

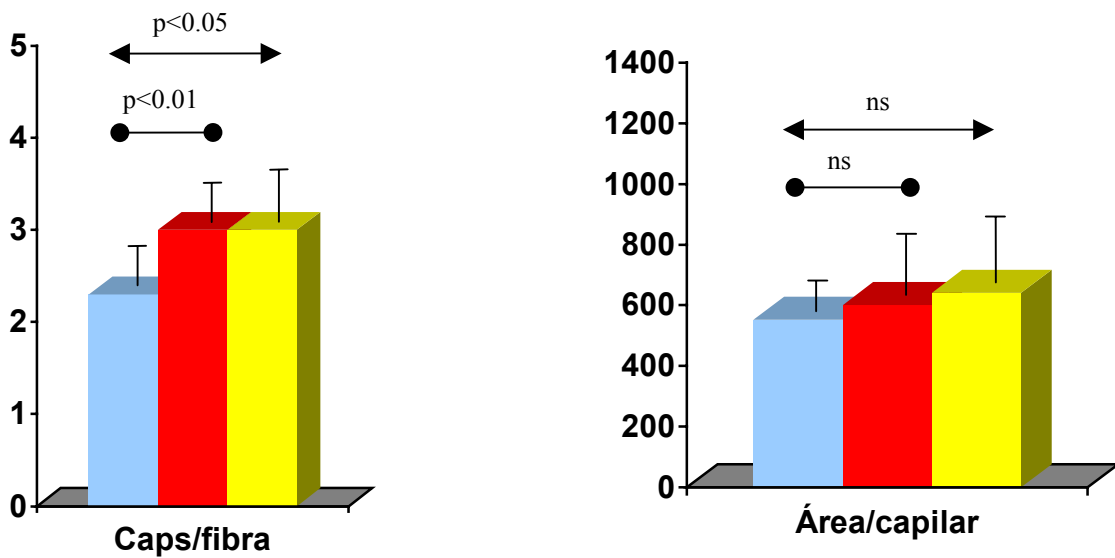


GRÁFICO 5. Densidad Capilar

**DIAFRAGMA**



**INTERCOSTAL EXTERNO**



**DELTOIDES**

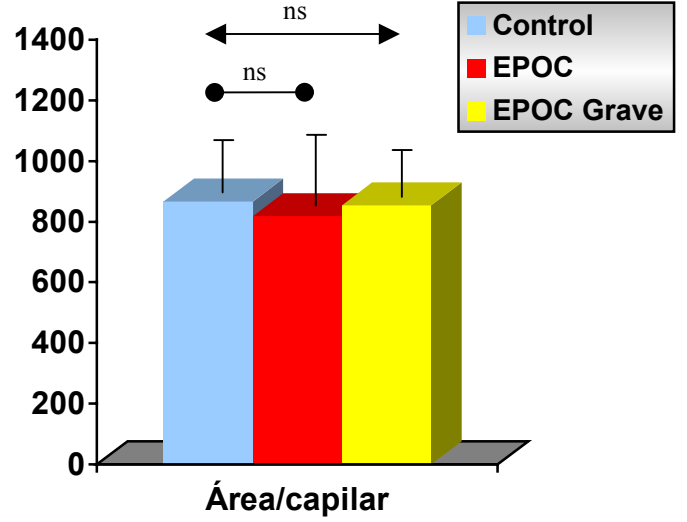
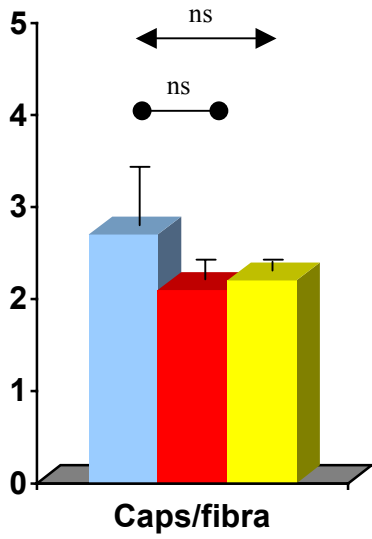
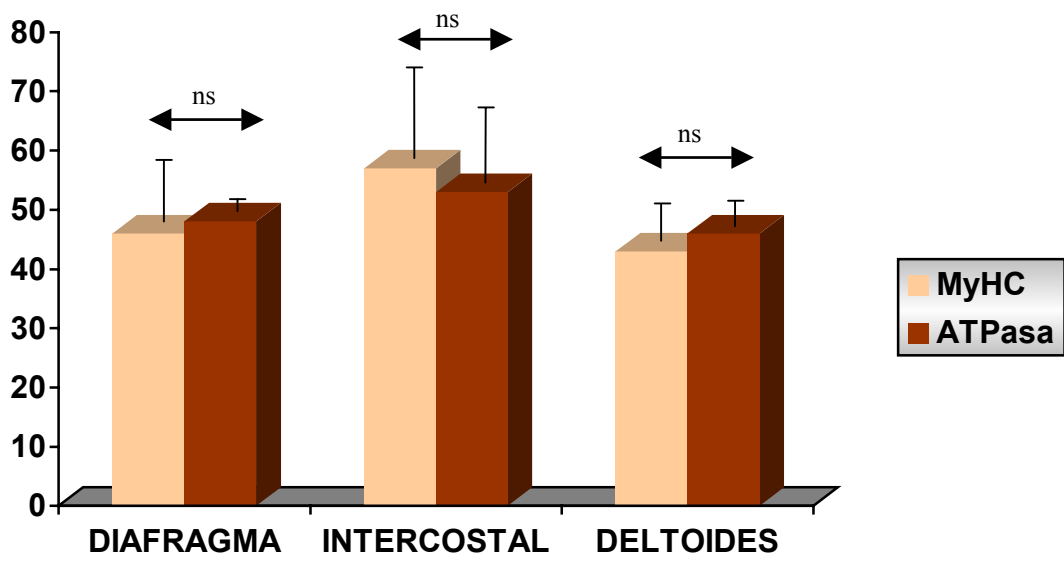
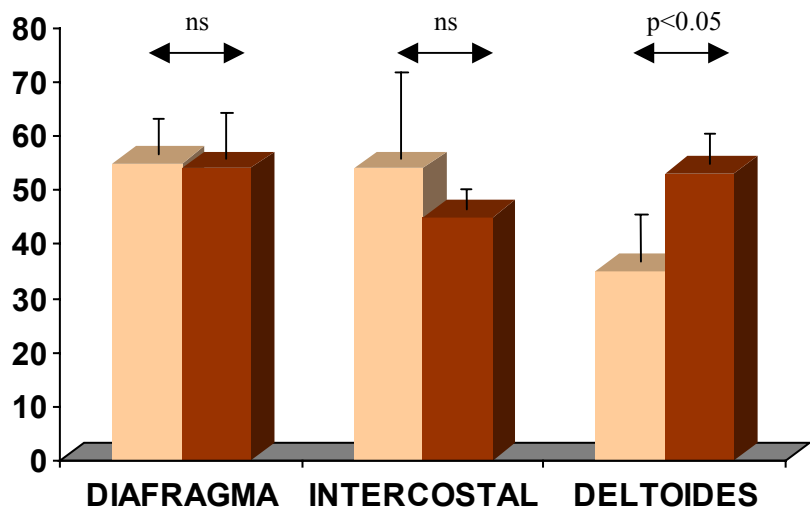


GRÁFICO 6. Comparación del porcentaje de fibras tipo I (oxidativas) por MyHC y ATPasa en los tres grupos analizados

**SUJETOS CONTROLES**



**PACIENTES CON EPOC**



**PACIENTES CON EPOC GRAVE**

