

# Changes Myokines Levels after Aerobic Training and Resistance Training in Post-Menopausal Females with Obesity



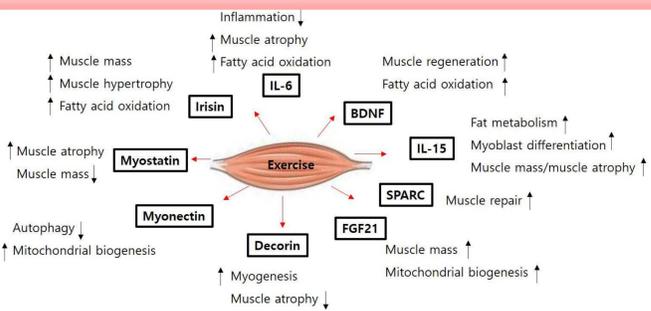
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## Introduction

- Henningsen et al. (2010) and Pedersen et al. (2012) have used the term of "myokines" to describe cytokines and other peptides that are expressed and released by muscle cells.
- During exercise or physical activity, myokines, cytokines, and other peptides are secreted by work out muscles within the muscle tissue or in an endocrine by targeting distant organs (Pedersen et al., 2012; Diaz et al., 2018)



## Purpose

Post menopausal female with obesity

**This study was to investigate changes in myokines levels after regular aerobic training and resistance training in post-menopausal females with obesity.**

## Methods

※ 41 participants who post-menopausal females with obesity

- Aerobic exercise group (n=21)
- Resistance exercise group (n=20)

- Post-menopausal (absence of a menstrual cycle for at least 1 year).
- Body fat percentage over than 30%
- Exercise duration and frequency: 50 min (30min main exercise), 3 days of week, 50~60% HRR

**Aerobic Ex. (n = 21)**  
50 min (30min main exercise), 3 days of week, 50~60% HRR

**Resistance Ex. (n = 20)**  
50 min (30min main exercise), 3 days of week, 55~65% 1RM

Timeline: Baseline, 6 weeks, 12 weeks

## Results

Measurements of of each body composition by group and time

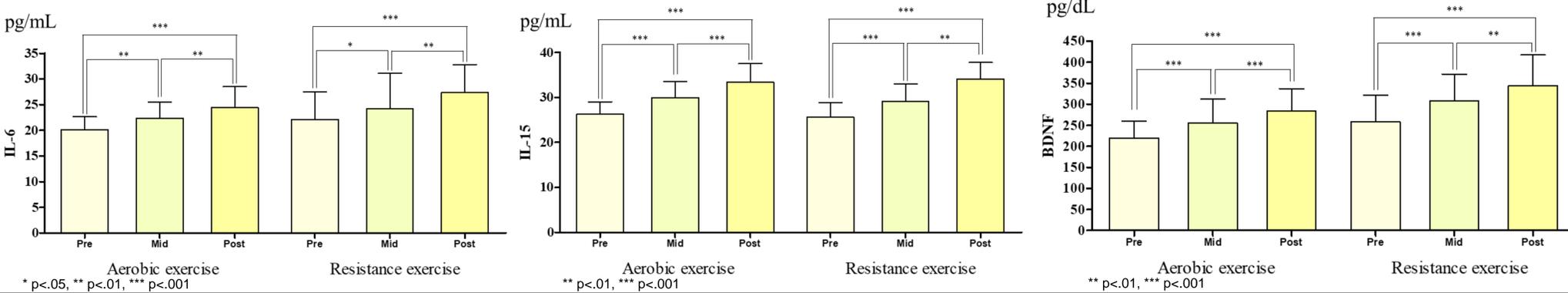
Variable	time	Type of exercise		p-value (interaction)
		Resistance exercise (n=20)	Aerobic exercise (n=21)	
Weight (kg)	Baseline	62.82 ± 10.09 <sup>a*</sup>	62.06 ± 9.19 <sup>a**</sup>	0.050
	6 weeks	62.57 ± 9.70	60.90 ± 9.00 <sup>b**</sup>	
	12 weeks	61.58 ± 8.92 <sup>c*</sup>	60.69 ± 9.24	
BMI (kg/m <sup>2</sup> )	Baseline	25.16 ± 3.67 <sup>a*</sup>	25.67 ± 3.67 <sup>a**</sup>	0.024
	6 weeks	25.12 ± 3.68	25.15 ± 3.58 <sup>b***</sup>	
	12 weeks	24.69 ± 3.29 <sup>c*</sup>	25.07 ± 3.70	
% fat (%)	Baseline	36.02 ± 5.87 <sup>a**</sup>	36.53 ± 5.89 <sup>a***</sup>	0.983
	6 weeks	34.52 ± 6.09 <sup>b*</sup>	34.90 ± 5.55 <sup>b***</sup>	
	12 weeks	33.88 ± 5.17	34.30 ± 5.28 <sup>c*</sup>	
Muscle mass (kg)	Baseline	21.60 ± 3.00 <sup>a*</sup>	21.26 ± 2.98	0.295
	6 weeks	22.10 ± 3.10	21.34 ± 3.01	
	12 weeks	22.02 ± 3.17	21.47 ± 3.15	
WHR	Baseline	0.91 ± 0.05 <sup>a*</sup>	0.91 ± 0.05 <sup>a**</sup>	0.519
	6 weeks	0.89 ± 0.05	0.89 ± 0.04	
	12 weeks	0.89 ± 0.04 <sup>c*</sup>	0.89 ± 0.04	
SBP (mmHg)	Baseline	129.6 ± 18.3 <sup>a*</sup>	129.2 ± 16.4	0.987
	6 weeks	130.8 ± 16.1	130.3 ± 15.9	
	12 weeks	122.6 ± 19.3 <sup>c**</sup>	122.7 ± 11.7 <sup>c*</sup>	
DBP (mmHg)	Baseline	81.00 ± 8.69	82.00 ± 9.95	0.636
	6 weeks	84.40 ± 10.80	85.90 ± 9.43	
	12 weeks	80.00 ± 11.01 <sup>c**</sup>	79.14 ± 10.22 <sup>c*</sup>	

a: pre vs. post; b: pre vs. mid; c: mid vs. post.  
\* p<.05, \*\* p<.01, \*\*\* p<.001

Measurements of each physical fitness by group and time

Variable	time	Type of exercise		p-value (interaction)
		Resistance exercise (n=20)	Aerobic exercise (n=21)	
Muscle strength (kg)	Baseline	21.18 ± 5.10	19.72 ± 6.53 <sup>a*</sup>	0.389
	6 weeks	22.60 ± 5.30	22.67 ± 5.17 <sup>b*</sup>	
	12 weeks	21.64 ± 4.63	21.81 ± 4.51	
Flexibility (cm)	Baseline	14.72 ± 8.02	17.68 ± 6.17 <sup>a*</sup>	0.293
	6 weeks	18.20 ± 6.01 <sup>b*</sup>	19.78 ± 6.41 <sup>b**</sup>	
	12 weeks	17.24 ± 6.71	19.97 ± 6.82	
Muscle endurance (rep/30s)	Baseline	14.05 ± 11.88 <sup>a***</sup>	10.48 ± 8.35 <sup>a***</sup>	0.489
	6 weeks	19.35 ± 11.86 <sup>b**</sup>	13.52 ± 9.51 <sup>b**</sup>	
	12 weeks	20.80 ± 13.04	16.26 ± 9.10 <sup>c*</sup>	
Power (cm)	Baseline	121.85 ± 24.27 <sup>a**</sup>	115.26 ± 22.93	0.309
	6 weeks	129.75 ± 22.64 <sup>b**</sup>	121.52 ± 18.39	
	12 weeks	131.95 ± 24.47	115.42 ± 32.31	
Agility (rep/20s)	Baseline	28.50 ± 3.68 <sup>a***</sup>	28.04 ± 5.13 <sup>a***</sup>	0.710
	6 weeks	32.45 ± 4.11 <sup>b***</sup>	31.83 ± 3.10 <sup>b***</sup>	
	12 weeks	34.10 ± 4.32 <sup>c**</sup>	32.96 ± 3.84	

Muscle strength: grip strength, Flexibility: sit and reach, Muscle endurance: sit-up, Power: vertical jump, Agility: side-step  
a: pre vs. post; b: pre vs. mid; c: mid vs. post.  
\* p<.05, \*\* p<.01, \*\*\* p<.001



## Conclusion

**Aerobic exercise training and resistance exercise training can change myokines levels and improve body composition and physical fitness of obese females. These findings provide preliminary evidence that obese females need to exercise or perform physical activity to improve their myokines levels and physical fitness.**

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