Critical Reviews™ in Physical and Rehabilitation Medicine
2020 Vol.32, Issue.4 pp.183-189
ISSN(e): 0896-2960
ISSN(p): 2162-6553
DOI: 10.1615/CritRevPhysRehabilMed.v32.i4

INFLUENCE OF AEROBIC EXERCISE ON THE BRAWN STEM CELLS FIBERS

Tran Phuong Tung[1]
Dao Chanh Thuc[2,3]

[1]*Van Lang University, Ho Chi Minh City, Vietnam*
[2]*An Giang University, Vietnam*
[3]*Vietnam National University, Ho Chi Minh City, Vietnam*

thuchus@gmail.com
(+ Corresponding author)

ABSTRACT

Satellite cells are indispensable for skeletal muscle repair and regeneration and are associated with muscle growth in humans [1]. Aerobic exercise training results in improved skeletal muscle health also translating to an increase in satellite cell pool activation. We postulate that aerobic exercise improves satellite cell function in skeletal muscle.

Article History

Keywords
Influence
Aerobic
Exercise
Skeletal muscle
Training
Health

Contribution/Originality:

1. INTRODUCTION

Skeletal muscle is one of the largest organs of the human body and plays an essential role in whole-body locomotion. It also acts as an important nutrient store and serves as a source of glucose disposal, maintaining whole-body homeostasis. Skeletal muscle possesses a remarkable plasticity and can respond to a wide range of stimuli such as injury, damage, and exercise. Regular exercise results in improvements in various metabolic and structural aspects of skeletal muscle health. Resistance exercise training has long been associated with increases in skeletal muscle mass characterized by increases in muscle fiber cross-sectional area (CSA) [2, 3]. Alternatively, aerobic exercise training, including moderate-intensity continuous training (MICT), high-intensity interval training (HIT), and sprint interval training (SIT) [4] is associated not only with structural remodeling of muscle fibers toward a more oxidative phenotype but also with increases in mitochondrial protein content and function and increased capillary density [5, 6]. Over the years, extensive research has focused on understanding the molecular basis for structural and functional adaptations that occur in skeletal muscle after exercise training.

Satellite cells (SCs) are muscle-specific stem cells that are essential in skeletal muscle repair and regeneration [7, 8]. Specifically, SCs reside between the sarcolemma and the basal lamina, an area referred to as the SC niche [9]. The muscle fiber to which the SC is associated also composes part of the niche and thus, SCs respond to various signals originating from the muscle fiber [9]. When SCs become activated, they proliferate and differentiate, eventually fusing to existing muscle fibers and donating their nuclei and thereby supporting skeletal muscle fiber repair [8] and growth [10, 11]. It is important to note, however, that on activation, a subset of SCs will revert to quiescence, thereby maintaining the SC pool [12]. The extent to which SCs facilitate exercise-induced adaptations is not clear, but further studies are warranted and of keen interest to investigators in the field of exercise science.

2. THE EFFECT OF AEROBIC EXERCISE ON SC FUNCTION