ABSTRACT

Sarcopenia, an age-related disease where loss of muscle and strength progresses, has become a research interest for scientists over the past few decades. Sarcopenia in and of itself can cause physical incapacity, functional impairment, and even death to patients. Research has shown that mitochondrial dysfunction has been known to cause sarcopenic muscle tissue damage. Furthermore, recent studies have found that the Rrm2b gene may have a correlation with the mitochondrial homeostasis in skeletal muscle tissue. However, no comprehensive studies have been able to explain the underlying mechanisms on how the Rrm2b gene affects muscle tissues. Therefore, this research helps to uncover a small portion of the correlation between Rrm2b gene and skeletal muscle tissue by using a mice model with a knockout of the Rrm2b gene only in the skeletal muscle tissue. Furthermore, the effect of age was also tested to see the differences in Rrm2b knockout and control mice. In this experiment, molecular analyses such as qPCR and Western blot analysis are used to understand the reality of mitochondrial homeostasis and other related proteins after the loss of function of the Rrm2b gene. In addition, IHC staining was performed to determine the phenotypic changes of the Rrm2b knockout mice model. Results have shown that age does have a significant difference in Rrm2b knockout mice compared to the control. However, the comparison between knockout and control mice have no significant difference in the same age experimental group if huge error bars are taken into consideration. In addition, the result shown from IHC staining does not show any distinguishable signal in any of tissue, including the positive control and therefore results were considered to be inconclusive. It is suggested that further replication of the experiment is needed to create reliability of the results.

Keywords: *Sarcopenia; Rrm2b gene; In-vivo study; Mice model; Mitochondrial Homeostasis; Skeletal Muscle Tissue*