

Mitochondrial involvement in fibromyalgia and melatonin protective effect

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Fibromyalgia (FM) is considered as one of the most common musculoskeletal disorder associated with a chronic pain condition. The principal characteristic of this condition is a widespread pain often associated with sleep disorders, fatigue and consequent anxiety and/or depression. Due to the prevalence of this pathology, recent studies aimed at increasing understanding of both its pathogenesis and treatment have been conducted, but the knowledge is far behind other chronic illnesses in both mechanism understanding as well as appropriate therapeutic approaches [1]. Recent studies reported that in FM patients the metabolism of a powerful antioxidant that is Coenzyme Q10 (CoQ10), called also ubiquinone, is altered showing a new potential marker for this disorder. For study FM several potential animal models have been described, among that reserpine-induced myalgia (RIM) rats are considered a putative model of this pathology showing musculoskeletal alterations and also depressive-like behaviours. Recent evidences suggest that melatonin, an indoleamine with multitasking properties, among which anti-inflammatory and anti-oxidant effects, may be suitable in FM treatment [2].

In this study, we hypothesized that dietary melatonin administration in RIM animal model would support anti-inflammatory and anti-oxidant response in skeletal muscles reducing so the FM symptoms. In particular we focalized our attention to mitochondrial involvement investigating the roles of CoQ10, mitofusin 2 (MFN2) and peroxisome proliferator activated receptor gamma coactivator 1 alpha (PGC1 α) expression.

Our results showed that melatonin modulates mitochondria homeostasis and oxidative stress in RIM rats.

In summary this study showed that melatonin could be a potential tool in the prevention and treatment of FM symptoms.

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References

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Key words

Fibromyalgia, Mitochondria, Melatonin, Oxidative stress.