

The Effect of Low and High Dose Curcumin Supplementation on Prevention and Treatment of Sarcopenia: The Concept of Hormesis

Authors : Sevana Daneghian, Leila Chodari, Sahar Mehranfar, Shadi Mohammadpour-Asl, Diman Mahdi

Abstract : Sarcopenia is an age-related muscle disease. Lack of antioxidant protection, and cumulative oxidative damage to skeletal muscle are recognized mechanisms. Curcumin is a hormetin as it has a stimulating effect in low doses and an inhibitory effect in high doses. The purpose of this study was to examine the effects of four weeks of curcumin supplementation in presarcopenic and sarcopenic rats, and likelihood of potential negative effects while co-exist with sarcopenia. The rats were divided into 7 groups: young sham rats, 18 months old; presarcopenic control, supplemented with 400 and 1500 mg/kg/day, 24 months old; Sarcopenia control, sarcopenia supplemented with 400 and 1500 mg/kg/day. MDA levels were significantly reduced in the low-dose pre-sarcopenic group compared to the control group. Compared to the corresponding control groups, SOD levels decreased in the groups treated with low-dose presarcopenic supplementation and increased in the high-dose sarcopenic supplemented. GPx levels increased at both doses only in the sarcopenic group compared to the control group. SIRT-1 only increased at low doses in the sarcopenic groups and PGC-1 α in both pre-sarcopenia groups compared to the corresponding control. IGF-1 increased compared to the control group at both doses in the pre-sarcopenic group and at high doses in sarcopenic group. Considering the hormetic effects of curcumin, it can be argued that, curcumin supplementation has some positive effects not only at low but also at high doses in both groups. This means that the high doses of curcumin have no negative synergistic effects in addition to oxidative stress during sarcopenia and high-dose supplementation in patients already suffering from high oxidative stress due to sarcopenia is safe and could be considered hormetic.

Keywords : curcumin, hormesis, sarcopenia, muscular atrophy, PGC protein, Sirtuins

Conference Title : ICFSN 2025 : International Conference on Food Science and Nutrition

Conference Location : New York, United States

Conference Dates : January 28-29, 2025