Methyl Palmitate: the Naturally Occurring Cardioprotective Agent

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Abstract

Cardioprotective agents are compounds that provide heart protection and decrease cardiotoxicity incidence. Cardiotoxicity is a serious condition that results in diminishing the heart's ability to pump blood throughout the body and can be developed into heart failure. Oxidative stress is an important pathogenic event in cardiotoxicity where the generated reactive oxygen species (ROS) cause myocardial cellular destruction. Moreover, apoptosis, fibrosis, and inflammatory cascades play major roles in cardiotoxicity pathogenesis. Recently, much attention has been paid to the cardioprotective effects of natural products. Methyl palmitate (MP) is a naturally occurring methyl ester that can be also synthesized. This review article aimed to elucidate the potential cardioprotective effects of MP as well as the underlying possible mechanisms. Indeed, MP showed effective cytoprotective roles in various experimental models. In this regard, MP showed potent antioxidant activity which was proven by the decreased production of oxidative stress markers and the increased activity of the endogenous antioxidant enzymes. It also exhibited anti-inflammatory activity which was evidenced by the reduced expression of the pro-inflammatory cytokines and the elevated expression of the anti-inflammatory cytokines. Moreover, MP showed anti-apoptotic activity evidenced by the elevated anti-apoptotic protein expression and the mitigated pro-apoptotic protein expression. Besides, further studies proved the anti-fibrotic and vasodilatation activities of MP. Thus, MP could provide major cardioprotective activities through its antioxidant, anti-inflammatory, anti-apoptotic, anti-fibrotic, and vasodilatation properties.
Keywords: Cardioprotection; Methyl palmitate; Antioxidant; Anti-inflammatory; Anti-apoptotic; Anti-fibrotic;
Vasodilatation.

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