Acute administration of red yeast rice (Monascus purpureus) depletes tissue coenzyme Q10 levels in ICR mice

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Abstract

In this study, we attempted to evaluate the effect of administration of a high quantity of red yeast rice on coenzyme Q10 (CoQ10) synthesis in the tissues of ICR mice. Eighty-eight adult male ICR mice were housed and divided into control and experimental groups for red yeast rice treatment. Animals were gavaged with a low (1 g/kg body weight) or a high dose (5 g/kg body weight, approximately five times the typical recommended human dose) of red yeast rice dissolved in soyabean oil. After gavagement, animals of the control group were immediately killed; mice of the experimental groups (eight for each subgroup) were killed at different time intervals of 0·5, 1, 1·5, 4 and 24 h. The liver, heart and kidney were taken for analysis of monacolin K (liver only) and CoQ10 analysis. Liver and heart CoQ10 levels declined dramatically in both groups administered red yeast rice, especially in the high-dose group, within 30 min. After 24 h, the levels of hepatic and cardiac CoQ10 were still reduced. A similar trend was also observed in the heart, but the inhibitory effect began after 90 min. The higher dose of red yeast rice presented a greater suppressive effect than did the lower dose on tissue CoQ10 levels. In conclusion, acute red yeast rice gavage suppressed hepatic and cardiac CoQ10 levels in rodents; furthermore, the inhibitory effect was responsive to the doses administered.