

عنوان مقاله:

Trans-sodium crocetinate suppresses apoptotic and oxidative response following myoglobin-induced cytotoxicity in HEK-۲۹۳ cells

محل انتشار:

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خلاصه مقاله:

Objective(s): Rhabdomyolysis (RM) is a serious fatal syndrome. The RM leads to acute kidney injury (AKI) as a fatal complication. The belief is that RM-induced AKI is triggered by myoglobin (MB). MB activates oxidative and apoptotic pathways. Trans-sodium crocetinate (TSC) is obtained from saffron. It has anti-oxidant and renoprotective effects. This research was designed to assess the mechanisms of MB-induced cytotoxicity in HEK-۲۹۳ cells (human embryonic kidney cells) as well as the possible effects of TSC against MB-induced cytotoxicity. Materials and Methods: HEK-۲۹۳ cells were exposed to diverse concentrations of TSC (۲.۵, ۵, ۱۰, ۲۰, ۴۰, ۸۰, and ۱۰۰ μ M) for ۲۴ hr. Then, MB (۹ mg/ml) was added to the cells. After ۲۴ hr, cell viability was measured through MTT, and the values of ROS generation were calculated using DCFH-DA assay. Also, autophagy and apoptosis markers in cells were assessed by western blot analysis. Results: MB decreased viability and increased ROS levels in HEK-۲۹۳ cells. However, pretreatment of HEK-۲۹۳ cells with TSC for ۲۴ hr reduced the cytotoxicity and ROS production caused by MB. Furthermore, MB enhanced both the apoptosis (cleaved caspase-۳ and Bax/Bcl-۲ ratio) and autophagy markers (LC۳II/I ratio and Beclin-۱) in HEK-۲۹۳ cells. On the other hand, TSC pretreatment condensed the levels of autophagy and apoptosis criteria in response to MB cytotoxicity. Conclusion: TSC has a positive effect in preventing MB-induced cytotoxicity in HEK-۲۹۳ cells by increasing anti-oxidant activity and regulation of apoptotic and autophagy signaling pathways.

کلمات کلیدی:

Apoptosis, Autophagy, Rabdomyolysis, Acute Kidney Injuries, Trans-sodium crocetinate, Myoglobin

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