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عنوان مقاله:

The cardioprotective effect of vanillic acid on hemodynamic parameters, malondialdehyde, and infarct size in ischemia-reperfusion isolated rat heart exposed to PM۱۰

محل انتشار:

مجله علوم پایه پزشکی ایران, دوره 20, شماره 7 (سال: 1396)

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خلاصه مقاله:

Objective(s): Particulate matter (PM) exposure can promote cardiac ischemia and myocardial damage. The effects of PM۱۰ on hemodynamic parameters, lipid peroxidation, and infarct size induced by ischemia-reperfusion injury and the protective effects of vanillic acid (VA) in isolated rat heart were investigated. Materials and Methods: Eighty male Wistar rats (۲۵۰–۳۰۰ g) were divided into ۸ groups (n=۱۰): Control, Sham, VAc, VA, PMa (۰.۵ mg/kg PM, intratracheal instillation), PMb (۲.۵ mg/kg PM, intratracheal instillation), PMc (۵ mg/kg PM, intratracheal instillation), and PMc + VA (۵ mg/kg PM, intratracheal instillation; and ۱۰ mg/kg vanillic acid, gavage for ۱۰ days). PM۱۰ was instilled into the trachea in two stages, within ۴۸ hr. After isolating the hearts and transfer to a Langendorff apparatus, hearts were subjected to ۳۰ min ischemia and ۶۰ min reperfusion. Hemodynamic parameters (±dp/dt, LVSP, LVDP, and RPP), production of lipid peroxidation (MDA), and infarct size were assessed. Results: A significant decrease in ±dp/dt, LVSP, LVDP and RPP occurred in PM groups. A significant increase in MDA and myocardial infarct size occurred in PM groups. A significant increase in LVDP, LVSP, ±dp/dt, RPP and decrease in infarct size, MDA, and myocardial dysfunction was observed in groups that received vanillic acid after ischemia–reperfusion. Conclusion: It was demonstrated that PM۱۰ increases MDA, as well as the percentage of cardiac infarct size, and has negative effects on hemodynamic parameters. This study suggests that vanillic acid may serve as an adjunctive treatment in delaying the progression of ischemic heart disease.

کلمات کلیدی:

Hemodynamic parameters, Infarct size, Ischemia–reperfusion, Malondialdehyde Particulate matter, Vanillic-acid

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