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MEETING ABSTRACT

A1.5

Effects of wine polyphenol resveratrol on the renal artery of diabetic rats

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Background: The anti-diabetic effects of resveratrol are well documented. It has been shown previously that vasorelaxation of rat renal artery (RA) induced by resveratrol is partly endothelium-dependent and involved nitric oxide production. The endothelium-independent relaxation of RA by resveratrol is mediated by activation of smooth muscle big calcium-sensitive potassium (BK_{Ca}) channels. However, the mechanisms by which resveratrol causes vaso-dilatation of RA from diabetic rats are not defined. Thus, the aim of this study was to investigate the mechanisms of resveratrol-induced vasorelaxation of RA from diabetic rats.

Methods: Insulin-dependent diabetes in male Wistar rats was induced by alloxan. Rings of RA were mounted in an organ bath for recording isometric tension. The experiments followed a multiple curve design. Contractions of RA were provoked by phenylephrine or by KCl (100 mM).

Results: Resveratrol relaxed RA of normal rats more potently than RA of rats with diabetes (EC_{50} were 8 and 40 μM, respectively). L-NAME and methylene blue partly antagonized the relaxation of RA of normal animals only. A selective blocker of ATP-sensitive potassium (K_{ATP}) channels, glibenclamide, and non-selective and highly selective blockers of BK_{Ca} channels, tetraethylamonium and iberiotoxin, did not affect the effects of resveratrol in both experimental models. High concentration of resveratrol (100 μM) completely inhibited KCl-induced contractions of RA in both experimental models.

Discussion: In conclusion, we have shown that resveratrol induces a strong endothelium-dependent relaxation of RA of normal rats. In diabetic rats, resveratrol induced NO-independent relaxation of RA. These observations indicate that the early stage of insulin-dependent diabetes mellitus is associated with a functional defect of the endothelium of RA. K_{ATP} and BK_{Ca} channels are not involved in resveratrol-induced relaxations of RA. It seems that the effects of resveratrol on RA of diabetic rats involves mechanisms independent of endothelium, K_{ATP} and BK_{Ca} channels. We need further investigations to evaluate this mechanism.

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