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MEETING ABSTRACT

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**Resveratrol wine polyphenol relaxes rat renal artery in diabetic rats: the role of smooth muscle voltage-sensitive potassium channels**

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**Background:** A polyphenol present in red wine, resveratrol, is thought to be responsible for cardiovascular benefits associated with moderate wine consumption. Recently it has been documented that resveratrol reduced hyperglycemia and improved metabolic parameters in animal models of diabetes. Over the past 10 years, we have reported potent effects of resveratrol in preventing contractions of different rat and human blood vessels. However, the effect of resveratrol on vasculature of diabetic animal is not defined. Thus, the aim of this study was to investigate the mechanisms of resveratrol-induced vasorelaxation of the renal artery (RA) of diabetic rats.

**Methods:** Diabetes in male Wistar rats was induced by alloxan. Rings of RA were mounted in an organ bath for recording isometric tension. Contractions of RA were provoked by phenylephrine. The experiments followed a multiple curve design. Expression of different voltage-sensitive potassium (K<sub>v</sub>1.1, 1.2., 2.1 and 4.2) channels in the vascular wall of RA was evaluated by immunohistochemistry.

**Results:** Resveratrol relaxed RA of normal rats more potently than RA of rats with diabetes (*EC*<sub>50</sub> were 8 and 50 μM, respectively). A nonselective blocker of K<sub>v</sub> channels, 4-aminopyridine, partly inhibited the relaxation of RA of normal as well as of diabetic rats. However, margatoxin, a selective antagonist of K<sub>v</sub>1.x channels, completely antagonized the relaxation of RA of diabetic rats only. In contrast, a selective antagonist of K<sub>v</sub>4.2 channels, phrixotoxin antagonized the effect of resveratrol on the RA of normal rats only. The vascular wall of RA of diabetic and non-diabetic rats showed variable positivity with applied antibodies. RA of normal rats expressed K<sub>v</sub>1.2, K<sub>v</sub>1.3 and K<sub>v</sub>4.2 channels; the RA of diabetic rat expressed K<sub>v</sub>1.1 and K<sub>v</sub>1.2, but not K<sub>v</sub>4.2 channels. The K<sub>v</sub>2.1 channels are expressed neither in RA of diabetic nor in RA of normal rats.

**Discussion:** In conclusion, we have shown that resveratrol induces a stronger relaxation of RA of normal rats than diabetic rats. It seems that resveratrol induces relaxation of RA by activation of smooth muscle K<sub>v</sub>4.2 channels in normal rats and K<sub>v</sub>1.x channels in diabetic rats.

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