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Vasorelaxant Effects of Ginseng and Role of Endothelium

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The vascular endothelium can affect the responsiveness of the underlying smooth muscle by releasing endothelium-derived relaxaing factors when exposed to a variety of neurohormonal mediators, and it was reported that endothelium-dependent relaxations to acetylcholine are reduced in the aorta of hypertensive rats or hypercholesteremic rabbits. It has been reported that Ginseng has an antihypertensive or antihypercholesteremic effects by numerous investigators, but their effects and their exact mechanisms of action are still uncertain. The studies were performed to determine whether or not Ginseng releases the releasing factor from the endothelium of rat aorta. When rat aortic rings were exposed to increasing concentrations of red Ginseng saponin, relaxation was observed in dose-dependent manner in the aortic rings with endothelium, not without endothelium. This vascular relaxation was inhibited by L-NMMA, EDRF inhibitor and by methylene blue, guanylate cyclase inhibitor, suggesting that the vasorelaxation evoked by Ginseng saponin is due to the release of endothelium-dependent relaxing factor (EDRF) from vascular endothelium. In hypercholesteremic rabbits, fed with cholesterol, relaxation of aortic rings were impaired with acetylcholine. The impaired relaxations were improved by concurrent administration of Ginseng saponin or Ginseng petroleum ether fractions, suggesting that Ginseng component may prevent the development of atherosclerosis. The investigation shows that Red Ginseng relaxes the aortic rings isolated from rats and the relaxation is due to the release of endothelium-derived relaxing factor. This study also demonstrates that dietary supplementation with Red Gineng components improves endothelum-dependent responses in hypercholesteremic rabbits. Therefore, Red Ginseng can be applicable to decrease the blood pressure and dietary treatment with Red Ginseng may ameliorate or protect endothelial function and thus delay the process of atherosclerosis.