

Young rats given polyphenols show less endothelial function deterioration with aging

January 31 2011

The endothelium is the inner lining of our blood vessels and normal functions of endothelial cells include enabling coagulation, platelet adhesion and immune function. Endothelial dysfunction is associated with reduced anticoagulant properties and the inability of arteries and arterioles to dilate fully.

The gradual decrease in endothelial function over time is a key factor in the development of diseases associated with ageing, especially cardiovascular disease (CVD). Many epidemiologic studies suggest protection against CVD from moderate intake of [alcoholic beverages](#), especially those rich in antioxidants, such as [red wine](#), which is high in polyphenols (RWPs).

This study examined whether intake of red wine polyphenols (RWPs), a rich source of natural antioxidants, prevents ageing-related impairment of vascular function and physical exercise capacity. Vascular reactivity from 12, 20 and 40 week-old [rats](#) was assessed in organ chambers. Rats received from week 16 to 40 either solvent, RWPs or the antioxidant and NADPH oxidase inhibitor, apocynin. RWPs and apocynin improved the endothelial dysfunction, normalized oxidative stress and the expression of the different proteins. RWPs also improved ageing-related decline in physical exercise. Thus, intake of RWPs protects against ageing-induced endothelial dysfunction and decline in [physical performance](#). These effects likely involve the ability of RWPs to normalize oxidative stress and the expression of proteins involved in the formation of NO and the angiotensin II pathway.

International Scientific Forum on Alcohol Research members thought that this was an excellent paper, as it begins to delve into mechanisms by which polyphenols improve health. A mechanism is addressed and results are consistent with the working hypothesis of a specific interaction between polyphenols and peculiar enzymes. There is a satisfying agreement between basic mechanisms and pathophysiology. Some scientists believe that interventions to improve endothelial function (such as the consumption of red wine or other sources of polyphenols) should begin earlier in life to slow down the endothelial dysfunction that occurs with ageing. This study in rats tends to support such a belief.

The present study in rats found that the administration of red wine [polyphenols](#) protected against ageing-induced endothelial dysfunction. As stated by the authors: "The present findings indicate that regular intake of RWPs in the drinking water starting at young age (16 week-old) prevented the ageing-related endothelial dysfunction most likely by reducing the excessive oxidative stress in the arterial wall." They suggest an important role of NADPH oxidase and possibly also the angiotensin system in the abnormal vascular response in ageing. Their study showed that, "RWPs intake had also a physiological beneficial effect since it improved the [physical exercise](#) capacity of old rats."

More information: Dal-Ros S, Zoll J, Lang AL, Auger C, Keller N, Bronner C, Geny B, Schini-Kerth VB. Chronic intake of red wine polyphenols by young rats prevents ageing-induced endothelial dysfunction and decline in physical performance: Role of NADPH oxidase. *Biochem Biophys Res Commun* 2011;404:743-749.

Provided by Boston University Medical Center

Citation: Young rats given polyphenols show less endothelial function deterioration with aging (2011, January 31) retrieved 20 March 2024 from <https://phys.org/news/2011-01-young-rats-polyphenols-endothelial-function.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.