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Abstract

Protective Effects of Dietary Polyphenols on Arterial Stiffness †

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Abstract: Cardiovascular diseases are the major cause of mortality, with 17.9 million deaths/year worldwide and 3.9 million deaths/year in Europe, representing a cost to the EU economy of €210 billion/year [1,2]. Arterial stiffness has been shown to increase cardiovascular morbidity and mortality [3,4]. It is a complex phenomenon characterized by decreased vascular distensibility [5]. This degenerative process is influenced by ageing and several risk factors but is mainly associated with changes in the extracellular components of elastic arteries [5,6]. Several factors, including vascular function, oxidative stress, inflammation, glycation and autophagy contribute to the pathophysiology of arterial stiffness. Considering that the structural degeneration of the extracellular matrix of the vascular wall is practically irreversible with current therapies, it is extremely important to evaluate the impact of preventive interventions, for example reducing the impact of aging on increasing stiffness [5]. Most cardiovascular diseases can be prevented by addressing behavioral risk factors, of which dietary factors make the largest contribution [2]. Polyphenols are a widespread class of plant secondary metabolites that are found in several foods and possess a diverse range of biological activities. Dietary polyphenols display pleiotropic effects, interacting with most mechanisms involved in arterial stiffness etiology. Therefore, they could constitute an interesting option to target vascular stiffening. In vivo activity of polyphenols or polyphenol containing foods is known [7]. For several polyphenols or polyphenol containing foods, including cocoa, grapes, berries and olive, intervention studies point to a beneficial effect on vascular stiffness [8–12]. With regard to olive polyphenols specifically, our previous intervention study has shown blood pressure lowering effects [12–15]. In order to further elucidate mechanisms of action, we recently focused on specific studies investigating the potency of olive polyphenols as autophagy-inducing compounds, and the contribution of this mechanism to their atheroprotective effects.

Keywords: arterial stiffness; dietary polyphenols; olive polyphenols; autophagy

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