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LETTER TO THE EDITOR

Anti-oxidant therapy in non-alcoholic fatty liver disease: the role of silymarin

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To the editor,

We have read with a great interest the recent review by Scorletti et al. [1] on the pathogenesis of non-alcoholic fatty liver disease (NAFLD), on the relationship between NAFLD and cardiovascular disease (CVD), and on the treatment options. Reactive oxygen species (ROS), including the superoxide radical, hydroxyl radical, hydrogen peroxide, and lipid peroxide radicals have been involved in the pathogenesis of NAFLD [2]. The mechanism of free radical damage, including ROS-induced peroxidation of the polyunsaturated fatty acid in the bilayer cell membrane, which caused the chain reaction of lipid peroxidation, thus damaging the cellular membrane and causing further oxidation of membrane, lipids, and proteins. It has been reported that NAFLD is an independent risk factor for death from CVD. The precise mechanisms involved in this association are unclear. However, it has been reported in the literature that oxidative stress may be the key link between NAFLD and CVD [2]. *Silybum marianum*, commonly known as Milk Thistle (MT), family: *Asteraceae/Compositae*, is one of the oldest and thoroughly researched plants in the treatment of liver diseases [3]. MT has been used since the time of ancient physicians and herbalists to treat a range of liver and gallbladder disorders, and to protect the liver against poisoning from chemical and environmental toxins.

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The active complex of MT is a lipophilic extract from the seeds of the plant and is composed of four isomer flavonolignans, collectively known as silymarin. Silymarin is reported to have a very good safety profile. Several pharmacological studies, in experimental animals and in humans, have been carried out on silymarin and silibinin its predominant and most active components. It has been found that these substances exert hepato-protective, anti-oxidant, anti-inflammatory, and anti-fibrotic properties. In type 2 diabetic patients, the elevation of glucose and free fatty acid levels leads to the generation of ROS, insulin resistance, β-cell dysfunction, and subsequently impaired insulin secretion. Silymarin, with its anti-oxidant properties, is active against oxidative stress and may induce a positive effect on metabolic abnormalities and in particular to treat NAFLD [4]. In addition, insulin resistance of type 2 diabetes is closely associated with the presence of a high cardiovascular risk [1, 5]. Some data have reported that MT possesses an anti-atherosclerotic activity, with improvement of endothelial dysfunction in diabetic obese mice [2]. We conclude that a multifaceted approach to the mechanisms underlying ROS-related damage in the patients with insulin resistance, is probably in the years to come. In this way, cardiovascular and metabolic properties of MT are of the potential clinical interest for its given favorable safety profile.

Competing interests The authors declare that they have no competing interests.

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