Resveratrol-based Nutraceuticals for the Management of Diabetes and Obesity: Real Therapeutic Potential or a mere Palliative?

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Editorial

It is well known that obesity and diabetes (more specifically, the type 2 diabetes mellitus, T2DM) are currently a growing public health problem, which involves several millions subjects in the World. Years ago, indeed, the term “diabesity” was coined highlighting not only the strong pathogenic relationship between obesity and T2DM, but also the pandemic aspect that link these two diseases. The increasing global prevalence of diabesity represents a grave concern in terms of public health and, at the same time, medical costs, resulting in a serious social economic issue.

Periodically, several scientific societies elaborate guidelines for the management of obesity and T2DM, mainly based on a particular interest in life-style and nutrition, as a useful strategy for prevention and treatment. In addition to the life-style intervention, a large number of drugs are currently available, and some of them (e.g. metformin or incretine-mimetic) are used both in case of diabetes and/or obesity. These pharmacological treatments, however, are not without side-effects. For this reason, the interest in natural drugs is nowadays emerging.

Beside the well-known phytherapy, based on the use of medical herbs with documented beneficial effects on human health, a consolidated and growing interest is currently in nutraceutical. This term is a crasis between the words “nutrition” and “pharmaceutical”, coined in the 1989 by Dr. S. De Felice. Nutraceutical, thus, is the science studying chemical, composition and medical effects of the food- or animal-derived bioactive compounds, underling the strong influence of the diet on health. Nutraceutical, indeed, is currently recognized to be one the most important natural approach for management (mainly as add-on therapy to the common treatments) and the prevention of several pathologies, acting “beyond diet, before drugs” as stated in 2012 by Prof. E. Novellino [1].

Nowadays a large number of evidence-based data regarding the effects of single or group of food-derived bioactive compounds are available in scientific literature, pointing out the interest of scientific research in nutraceuticals. In particular, several in vitro, animal-based and in vivo studies were carried out demonstrating the effects of nutraceutical in managing obesity and/or diabetes. As an example, we demonstrated that polyphenols from white tea exhibited a strong activity in reducing glucose uptake in HepG2 cell lines [2]. Moreover, it was proposed a possible anti-diabetic or anti-obesity effect of the bitter compounds contained in beer, which may act stimulating the intestinal bitter taste receptors, resulting in increasing the incretine release [3], but further investigation are needed.

Beside this evidence, in this document we would like to focus your attention to the role of resveratrol (RSV) on diabesity. RSV is the most representative polyphenol contained in skin of grapes and wine. Several beneficial effects are attributed to RSV and, among these, the well- and historically-known cardio protection. Interestingly, RSV has been reported to exert anti-diabetic and anti-obesity effects [4]. Although it has not been too much stressed, studies demonstrated an important mechanism of action by which RSV can act in prevention and management of diabesity: the activation of the 5’ AMP-activated protein kinase (AMPK) [5-8], a Ser-Thr kinase strongly involved in regulation of cellular and glucose metabolism [9], target of anti-diabetic drugs, such as metformin [10,11]. This AMPK activation is the main target for the RSV metabolic effect [12], resulting in

a) Stimulating the glucose uptake in L6 myotubes [13,14]

b) Inhibiting adipocyte differentiation [14]

c) Improving glucose homeostasis and symptoms in animal
model of gestational diabetes [15]

d) Promoting formation of brown adipocytes and exerting thermogenic effects [16]

With this editorial, we would like to propose a start point for discussion and an input for further investigations about the role of RSV-based nutraceuticals, which have been shown to be not a mere palliative but a novel and promising natural approach for the management of diabesity. We hope this Journal will encourage the scientific discussion regarding the role of nutraceutical sciences in metabolic diseases focusing on the evidences, safety and absence of side-effects, enlarging the knowledge of physician on this issue.

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