



Polyphenols, Mediterranean diet, and colon cancer

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Dear Editor,

We have read with great interest the manuscript “Risk factors affecting hospital stay among patients undergoing colon cancer surgery: a prospective cohort study.” by Orive M and coworkers [1] and we found it very important with a view to clinical prevention. The article aimed to identify and validate risk factors that contribute to prolonged length of hospital stay (LOS) in a prospective cohort study that included 1955 patients undergoing resection for colorectal cancer. They found that some of the strongest independent predictors of prolonged LOS, such as surgical infections or open surgery, could be modified to reduce LOS and, in turn, other adverse outcomes.

With reference to the findings reported in the paper, we would like to make the following contribution to the discussion. Lifestyle and nutrition strongly influence the development and outcome of colon cancer [2].

In a recent paper, we analyzed 3 components of the Mediterranean diet that seems to be associated with reduction of colon cancer [3]. We analyzed the effects of olive oil (polyphenols), red grapes (resveratrol), and tomatoes (lycopene). The most active component in term of prevention is olive oil that exerts a protective effect in reducing risk for CRC and other types of cancer, including prostatic cancer. Olive oil acts

on polyamine metabolism in cells, leading to a reduction in carcinogenesis progression [4].

The Mediterranean diet is characterized by high intake of olive oil, a source of polyphenols [5, 6]. It is well known that these antioxidants prevent the development of atherosclerosis both in men and in women and prevent the onset of atrial fibrillation [7, 8]. In addition, resveratrol, a polyphenol from grapes and wine, has many pharmacologic properties, such as the reduction of platelet aggregation and eicosanoid synthesis. It promotes protection against damage from reactive oxygen species and from inflammation, resulting in cardiovascular protective benefits and, certainly, anticancer activities [2, 3]. Because resveratrol is a naturally occurring compound, it has been highly studied for the prevention and treatment of many diseases including cancer. Numerous *in vitro* studies have shown that resveratrol has multiple anticancer effects, protecting against both tumor initiation and cancer progression pathways. Resveratrol promotes cell cycle arrest leading to apoptosis of tumor cells, prevents tumor-derived nitric oxide synthase expression to block tumor growth and migration, and acts as an antioxidant to prevent DNA damage that can lead to cancer formation [9]. However, clinical evidence for resveratrol as an effective supplement for cancer prevention and treatment is scarce. In our review of the literature, we concluded that the beneficial effects of Mediterranean diet belong to the synergistic effects of several components more than to the effect of a single food [3, 7].

Among the healthy dietary patterns, the MedDiet emerges in terms of beneficial properties associated with longevity. Current evidence highlights the protective effect exerted by MedD on the different components of MetS. Interestingly, the effect exerted by polyphenols contained within the representative MedD components (i.e., olive oil, red wine, and coffee) seems to be accountable for the beneficial properties associated to this dietary pattern [10]. Anti-inflammatory diets contain mainly fiber, polyunsaturated fatty acids, minerals, vitamins, anthocyanidins, isoflavones, and b-carotene. However, the

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inflammatory potential of most food items remains unclear and needs to be thoroughly examined [3]. With reference to hospital stay, it is possible that other than technical features also lifestyle influences the outcome of patients. A good approach to better nutrition could help in preventing colon cancer and in reducing surgical times. In addition, a good intake of antioxidants reduces inflammation and improves immune responses and the outcome of infection [11]. Inflammation is the first biological response of the immune system to infection. Evidence suggests that the anti-inflammatory effect is mediated through the regulation of various inflammatory cytokines as well as non-cytokine mediators [12]. Fruits, vegetables, and food legumes contain high levels of phytochemicals that show anti-inflammatory effect [13]. On the contrary, malnourished patients are a population with documented longer length of stay, higher costs, and in-hospital complications [14]. A multidisciplinary team approach intervention on 400 malnourished patients at John Hopkins leads to a reduction in implementation delays and decreased LOS of 1.9 days [15]. In a subset with severe malnutrition, the intervention decreased length of stay by 3.2 days [15].

The relationships between diet and clinical outcomes of cancer patients need to be evaluated directly, and more such studies are urgently needed.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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