

EDITORIAL



Clinical Studies

Editorial: Exploiting the effect of dietary fibre on the gut microbiota in patients with pelvic radiotherapy

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Even though the literature shows limited data regarding the epidemiological studies on dietary fibres in malignancies reduction, these nutritional components proved their efficacy in modulating general health status, reducing abdominal disease-associated symptoms, diminishing the inflammation connected with cancerous pathologies, and in health recovery after pelvic cancer radiotherapy.

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Lately, the modulation of gut microbiota through the intake of dietary fibres has gained attention, especially in elder people suffering from various metabolic-associated illnesses, including several oncogenic disorders among which pelvic cancers can be identified. Based on the review paper of Eaton and collaborators [1], strong evidence support that dietary fibres exert a positive effect on the recovery of the gut microbiota after pelvic radiotherapy [1, 2].

As the incidence of abdominal and pelvic malignancies represents a major public health problem, treatment based on surgical removal of tumours and organ preservation by using radiotherapy are the most used procedures for the affected patients. In this context, the gut microbiota gets very much affected by the side effects of the radiotherapy, therefore is a crucial need for alternative approaches to diminish the adjacent effects of the treatment and to improve its results, both in terms of increasing the tumour control and in reducing the toxicity [3, 4].

The intestinal community of microorganisms interacts with cancer therapy, as it is directly responsible for the absorption of nutrients, for the immune system response, and at the same time for the life quality of the hosts [1, 5]. The use of pre- and probiotics for the recovery of intestinal equilibrium after invasive or minimal-invasive treatments of diverse illnesses has attracted great interest [6, 7]. To date, studies on dietary fibre intake have been reported to exert anti-cancerous, anti-oxidant, anti-allergic, anti-inflammatory and anti-microbial effects, especially when it comes to the category of polyphenolic compounds [2, 4, 8]. Such valuable products can be taken from fresh vegetable products and from different cereals, but they can be also identified in waste fractions deriving from these products' processing [2, 9]. On the other hand, in the treatment of pelvic cancers such as endometrial, cervical, colon, rectal, or prostate cancer is recommended to follow a fibre-based diet before and during pelvic radiotherapy, usually because of the anti-diarrheal effect of most of the water-soluble fibres [6, 10].

The beneficial potential of dietary fibres that serve as a nutrient substrate for the probiotic strains, is associated with the production of short-chain fatty acids (SCFAs) by the commensal

bacterial community in the large intestine [5]. SCFAs like acetate, propionate and butyrate have a positive impact on DNA repair, the suppression of cancerous organoids proliferation, and on reducing acute and chronic inflammation. Last but not least, SCFAs promote the expression of anti-inflammatory cytokines such as Interleukins (IL-10) and promote the inhibition of proinflammatory cytokine IL-6 and tumour necrosis factor (TNF α) production that are linked with tumorigenesis [3]. In addition, intestinal dysbiosis induced by radiotherapy in pelvic cancer treatment is closely connected with diminished levels of SCFAs, and with the altered probiotic microbial community in the colon [7]. Therefore, the use of prebiotics and probiotics in both the prevention and in reducing the toxicity following tumour treatment represents one of the most accessible and non-invasive methods to reduce the incidence of pelvic cancer evolution [1, 4].

Usually, chemo- and radiotherapy induce gut microbial dysbiosis that is characterised by an abnormal ratio between pathogenic microbes and beneficial ones. The intestinal overload with pathogenic strains is also associated with the increased rate of intestinal inflammation, a major trigger in carcinogenesis [3, 5]. Anyhow, dietary fibres proved their efficacy in maintaining intestinal homeostasis and the general health state implicitly, because of their attribute to feed the probiotic bacteria. Still, more clinical research is required considering the dietary fibres manipulation in connection with the occurrence, evolution, and treatments together with their side effects in terms of pelvic malignancies. Moreover, the modulation of the gut community of people with altered gut microbiota as a result of chemo- and radiotherapy by means of dietary fibre intake also need more investigation, especially in the elderly whose microbiota is less favourable than that found in young patients. At long last, more clinical work must be done in investigating the production of SCFAs from a dietary fibre-based diet in patients recovering after radiotherapy induced by pelvic cancers.

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