



Hereditary, environmental, and dietary risk factors of colorectal cancer: a case-control study in the Algerian East

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Abstract

Colorectal carcinoma (CRC) is the second most common cancer diagnosed in Algeria. The incidence and the mortality rate of CRC have increased so that the nation now ranks third in Africa in both these variables. Many environmental and genetic factors are suspected to play an important role in the development of the disease. This study aimed to identify the risk factors for CRC in Algeria. We performed a case-control study in five Medical Oncology Services in this region: Tebessa, Batna, Annaba, Setif, and Constantine, from 2016 to 2019. Altogether, 200 patients diagnosed with CRC and 200 age-matched controls without any diagnosis of cancer were included. Study participants were interviewed about environmental, dietary, and hereditary risk factors, i.e., family history of cancer, using a questionnaire. Results showed a significant association between high educational level and a decreased risk of CRC. Diagnoses of any cancer or of CRC in first-degree or in second- or third-degree relatives also were significantly associated with CRC risk. Occupational exposures showed a significant link with an increased risk of CRC, as did obesity, alcohol consumption, and passive smoking. Yogurt, cereals, sugar, butter, and margarine consumption were significant protective factors, while cheese, dried fruits, red meat, juice, and fizzy drink consumption was associated with increased risk. Our findings suggest a benefit of public health campaigns to enhance awareness about CRC and to encourage healthy dietary choices and avoidance of non-dietary risk factors.

Keywords Colorectal cancer · Risk factors · Hereditary · Environment · Occupational · Diet · Algerian East

Introduction

As the world's second deadliest and third most commonly diagnosed malignancy, with an estimated 1,849,518 new cases and 880,792 deaths in 2018 alone, colorectal cancer (CRC) has an important impact on the global cancer burden, (IARC 2019).

However, CRC rate and mortality vary over tenfold among European and African countries (Wong et al. 2019).

In the Mediterranean countries, 192,232 new cases and 89,095 deaths were estimated to have occurred in 2018, with CRC ranking third in terms of incidence and second in mortality among cancers. According to GLOBOCAN 2018 data, the mortality and the incidence of CRC in Mediterranean countries are higher than that in the USA and Canada combined (Ferlay et al. 2018).

Algeria is the largest country in size in Africa and among the Mediterranean countries. It has a population of more than 43 million people (ONS 2018). In 2014, CRC incidence was about 4800 new cases (Hamdi Cherif et al. 2015). In 2018, CRC rates ranked Algeria in the first place among North African countries, with about 3000 deaths and more than 5500 new cases. Nonetheless, the incidence of CRC in Algeria is lower than that of many Mediterranean countries in Southern Europe (Ferlay et al. 2018).

CRC emerges from epithelial cells of the colon or rectum. When certain cells acquire genetic or epigenetic mutation, cancer arises (Ewing et al. 2014). Environmental and genetic

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