Original article

Effect of dairy products intake on breast cancer risk: A case-control study in Algeria

Effet de la consommation de produits laitiers sur le risque de développer un cancer du sein : étude cas-témoin en Algérie

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Abstract

Objectives. – The aim of this hospital-based case-control study is to evaluate the association between dairy products consumption and breast cancer risk. This relationship has not previously been studied in Algeria.

Materials and methods. – Our study was conducted on 184 breast cancer patients and equal number of age-matched controls. Data on sociodemographic characteristics, reproductive and menstrual history, medical history, lifestyle factors and anthropometric measurements were collected by interviewers. Dietary intake information was also obtained using a short food questionnaire. The Odds ratios [95% confidence interval (CI)] of breast cancer were estimated across categories of dairy intake using multivariable logistic regression.

Results. – We observed an increased breast cancer risk in women with higher consumption of milk [OR = 2.61, 95% CI: 1.32–5.16, $P = 0.027$] comparing with those in lower category of intake. An inverse association with breast cancer risk was observed for total cheese intake when comparing highest with lowest quartiles. The protective effect of cheese was confirmed only for fresh cheese. No significant association was found for other types of dairy foods.

Conclusion. – Our study demonstrates the differential effect of dairy products types on breast cancer risk. Future studies are warranted to confirm these results.

Résumé

Objectifs. – Le but de cette étude cas-témoin était d'évaluer l'association entre la consommation de produits laitiers et le risque de développer un cancer du sein. Cette association n'a pas été étudiée auparavant en Algérie.

Matériels et méthodes. – Notre étude a été menée sur 184 patientes atteintes d'un cancer du sein et un nombre égal de témoins appariés aux cas selon l'âge. Les données sur les caractéristiques sociodémographiques, l'histoire menstruelle, les antécédents médicaux, les antécédents familiaux, les facteurs liés au mode de vie, les mesures anthropométriques ainsi que les informations concernant l'apport alimentaire ont été recueillies par les intervieweurs. Les *odd-ratios* (intervalle de confiance à 95 % [IC]) du cancer du sein ont été estimés pour toutes les catégories de consommation de produits laitiers en utilisant une régression logistique multivariée.

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Résultats. – Nous avons observé un risque accru de cancer du sein chez les femmes ayant une consommation élevée de lait (OR = 2,61, IC 95 % : 1,32–5,16, p = 0,027) par rapport à celles appartenant à la catégorie inférieure de consommation. Une association inverse avec le risque de cancer du sein a été observée pour la consommation totale de fromage lorsqu'on compare le quatrième au premier quartile. L'effet protecteur du fromage n'a été confirmé que pour le fromage frais. Aucune association significative n'a été observée avec les autres types de produits laitiers.

Conclusion. – Notre étude démontre l'effet différentiel des types de produits laitiers sur le risque de développer un cancer du sein. De futures études sont nécessaires pour confirmer ces résultats.

1. Introduction

Breast cancer is by far the most frequent malignant neoplasic disease in the world among women with an estimated 1.67 million new cancer cases diagnosed in 2012 [1]. Algeria has one of the highest incidences in Africa, with an age-standardized rate of 48.5 cases per 100,000 [1]. This incidence is even higher in large cities like Algiers, where it is patently increasing [2].

There is some evidence that several factors can affect the risk of developing breast cancer, among them: genetic, reproductive, and environmental variables [3]. Given the influence it may have [4], diet is one of the most studied and most important lifestyle factors which may be linked to breast cancer risk. However, in Algeria no study has measured the implication of this factor on the disease and data are still awaited; especially that as in other countries of the Mediterranean basin, eating habits of the Algerian population tend to become Westernized [5], and these changes could have an impact on the health of individuals.

One of the essential food groups of Algerian diet is dairy products. Effectively, a long tradition in the consumption of fermented dairy products [6], a significant increase in milk intake in recent decades [7], as well as the recent development and diversification of the dairy industry [6], confer to this food group a prominent place.

Dairy products represent an important component of diet and they are cited in most food recommendations guidelines [8,9]. Furthermore, this food group represents a rich source of nutrients as Calcium, Vitamin D, conjugated linoleic acid, butyrate, lactoferrin and bioactive peptides, which can prevent breast cancer [10]. But some other compounds may have the opposite effect, as saturated fatty acids, Insulin like growth factor-I, estrogens and some of exogenous elements such as pesticides [10].

The available data obtained from epidemiologic studies over the past three decades do not provide consistent and similar results. A recent meta-analysis of 22 prospective cohort studies and five case control studies indicates that dairy consumption was inversely associated with risk of developing breast cancer (Relative risk = 0.90, 95% confidence interval [CI], 0.83–0.98), but results were more significant in premenopausal than in postmenopausal women [11]; as it was confirmed in the World Cancer Research Fund report on nutrition and breast cancer [12]. However, doubt still persists because of some studies, as it has been shown in a large Swedish cohort study, people with lactose intolerance, characterized by low consumption of milk and other dairy products, had decreased risk of breast cancer, but the decreased risk was not found in their family members, which suppose that this food group is involved in the development of breast cancer [13].

More studies are needed to clarify the association between dairy products intake and breast cancer risk. We have therefore conducted the present analysis to evaluate this association through a hospital-based case-control study among Algerian women.

2. Subjects and methods

2.1. Study population

This study comprised 184 histologically confirmed breast cancer cases from 195 consecutive eligible patients, enrolled from January 2015 to April 2017 in the Oncology center of Rouiba hospital (Algiers) and Senology department of Pierre and Marie Curie Center located in Mustapha Pacha hospital (Algiers). At the same time, one hundred and eighty four age-matched (5 yr intervals) controls referred to other sectors were recruited from the same hospitals: Pneumo-phtisiology and surgery centers of Rouiba Hospital, but also in Gastrology, Periodontology and orthopedics centers of Mustapha Pacha hospital.

Participants included female subjects aged from 25 to 80 years. To be eligible, cases and controls should not have a history of any cancer, or a chronic illness affecting their nutritional status. In addition, pregnant women, nursing mothers or special diets were excluded. Only participants living in Algiers province and neighbouring provinces (Boumerdes, Blida, Bouira, Tipaza, TiziOuzou) were included, in order to have a homogeneous population. Breast cancer for cases and illnesses affecting controls must have been diagnosed within the last 6 months. Permissions were obtained from ethics committees of selected hospitals and a written consent was given from all participants prior the interview.

2.2. Data collection

A face to face interview using a precise and concise questionnaire allowed collecting data on potential risk factors, including: sociodemographic characteristics (age, marital status, educational level and occupation), reproductive and menstrual history