

Review Article

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Effect of estrogen hormones present in animal milk, dairy products and animal proteins in cancer: A mini review

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Abstract

Cancers are the one of most leading cause of deaths, among both women and men. Breast cancer is the malignancy most frequently diagnosed in women. It is also the most common cause of cancer deaths among women. Even though the etiology of most cases of cancers is not known, risk factors include a variety of nutritional factors. Increased levels of estrogens metabolites are supposed to be related with cancers of the reproductive system. Potential dietary source of these metabolites that is usually consumed worldwide is milk.

Keywords: Cancer, Estrogen hormones, Animal proteins, Dairy products, Meat.

Introduction

Dairy cows are the most common source of milk; however, goats are the primary source of milk worldwide. The absolute concentrations of unconjugated and total (unconjugated plus conjugated) estrone (E1) and 17 β -estradiol (E2) were compared in a variety of commercial cow milks (regular and organic) and goat milk. A lower combined concentration of E1 and E2 was found in goat milk than in any of the cow milk products tested. The differences in E1 and E2 levels between regular and organic cow milks were not as significant as the differences between goat milk and any of the cow milk products. Goat milk represents a better dietary choice for individuals concerned with limiting their estrogen intake.¹ Some studied expressed concern about estrogens in food because of their potential to promote growth of estrogen-sensitive human cancer cells. The concentrations of estrogen in milk, estrogen associates with the fat phase of milk, the analysis of whole milk is an important consideration. Therefore, were to quantify 17- β -estradiol (E2) in whole milk from dairy cows and to determine whether E2 concentrations in milk from cows in the second half of pregnancy were greater than that in milk from cows in the first half of pregnancy or in nonpregnant cows.² Ovary cancer risk in relation to consumption of dairy products was investigated on dietary habits and other risk factors for cancer, which was completed by postmenopausal women. No association was seen between consumption of milk, yoghurt, cheese or fermented dairy products and ovarian cancer risk. The multivariable adjusted relative risk of epithelial ovarian cancer for women in the highest compared to the lowest quintile of intake of lactose or dairy fat. Lactose or dairy fat intakes were not associated with serous ovarian cancer risk. Results do not support a connection between consumption of dairy products or lactose intake and ovarian cancer.³ Milk fat globule membrane (MFGM) is a biopolymer composed primarily of membrane

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proteins and lipids that surround the fat globules in milk. It is considered to have potential as a bioactive ingredient having potential benefits. The dietary MFGM confers protection against colon cancer compared to diets containing anhydrous milk fat (AMF). The dietary sphingolipids are protective against colon cancer yet extend this finding to MFGM, a milk fat fraction available as a food ingredient.⁴ Chronic lymphocytic leukaemia (CLL) results from the accumulation of malignant immunologically incompetent lymphocytes. A routine full blood count of a single patient revealed that he had CLL. The daily intake of 700 ml of fresh bovine milk resulted in a decrease in the lymphocyte count over a period of 5 years. The constituent(s) in milk would be responsible for the decline of the lymphocyte count. It was found that the higher vitamin D constituent in the milk, the lower the lymphocyte count. Even as the milk from large dairy farms which use supplements in the feed in order to increase milk production, considerably decreased the lymphocyte count, the milk from small dairy farms, which do not supplement, had hardly any effect.⁵ The continued increase in incidence of some hormone-related cancers worldwide is of great concern. Although estrogen-like substances in the environment were blamed for this increase, the possible role of endogenous estrogens from food particularly concerned about cows' milk, which contains a considerable quantity of estrogens. When we name cows' milk as one of the important routes of human exposure to estrogens, "man has been drinking cows' milk for around 2000 years without apparent harm." However, the milk that we are now consuming is quite different from that consumed 100 years ago. Unlike their pasture-fed counterparts of 100 years ago, modern dairy cows are usually pregnant and continue to lactate during the latter half of pregnancy, when the concentration of estrogens in blood, and hence in milk, increases. The correlation of incidence and mortality rates with environmental variables in worldwide countries provides useful clues to the etiology of cancer. The correlated incidence rates for breast, ovarian, and corpus uteri cancers with food intake. Meat was most closely correlated with the breast cancer incidence, followed by milk and cheese. Meat is a factor contributing most greatly to the incidence of breast cancer. Milk was most closely correlated with the incidence of ovarian cancer, followed by animal fats and cheese. Milk plus cheese make the greatest contribution to the incidence of ovarian cancer. Milk was most closely correlated with corpus uteri cancer, followed by cheese. Milk plus cheese make the most significant contribution to the incidence of corpus uteri cancer. The increased consumption of animal-derived food

may have adverse effects on the development of hormone-dependent cancers. Among dietary risk factors, we are most concerned with milk and dairy products, because the milk we drink today is produced from pregnant cows, in which estrogen and progesterone levels are markedly elevated.⁶ The associations between animal protein or fat and risk of pancreatic cancer have been reported. When comparing highest versus lowest levels of intake in multivariable adjusted models, positive associations were observed for several beef/lamb and individual animal protein items, including beef/lamb as a main dish, regular hamburger, whole eggs, butter, and total dairy not including butter. Some high-fat/processed-meat products, but not all (beef, pork, or poultry hot dogs), also were positively associated with risk. An inverse association was noted for greater chicken/turkey consumption. The risk comparing the highest versus lowest quartiles for fats and cholesterol consumption were: total fat; animal fat; saturated fat; monounsaturated fat; and dietary cholesterol. The evidence showed that beef or lamb, eggs, dairy, fat, or cholesterol may increase the risk of pancreatic cancer.⁷

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