Vitamin C and iron intakes and breast carcinogenesis: case-control study

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The effect of antioxidant and pro-oxidant micronutrients on the development of breast cancer (BC) remains to be established. This case-control study aimed to determine the relationship between the dietary intakes of vitamin C (antioxidant) and iron (oxidant) and breast carcinogenesis. Women (n=105) were recruited from a large hospital in New Brunswick, Canada, and divided into three groups following a mammography: control group (n=67 women without diagnosed BC), benign group (n=18 women recently diagnosed with a benign breast tumor), and malignant group (n=20 women recently diagnosed with BC). The groups were characterized using a general questionnaire and anthropometric measures. A validated food frequency questionnaire was administered and nutritional intakes were determined. The Nutritional Quality Index (NQI) of individual nutrients was calculated. Dietary vitamin C intake was significantly higher in the control group than the malignant group (200 and 146 mg/d, respectively; P=0.02; IC95%). Total dietary antioxidants were also higher in the control group compared to the malignant group (P=0.04). For iron, the NQI was significantly higher in the malignant group (1.82) compared to the control and benign groups (1.36 and 1.28, respectively; P=0.017; IC95%), indicating that the dietary iron intake of the malignant group exceeded the recommended nutritional intake. These results suggest a protective effect of vitamin C in BC development. Dietary iron appears to be associated with an increased BC risk, possibly through lipid peroxidation by heme iron. Further studies are needed to confirm the effect of dietary antioxidants and oxidants in the development and prevention of BC.