

LETTER TO THE EDITOR

Total Cholesterol and Triglyceride Levels in Patients with Breast Cancer

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High fat diet has long been considered as an important etiological factor in the development of breast cancer as per the principal dietary hypothesis [1]. The risk of development of breast cancer has also been found to increase with elevation in circulating lipid components except for high density lipoprotein cholesterol [2]. It has been found that women with breast cancer excrete higher levels of neutral steroids and bile acids, although their dietary intake of total calories, total fat and cholesterol does not exceed as compared to the controls [3]. These women also have a higher endogenous synthesis of cholesterol than controls. Studies conducted earlier have revealed that controls have lower cholesterol and triglyceride blood levels as compared to the breast cancer patients [4-7].

We would like to share with the readers of *Journal of Breast Cancer*, the results of our hospital based case-control study conducted in the year 2001 to 2003. The study was conducted amongst 160 breast cancer patients from the out-patient ward and hospital admissions of the Departments of Surgery/Surgical Oncology at the All India Institute of Medical Sciences, New Delhi. The criteria for selection of the patients was as follow: First, they should be proven cases of breast cancer by histopathology/cytopathology. Second, they should have not undergone any treatment specific for breast cancer. Third, they should not have suffered from any major chronic illness in the past, before the diagnosis of breast cancer so as to change their dietary pattern. Fourth, they should not have taken long course of any vitamin or mineral supplements during the last

1 year. Fifth, they should not be on corticosteroid therapy or suffering from hepatic disorders/severe malnutrition. One hundred and sixty normal healthy individuals accompanying the patients in the Department of Gastroenterology, Medicine and Surgery at All India Institute of Medical Sciences, New Delhi constituted the control group. The criteria for selection of the controls was as follow: First, the attendants of patients who did not suffer from any major illness in the past. Second, they should not have taken long course of any vitamin or mineral supplements during the last 1 year. Third, they should not be on corticosteroid therapy or suffering from hepatic disorders or severe malnutrition. The study was ethically approved by the Ethics Committee of All India Institute of Medical Sciences in New Delhi. All the investigations to be performed were explained to the subjects and those who consented for participation were included in the study. Venous blood (5 mL) was drawn from antecubital vein from both the cases and controls and collected in uncoated amber colored polypropylene tubes. The tubes were flushed with nitrogen for 30 to 60 seconds and tightly capped prior to blood collection. The tubes were then placed in an ice box and transported for centrifugation. The samples were centrifuged at 3,500 rpm at 4°C for 30 minutes for the collection of serum. The vials of serum samples were stored at -80°C until analysis. The estimation of total cholesterol and triglyceride was done utilizing the standard procedures [8,9]. All the estimations were repeated in triplicates and the mean of the three readings was taken as the final reading. Serum samples of known concentration of total cholesterol and triglyceride was estimated with each batch of assay as an internal quality control. The estimation was repeated for the batch of assay in which the control sample values were over or under estimated. The independent samples t-test or Student's t-test was utilized to compare the mean serum levels of total cholesterol and triglycerides between breast cancer patients and controls. The result was considered significant at 5% level of significance. The results of the study revealed that the mean age of the patients and controls was 45.29 and 40.98 years, respectively. Forty-seven

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percent of the patients and 65.0% of the controls belonged to upper lower socioeconomic status. The total cholesterol levels in patients and controls were found to be 181.22 ± 46.09 and 153.36 ± 46.32 mg/dL, respectively ($p < 0.001$). A significant difference was also observed in the triglyceride levels of patients and controls (170.19 ± 67.84 mg/dL vs. 149.27 ± 81.15 mg/dL) ($p = 0.013$). Studies conducted earlier have also revealed that controls have lower cholesterol and triglyceride blood levels as compared to the breast cancer patients. A case-control study conducted in India revealed that the plasma total cholesterol levels were significantly elevated among breast cancer patients (5.83 mmol/L) as compared to the controls (5.42 mmol/L) ($p < 0.05$). Similarly, the triglyceride levels were also found to be significantly elevated among breast cancer patients (2.36 mmol/L) as compared to the controls (2.06 mmol/L) ($p < 0.01$) [10]. Recent studies have also documented similar results [11,12]. In another case-control study, it was found that breast cancer patients had elevated levels of plasma total lipids, phospholipids and cholesterol, which were associated with increased amount of subcutaneous body fat as compared with the patients bearing non breast carcinomas [13]. Other studies conducted in Egypt and Libya found significantly higher mean total cholesterol levels in premenopausal patients while mean triglycerides level was significantly higher among postmenopausal patients [14,15]. The results of the present study revealed a strong association of total cholesterol and triglyceride levels with breast cancer in the Indian population.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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