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THE EFFECT OF NUTRITION ON RISK OF BREAST CANCER

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ABSTRACT

Introduction: The nutritional status has been related to breast cancer risk factors as well as to cancer treatment morbid mortality. Thus, its assessment is important for developing strategies for the promotion of nutritional status and breast cancer outcome.

Material and methods: Several different methods for nutritional assessment in breast cancer patients undergoing adjuvant therapy were used, including subjective global assessment (SGA), body mass index (BMI), and biochemical analysis (BA). The occurrence of complications during
Breast cancer treatment versus the nutritional status was assessed.

Results: We followed 86 women with age range 18-76 years. Most patients were considered malnourished (65%). Most patients experienced complications during breast cancer treatment, and associated with nutritional status.

Conclusion: In breast cancer women undergoing adjuvant therapy, the prevalence of undernutrition was high. There were the effects of poor nutrition or undernutrition on clinical outcomes of breast cancer.

KEYWORD

Breast cancer. Nutritional status, malnutrition, folic acid, body mass index

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INTRODUCTION

Globally, breast cancer is the second most common female cancer and leading cause of cancer death inwomen. The prevalence is increasing day to day by varying factor. The incidence rates are 3, 71302in world and 162, 468 in India[1,2,3.] Breast cancer was estimated to accounts for 23 % (1, 380,000) of all new cancer cases and 14% (458, 400) all of cancer death. Several study preventionsis the key to challenging the statistics at described that dietary factor and nutritional status plays a key role both on the risk factor breast cancer and their treatment outcome.

Correia and waitzverg, (2003), reported that malnutrition or under nutrition is directly link to breast cancer risk and associated with increasing rate of morbidity, mortality and longer hospital stays medical cost in addition malnourished cancerous patients are associated with efficacy[4,5,6,7,8,9.] Various evidence suggested that dietary folate is a vitamin B and found in natural source such as dark green leafy vegetable and many other food sources. It is so essential for generating methionine, the methyl donor for DNA methyalation, for producing the purins and pyrimidine thymidylate required for DNA synthesis and repair[10,11].Several study reported that folate involved in the prevention of neural tube defect, ovarian cancer, survical cancer and including cardiovascular disease risk[12,13].Another previous study showed that evaluates homocysteine level is directly link to progression and risk for breast cancer. Some study reported that plasma homocysteine concentration is inversely occurrence of clinical disease like cardiovascular and cerebrovascular diseases[14.] A variety of study have suggested that are range plasma homocysteine level is associated with folic acid (since these are required homocysteine metabolic) as per literature by folic acid or vitamin B intake is essential for nucleotide by synthesis DNA application and methyl group supply and thus for sale group and repair so many evidence suggest decrease folic acid and rage homocysteine foster the development of cancerous cell[15,] where high dose of folic acid may also enhance the growth of cancer cell[15].Another, most essential dietary micronutrient factor is vitamin D, also plays role in the prevention of breast cancer. Some recent reported have evidenced that higher level of vitamin D in their blood had a

45% decrease in breast cancer risk compared with women with the lowest of vitamin D in their blood[17].Only some studies have been shown the bonding between nutritional deficiencies and risk of breast cancer[15].However, various data have support a relationships between low folate intake,hyperhomocyteinemia and low vitamin D concentration and risk for type of cancer. So, reported that defective metabolism of hemoglobin associated with breast cancer. The current study was designed with aim to investigate the level of plasma homocysteine, folic acid and vitamin D and its association with breast cancer development.

MATERIAL AND METHOD

The present study a prospective and descriptive study performed in department of Radiotherapy and Radiation Medicine, Institute of medical science, Banaras Hindu University, Varanasi, U.P. Patients over 18-76 years old who were diagnosed with breast cancer and before they were started on chemo or radiotherapy were invited to participate in the study and all patients provided inform consent. A standardized questionnaire was use to collect data, including name, age, sex, stage of breast cancer and menopausal status. The body mass index (BMI) was calculated as weight in kilogram divided by the square of height in meters. The nutritional status of adult patients was determine according to the World Health Organization Criteria (WHO expert committee)[11]. The selected cases (n=86) of the breast cancer were subjected for evaluation of various nutrition factors like folic acid deficiency, iron deficiency and protein malnutrition including the measurement of vitamin D. The above measurements were carried out by ELISA method (CALBIOTECH-VDS5047).

STATISTICAL ANALYSIS

Statistical Package for Social Science (spss) version 19.0 software was used for statistical analysis. A p-value < 0.05 was considered statistically significant. The chi-square test was used to assess the association between nutrition factor and tumor stage.

RESULT

Table 1

General characteristics of patients with breast cancer (n=86)

Age	**N (%)**
18-35	15 (17.4)
36-50	47 (54.6)
51-76	24 (27.9)
Menopausal status	**N (%)**
Premenopausal	51 (59.3)
Postmenopausal	35 (40.6)
Late menopaus (≥55yrs)	19 (22.09)
Tumor stage	**N (%)**
1 stage	20 (23.2)
2 stage	45 (52.3)
3 stage	21 (24.4)

BMI	**BMI<25(N1=15) n%**	**BMI≥25,<30(N2 =47)n%**	**BMI≥30(N3=24) n%**
18-35	9 (10.4)	4 (4.6)	2 (2.3)
36-50	23 (26.7)	18 (20.9)	6 (6.9)
51-76	14 (16.2)	7 (8.1)	3 (3.4)

TABLE 2

Distribution of patients with breast cancer according to nutritional status parameters (n=86)

Subjective Global Assessment (SGA)	**N (%)**
Well nourished	21 (24.4)
Suspected or moderately malnourished	65 (75.5)
Body Mass Index (BMI)	
Low weight	53 (61.6)
Overweight	19 (22.09)
obese	14 (16.2)

A total of 86 women with age range 18-76 years were evaluated.The general population data are shown in Table 1 of this group, 59.3% (n=51) were premenopausal, and 40.6% (n=35) postmenopausal. It was reported by 22.09% (n=19) of the patients and late menopause was observed in 35.9% of the patients the stage of 1 patients diagnosed 23.2% (n=20) and stage of 2 52.3% (n=45) advance stage 3 tumor were diagnosed in 24.4% (n=21) of the patients. The nutritional status of the patients as determined using method is shown in table 2. Most of the patients were consider malnutrition. Independently of the method used low weight 61.6%, overweight 22.09% & obesity was found 16.2%.

TABLE 3

Distribution of patients with breast cancer according to biochemical parameters (n=86)

Total Cholesterol (TC)	**N (%)**
Normal (<200mg/dl)	39 (45.3)
High (≥200mg/dl)	47 (54.6)
High Density Lipoprotein Cholesterol (HDL)	
Normal (≥50mg/dl)	54 (62.7)
Low (<50mg/dl)	32 (37.2)
Low-Density Lipoprotein cholesterol (LDL)	
Normal (<160mg/dl)	65 (75.5)
High (≥160mg/dl)	21 (24.4)
Very Low-Density Lipoprotein cholesterol (VLDL)	
Normal (<30mg/dl)	68 (79.06)
High (≥30mg/dl)	18 (20.9)
Triglycerides (TG)	
Normal (<150mg/dl)	72 (83.7)
High (≥150mg/dl)	14 (16.2)
Glycemia (GLIC)	
Normal (<100mg/dl)	70 (81.3)
High (≥100mg/dl)	16 (18.6)

Biochemical parameters analysis showed that 54.6% of the patients exhibited high cholesterol 37.2% had low high-density lipoprotein cholesterol (HDL), 24.4% had increase low-density lipoprotein cholesterol (LDL) 20.9% had high very low-density lipoprotein cholesterol (VLDL) and 16.2% had hypertriglyceridemia (TG) elevated fasting glucose (GLIC) values were found in 18.6% of Table 3.

Table 4 showed that the hematological condition in different stages of breast cancer in comparison to various stages of breast cancer.

TABLE 4

Hematological parameters in different stages of Breast cancer patients

Groups	Average range of population (N=86)	95% CI of the limit of mean of average population	Stage 1 (N=20)	Stage 2 (N=45)	Stage 3 (N=21)	95% CI of the limit of mean in different stages		
						Stage 1	Stage 2	Stage 3
Hemoglobin (gm/dl) 12-15	13.5 ±3.8	7.6-19.4	10.5 ±2.6	8.6 ±2.8	7.8 ±3.2	10.163-10.837	2.87-14.32	7.33-8.27
Ferretin (ng/ml) 12-150	81 ±20.6	80.8-81.2	70.6 ±12.8	60.56 ±6.05	40.8 ±8.75	62.404-78.796	59.33-61.78	37.16-44.44

Iron (mg/dl) 50-170	110 ±24.8	109.87-110.13	88.5 ±10.8	70.2 ±8.6	60.5 ±8.6	82.7-94.3	69.59-70.80	56.76-64.24

From Table 5 it is evident that imbalance dietary factor like vitamin D, homocysteine, folic acid, total protein are associated with malnutrition and strongly associated with the prevalence of breast cancer

TABLE 5 BIOCHEMICAL PARAMETERS IN DIFFERENT STAGES OF BREAST CANCER PATIENTS

Groups	Average range of normal population (N=86)	95% CI of the limit of mean of average population	Stage 1 (N=20)	Stage 2 (N=45)	Stage 3 (N=21)	95% CI of the limit of mean in different stages		
						Stage 1	Stage 2	Stage 3
Vitamin D (ng/ml) 20-50	35.0 ±8.5	34.41-36.78	28 ±7.8	20.2 ±8.5	13 ±6.8	24.98-31.02	19.57-20.82	10.81-15.19
Homocysteine (µmol/l) 5-15	10.0 ±5.6	7.26-12.73	168 ±6.5	22.8 ±4.8	24.8 ±7.5	14.7-18.9	20.84-24.75	22.15-27.45
Folic acid (ng/ml) 2-20	11.0 ±5.9	8.53-13.46	8.5 ±3.22	6.5 ±2.85	7.8 ±2.8	7.982-9.018	0.96-12.03	7.428-8.172
Total Protein (g/dl) 6.40-8.10	6.6 ±2.6	6.10-19.30	6.2 ±1.6	5.8 ±1.8	5.2 ±1.4	1.58-13.98	8.08-19.68	5.49-5.21

DISCUSSION

Several epidemiological surveys provided strong support to demonstrate the relationship between malnutrition and breast cancer. A high prevalence of low weight and under nutritional was observed in breast cancer women. While under nutritional was high, yet present among these women. Although we were able to show any association between nutrition. A prospective study conducted in women diagnosed with breast cancer. In the present study the patients with a BMI of 30kg/m2 or lower had more advanced disease at diagnosis compared with patients with a BMI below 25kg/m2. Protein-energy malnutrition is very common in developing countries lack of educations, poverty and unregulated lifestyle are strongly associated with the development of breast cancer. As pointed out in the resulting protein-energy malnutrition is responsible for immunity not only immune phenomena, several other environmental factors like are strongly associated with breast cancer.

On the other hand, the high rate of low BMI among women with breast cancer may hamper the identification of poor nutritional status. Because nutrition status assessment is commonly neglected, this may be a particular problem among these women, as undernutriton is associated with poorer outcome and prognosis, decreased quality of life and shoddier functional status of patients.

Goodwin and beyond in their critical review observed of current studies noted that obesity and overweight are strongly associated with breast cancer. Increase fat-free lean body muscle mass and healthy diet is always recommended for the post-treatment survival rate of breast cancer patients. The relationship between dietary fibreintake survival and recurrence was studied in several cohorts breast cancer survivors.7, 8, and 9 also pointed at that type of nutritional is very much significant from the point of view of increase life acceptance after post-therapy of breast cancer patients. In our present series of study, we have noticed that hyperhomocysteinemia due to folic acid deficiency plays an important role along with Vitamin D deficiency. Inflammation particularlyIl-6 & TNF- have shown strong associated with improvement of general body health of breast cancer patients. Inflammatory breast cancer is highly progression and split almost all the vital organs particularly lungs, liver, brain & bone10.Cheryl and Wahnefried 2002 reported that nutritional factors are directly associated with survival of breast cancer patient. 6 Therefore, it is almost important that the nutritional status of breast cancer women is routinely assess and such as BMI and waist circumference should be performed as part of the treatment of these patients. Nutritional status assessment is common because these women as under nutrition is associated with poorer outcome and prognosis, decrease quality of life and worse functional status13 in the current study 24.4% of the patients were classified as suspected or moderately malnourished then assessed by SGA, as essential clinical assessment instrument14. SGA allows the early identification of patients with deficient nutritional status, especially in patients with altered body composition markers due to underweight15. Thus, the presence of under nutrition should be investigated in patients with breast cancer. Even those with mal nourished and since there are several tools, which present low intervariability diagnosis. It is suggested that a clinical method be used. The precision and accuracy of nutritional diagnosis16 Which is fundamental in cancer patients. The present study demonstrated the importance of emphasizing the role of nutritional assessment by different method and also the use of biochemical parameter to evaluate nutrition.

CONCLUSION

In summary, our study found evidence of a decreased risk of breast cancer associated with poor nutrition including low consumption of folate among women who do not regularly consume alcohol and increased homocysteine disturbed DNA synthesis, repair, and methylation process in cells. This relationship was especially apparent among subjects who also consumed lower amounts of methionine, vitamin B12 and vitamin D. This study raises the possibility of important nutrient-nutrient interactions in breast carcinogenesis. However, we recommend that the nutritional status be routinely assessed among these patients due to the high prevalence of nutritional imbalances, which are reported relevant impact factors on breast cancer patient outcome in Eastern Uttar Pradesh.

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CONFLICT OF INTEREST

There is no any conflict of interest between authors.

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