

A CROSS SECTIONAL STUDY TO EVALUATE THE ASSOCIATION OF METABOLIC SYNDROME WITH BREAST CANCER

Oncology

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ABSTRACT

Metabolic syndrome is upcoming as a threat for breast cancer ;however very few studies, most restricted to postmenopausal women have investigated the relationship between breast cancer risk and metabolic syndrome. Breast cancer is trending towards the direction of becoming the leading cause of oncologic morbidity and mortality among women globally. The expected rate of breast cancer in India is 80 new cases per 1, 00,000 population per year . The rapidly rising incidence of breast cancer especially occurring at younger age, with a higher percentage of high grade or grade III and IV tumors, and tumors that do not react to hormone therapy . India ranks number one in the number in DALY (Disability Adjusted Life Years) due to breast cancer, so this is the high time this trend needs to be broken ⁽⁵⁾. Breast cancer and metabolic syndrome both the problems have witnessed the insurgence in the recent past and targeting the female population of India. Metabolic syndrome is a group of diseases that has recently been projected to take part in breast carcinogenesis. The current study is endeavored to investigate the association between metabolic syndrome with histological grading and receptor status in breast cancer patients.

RESULTS AND OBSERVATION:Our study was a cross sectional study Department of General Surgery and onco surgery at father Muller Medical College Hospital, Mangalore during the time period between January 2019 to December 2019 on 142 female patients with FNAC proven carcinoma breast to study the association of metabolic syndrome in breast cancer patients by comparing with histological grading and receptor status in breast cancer patients and to find if metabolic syndrome had any effect on carcinoma .

METHODOLOGY:Stage 1 ,Stage 2 and Stage 3 respectively 89 cases 62.68% , 38 cases 26.76% and 15 cases 10.56% . 78 cases 54.93% , 43 cases 30.28% and 21 cases 14.79% were grade 1 , grade 2 and grade 3 respectively, ER+ve were 118 cases 83.10%, PR +ve were 95 cases 66.90% Her2u +ve were 32 cases 22.54%, triple negative were 22 cases . there was a good correlation between the grade of the tumour and the metabolic syndrome and also the triple negative disease .

CONCLUSION:In this cross sectional study we investigated the association between metabolic syndrome with and receptor status we found that statistical significant higher incidence of metabolic syndrome occurred in those with poorer histology or a receptor negative disease

KEYWORDS

Metabolic syndrome is upcoming as a threat for breast cancer ;however very few studies, most restricted to postmenopausal women have investigated the relationship between breast cancer risk and metabolic syndrome⁽¹⁾. Being overweight or obese harmfully affects disease free survival in triple negative breast, in India triple negative breast cancer is fast emerging as a more common cause of breast cancer especially in the younger population ⁽²⁾. Breast cancer is trending towards the direction of becoming the leading cause of oncologic morbidity and mortality among women globally. The expected rate of breast cancer in India is 80 new cases per 1, 00,000 population per year ⁽³⁾. The rapidly rising incidence of breast cancer especially occurring at younger age, with a higher percentage of high grade or grade III and IV tumors, and tumors that do not react to hormone therapy ⁽⁴⁾.

India ranks number one in the number in DALY (Disability Adjusted Life Years) due to breast cancer, so this is the high time this trend needs to be broken ⁽⁵⁾. Breast cancer and metabolic syndrome both the problems have witnessed the insurgence in the recent past and targeting the female population of India⁽⁶⁾.

Metabolic syndrome is a group of diseases that has recently been projected to take part in breast carcinogenesis. Metabolic syndrome mostly is followed by deposition of fat in intra abdominal tissue, organ damage and exposure to toxic substances i.e free radicals⁽⁷⁾.

The current study is endeavored to investigate the association between metabolic syndrome with histological grading and receptor status in breast cancer patients.

METHODOLOGY

Our study was a cross sectional study Department of General Surgery and onco surgery at father muller Medical College Hospital, Mangalore during the time period between January 2019 to December

2019 on 142 female patients with FNAC proven carcinoma breast to study the association of metabolic syndrome in breast cancer patients by comparing with histological grading and receptor status in breast cancer patients and to find if metabolic syndrome had any effect on carcinoma . Data was entered in Microsoft Excel and was expressed as average, percentage and mean $\pm$ SD, median (range) as appropriate. Karl Pearson co efficient\it was used to study .

RESULTS AND OBSERVATION

35.915 % belonged to the reproductive age group and 64.08% belonged to the post menopausal age group. The most common age group affected was 41-50 years with 43 cases, 30.28% and the next common age group was 51-60 years with 35 cases 24.65%. during the study we had 2 cases of breast cancer that were not included . Right sided lesions were noted in 104 cases 73.24% , cases belonged Stage 1 ,Stage 2 and Stage 3 respectively 89 cases 62.68% , 38 cases 26.76% and 15 cases 10.56% . 78 cases 54.93% , 43 cases 30.28% and 21 cases 14.79% were grade 1 , grade 2 and grade 3 respectively, ER+ve were 118 cases 83.10%, PR +ve were 95 cases 66.90% Her2u +ve were 32 cases 22.54%, triple negative were 22 cases . There was a good correlation between the grade of the tumour and the metabolic syndrome and also the triple negative disease .

DISCUSSION

Breast cancer is one of the most frequent cancers that are seen in females. In the present scenario cancer has become one of the foremost non communicable diseases internationally⁽⁸⁾. Among females, cancer of the breast is the important cause of morbidity and mortality. Breast cancer accounts for 23% of cancer cases that take place in females as. There are almost a lakh case of breast cancer yearly basis in the India and the numbers continue to rise With the advances that have been taking place in the field of health research, many markers have been established to be significant both in the diagnosis and in the therapy of cancer of the breast ⁽⁹⁾.

However the price and limited accessibility of such facilities makes an hindrance for the use of these modalities .There are a number of screening tools that are available to assist health care professionals for evaluation of breast diseases There are a number of screening methods that are available to assist health care professionals for evaluation of breast diseases most commonly the breast examination and the mammography⁽⁶⁾

A lot of factors are recognized to raise the risk of breast cancer , one of the factors that is changeable and implemented to raise the risk of breast cancer is the obesity including the postmenopausal obesity. Strategies that may help to reduce the risk of breast cancer include avoiding weight gain and obesity, engaging in regular physical activity, Understanding how modifiable lifestyle risk factors affect breast cancer incidence may have important implications for the prevention and management of this malignancy, especially in countries with a high disease burden⁽¹¹⁾.

Metabolic syndrome is emerging as a risk factor for various cancers including breast cancer ; however few studies, most confined to postmenopausal women have investigated association between breast cancer risk and metabolic syndrome especially in the Indian scenario^(12,13).

Though the exact mechanisms remain not totally understood , some of the mechanisms that are thought to play a role are^{(14,15):-}

- Insulin resistance is seen in patients with metabolic syndrome resulting in increased insulin secretion and hyperinsulinemia,
- Insulin resistance induced subacute inflammation caused by an gathering of immune cells in adipose tissue an altered secretion of 'adipokines' that exert mitogenic, angiogenic, and antiapoptotic actions have been implicated in tumor progression of carcinogenesis in breast cancer^(102,103).
- Insulin is known to have mitogenic, antiapoptotic, and angiogenic properties and these biological actions of insulin are implicated in cancer progression and mortality.
- Adipose tissue is a major constituent of tumor surroundings in breast tissue and there are interactions between cancer cells and adjacent adipocytes leading to formation of cancer associated adipocytes which by their precise secretory profile support tumor growth.

An individual who is overweight or obese has a poorer disease free survival in triple negative breast cancer.

The rate of triple negative breast cancer in India is increasing at a faster pace⁽¹⁶⁾.

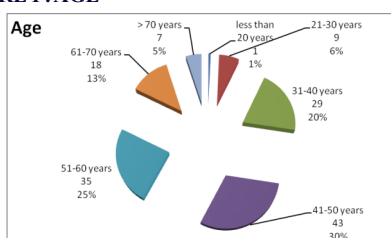
Li Gu et al in a systematic meta-analysis of 43 eligible studies of breast cancer found that those without metabolic syndrome were significantly higher compared with the controls . breast cancer cases with body mass index >25 significantly lymph node metastases showed significantly higher serum leptin concentration (SMD = 0.53, P = .015)⁽¹⁷⁾.

Claudia Agnoli et al on 22,494 Italian women observed that only high blood glucose was significantly associated with increased breast cancer risk in women who had metabolic syndrome components, (odds ratio 1.47, 95%CI 1.13-1.91)¹⁸.

CONCLUSION

In this cross sectional study we investigated the association between metabolic syndrome with and receptor status we found that statistical significant higher incidence of metabolic syndrome occurred in those with poorer histology or a receptor negative disease This is in concurrence with existing literature and validates our hypothesis. Further studies with a larger study population are recommended to give more information.

ANNEXURE 1 : AGE



ANNEXURE 2 : LESION CHARACTERISTICS

SIDE OF LESION	RIGHT	LEFT	TOTAL	P value
FREQUENCY	104	38	142	<0.0001
PERCENTAGE	73.24%	26.76%	100%	
HISTOLOGY	DCIS	LCIS	TOTAL	P value
FREQUENCY	124	18	142	<0.0001
PERCENTAGE	87.32%	12.68%	100.00%	
METABOLIC SYNDROME	yes	no	TOTAL	P value
FREQUENCY	78	64	142	<0.0001
PERCENTAGE	54.93%	45.07%	100.00%	
METABOLIC SYNDROME WITH AGE	less than 45 years	more than 45 years	TOTAL	P value
FREQUENCY	47	31	78	0.003
PERCENTAGE	60.26%	39.74%	100.00%	
TRIPLE NEGATIVE	METABOLIC SYNDROME PRESENT	METABOLIC SYNDROME ABSENT	TOTAL	P value
yes	20	2	22	<0.002
no	2	118	120	0.387
RECEPTOR STATUS	ER+ve	PR +ve	Her2u +ve	TRIPLE NEGATIVE
FREQUENCY	118	95	32	22
PERCENTAGE	83.10%	66.90%	22.54%	15.49%

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