



EFFECT OF BMI AND WAIST HIP RATIO ON RISK OF BREAST CANCER

General Surgery

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ABSTRACT

INTRODUCTION: Carcinoma Breast is the most common cancer in Indian female. 30% Of all female cancer. 20% of cancer related deaths in females. Body size is an important modifiable risk factor for breast cancer. But the effect of BMI and Waist-Hip Ratio is less studied in our population. **OBJECTIVES:** To study the effect of BMI and Waist-Hip Ratio on risk of breast cancer. **METHODS:** Patients admitted in the Department of General Surgery of Tirunelveli Medical College Hospital with Sample Size of 80 cases in two-year duration. Descriptive study done after getting clearance from the Ethical committee, BMI and WAIST-HIP RATIO calculated for each patient. **RESULT:** 80 patients who were affected by Carcinoma Breast were observed in our study. The parameters were observed, When the menstrual status and the hormonal receptor results were compared we have observed that post-menopausal women have higher incidence of hormone receptor positivity – 48/63 cases (76%) ER+ve, 36/63 cases (57%) PR+ve and the menstruating women have higher incidence of hormone receptor negativity – 9/14 cases (64%) ER-ve, 12/14 cases (85%) PR-ve, When the BMI and Hormonal receptor status were compared we have observed that there is positive correlation between BMI and ER & PR status with the significant P value (0.0001) irrelevant to their menstrual status. When the Waist Hip Ratio and Hormonal receptor status were compared we observed a negative correlation between Waist Hip Ratio and ER & PR status with significant P value (0.0001). **CONCLUSION:** The association of ER, PR receptors with BMI, Waist Hip Ratio and Menstrual status were evaluated. 55 patients (59%) were positive for estrogen receptor and 25 (31%) were negative. 41 patients (51.3%) were progesterone receptor positive and 39 (48.7%) were progesterone receptor negative. In premenopausal women the percentage of Hormonal receptors were negative. BMI was positively correlated with Hormonal receptors whereas Waist Hip ratio is negatively correlated. These results were comparable with the previous studies and thus reinforce the usefulness of estimation of the receptor status for treatment purpose in breast carcinoma.

KEYWORDS

Carcinoma Breast, BMI and WAIST-HIP RATIO, Hormonal receptor status.

INTRODUCTION

In India, it is the leading cancer among women in cities and second most common cancer in rural women. According to the National Cancer Registry, Bangalore had the highest age adjusted incidence rate in India, Chennai ranks third. GLOBOCAN (WHO) reports that India has the highest number of breast cancer deaths in the world (70218) followed by China (47984) and USA (43909). Effect of obesity on risk of breast cancer and its implications on hormonal receptors were studied in this study. On treating patients with carcinoma of the breast we were often confronted with the dilemma of how to identify those patients who were most likely to benefit from hormonal treatment. Hormonal receptor rich tumors respond to hormone therapy more frequently than do hormonal receptor poor tumors. Hormonal receptor status is the most important indicator in predicting the response of advanced breast cancer to hormonal manipulation and possibly chemotherapy.

AIM OF THE STUDY

To study the effect of BMI & Waist-Hip ratio on risk of breast cancer and its implications on post operative period regarding the predictability of hormonal receptor status.

OBJECTIVES OF THE STUDY

1. To study the effect of BMI & Waist-Hip ratio on risk of breast cancer,
2. To predict the hormonal receptor status in relation to the BMI and Waist Hip Ratio in Breast cancer,
3. To predict the tumor response to hormonal therapy,
4. To formulate the adjuvant treatment modality,

METHODOLOGY AND MATERIALS USED

Patients admitted in the Department of General Surgery of Tirunelveli Medical College Hospital with Sample Size of 80 cases in two-year duration.

Inclusion criteria: All patients presented with carcinoma breast in the

Tirunelveli Government College Hospital.

Exclusion criteria: Patients not willing for the study, Family history of Breast carcinoma, History of oral contraceptive intake/ Hormone replacement therapy.

Study Design: Descriptive study design
Study Setting: Tirunelveli Medical College Hospital
Sampling Method: Purposive sampling

Procedure:

After getting clearance from the Ethical committee and Informed consent in the native language of the patient, details of the patients were entered in the questionnaire. BMI and WAIST-HIP RATIO were calculated for each patient.

RESULTS

80 patients who were affected by Carcinoma Breast were observed in my study. The parameters which were observed,

1. Age
2. Menstrual status
3. Presentation
4. Quadrant of presentation
5. Pathological grade
6. TNM stage
7. BMI
8. Waist-Hip Ratio,

Common age group was 41-50 years & 51-60 years with 28 patients from each group out of 80 patients, 6 patients belong to 31-40 year group and 18 patients belong to 61-70 years age group. Many studies, including Momenimovahed Z, Salehiniya H. et al, suggest that perimenopausal age group is the most common age group, our studies also suggests the same.

When the menstrual status and the hormonal receptor results were compared, we have observed that post-menopausal women had higher incidence of hormone receptor positivity – 48/63 cases (76%) ER+ve, 36/63 cases (57%) PR+ve and the menstruating women had higher incidence of hormone receptor negativity – ER -ve cases 9/14 (64%), PR-ve cases 12/14 (85%) . Studies by, Huang WY et al, Pichon MF et al, Enger SM et al had supported this correlation between ER/PR expression and menstrual status of the patient .

Most common presentation was Lump (53.8%) then Lump with pain (21.3%), Lump with ulcer (18%) , lump with nipple discharge (5%) ,ulcer (1.2%), Most common side of presentation was left (55%) where as right was (45%), upper outer quadrant was the most commonly involved quadrant (23.8%), Upper outer with lower outer and upper inner quadrant involvement is respectively in next places (11.3%) and (10%),

Invasive Ductal Carcinoma was the single most common pathological type seen in our study ,a staggering (82.5%), followed by Ductal carcinoma in situ (6.25 %). Jaafar Makki et al supported this claim. Mean BMI of my patients observed in Our study was 25.05

Below 18.5 – Under weight

18.5 - 24.9 – Normal

25.0 – 29.9- Overweight

30 & Above – Obese

Where as mean Waist-Hip Ratio of my patients observed in my study was 1.00

0.80 or below – Low health risk

0.81-0.85 -Moderate health risk

>0.85–Highrisk

When the BMI and Hormonal receptor status were compared we have observed that there was positive correlation between BMI and ER & PR status with the significant P value (0.0001) irrelevant to their menstrual status. Nicoletta Biglia et al observed that elevated BMI correlated with hormonal receptor status of post menopausal women whereas no relation between BMI and Hormonal status in premenopausal women. Fei Wang ,Xiang wang,liyuan liu,Shu Wang et al observed positive correlation between BMI and Hormonal Receptor status only in premenopausal status women.

When the Waist Hip Ratio and Hormonal receptor status were compared we observed a negative correlation between Waist Hip Ratio and ER & PR status with significant P value (0.0001). This was supported by Fei Wang, Xiang wang, liyuan liu, Shu Wang et al which has also stated that Waist Hip Ratio is positively correlated with ER & PR negative Breast cancer.

Count		PR STATUS		Total
MENSTRUAL STATUS	hysterectomy done	Negative	Positive	
		2	1	3
		27	36	63
	menstruating	12	2	14
Total		41	39	80

in premenopausal female progesterone receptors were more positive where as in post menopausal female shows more negative status, resembling Estrogen counterpart.

Correlations				
	BMI	ER STATUS		PR STATUS
		Correlation Coefficient	0.548	.603*
		P value	<0.0001	<0.0001
	Waist Hip Ratio	Correlation Coefficient	-0.332	-0.295
		P value	<0.0001	<0.0001

** Correlation is significant at the 0.01 level (2-tailed).

Both Estrogen and Progesterone receptors were showing positive correlation with BMI. Both Estrogen and Progesterone receptors were showing negative correlation with Waist Hip Ratio. Central obesity was more correlated with hormonal receptor negative

Count		ER STATUS		Total
MENSTRUAL STATUS	hysterectomy done	Negative	Positive	
		1	2	3
		15	48	63
	menstruating	9	5	14
Total		25	55	80

In postmenopausal female(76%) ER receptors were showing more positive rate then premenopausal female (35%) which was significant.

CONCLUSION

In my study a total of 80 female patients with breast cancer in our institute were studied. The distinct effect of BMI and waist Hip ratio on risk of breast cancer and its implications on hormonal receptors were established.

The association of ER, PR receptors with BMI, Waist Hip Ratio and Menstrual status were evaluated. 55 patients (59%) were positive for estrogen receptor and 25 (31%) were negative. 41 patients (51.3%) were progesterone receptor positive and 39 (48.7%) were progesterone receptor negative.

Most of the tumours in postmenopausal women were hormone receptor positive. In premenopausal women the percentage of Hormonal receptors were negative. BMI was positively correlated with Hormonal receptors whereas Waist Hip ratio was negatively correlated.

These results were comparable with the previous studies and thus reinforce the usefulness of estimation of the receptor status for treatment purpose in Breast carcinoma.

REFERENCES:

1. Momenivahed Z, Salehiniya H. Epidemiological characteristics of and risk factors for breast cancer in the world. Breast Cancer (Dove Med Press).
2. Huang WY, Newman B, Millikan RC, Schell MJ, Hulka BS, Moorman PG. Hormone-related factors and risk of breast cancer in relation to estrogen receptor and progesterone receptor status. Am J Epidemiol. 2000 Apr 1;151(7):703-14. doi: 10.1093/oxfordjournals.aje.a010265. PMID:10752798.
3. Makki J. Diversity of Breast Carcinoma: Histological Subtypes and Clinical Relevance. Clin Med Insights
4. Biglia N, Peano E, Sgandurra P, Moggio G, Pecchio S, Maggiorotto F, Sismondi P. Body mass index (BMI) and breast cancer: impact on tumor histopathologic features, cancer subtypes and recurrence rate in pre and postmenopausal women. Gynecol Endocrinol.
5. Wang, Fei & Liu, Liyuan & Cui, Shude & Tian, Fuguo & Fan, Zhimin & Geng, Cuizhi & Cao, Xuchen & Yang, Zhenlin & Wang, Xiang & Liang, Hong & Wang, Shu & Jiang, Hongchuan & Duan, Xuening & Wang, Haibo & Li, Guolou & Wang, Qitang & Zhang, Jianguo & Jin, Feng & Tang, Jinhai & Yu, Zhigang. (2017).
6. Distinct Effects of Body Mass Index and Waist/Hip Ratio on Risk of Breast Cancer by Joint Estrogen and Progesterone Receptor Status: Results from a Case-Control Study in Northern and Eastern China and Implications for Chemoprevention. The oncologist. 22. 10.1634/theoncologist.2017-0148.