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Original Research Article

ALTERATION OF LIPID PROFILE IN BREAST CANCER PATIENTS AND ITS CORRELATION WITH HISTOPATHOLOGICAL GRADING AND STAGING

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Abstract:
Objective: Lipids have a key role in the maintenance of cell integrity. Hypolipidemia is related with increased risk of cancer and mortality. Lipids might be associated with cancers because they are important constituent of cell membrane. The aim of this study is to study the lipid profile in Breast cancer patients and to find out any correlation with histopathological grading and staging.
Material and method: Present study was undertaken in 70 histopathologically confirmed breast cancer patients in Department of Pathology Gandhi Medical College Bhopal, after taking informed written consent and ethical clearance. Lipid Profile were estimated and compared with age and sex matched healthy controls. Statistical analysis was done using chi square test.
Result: Total cholesterol and triglycerides were raised in cancer patients as compared to controls and this difference was statistically significant (p-value<0.05). Mean values of LDLC and VLDLC were also raised but not significant with p value>0.05. Hence it is concluded that total cholesterol and triglycerides are highly elevated in breast cancer patients. However, no correlation of altered lipid profile seen in grading and staging of Breast cancer.

Keywords: Breast cancer, Lipids, Dyslipidaemia, Metastasis, histopathology

1. Introduction:

Carcinoma of the breast is the second commonest malignancy affecting half a million women worldwide each year. It is one of the major causes of death among women between 40- and 44-years age group.[1]. Lipids are major cell membrane components essential for cell growth and division of normal and malignant cell. Lipids might be associated with cancers because they play a key role in the maintenance of cell integrity. Cells derive these lipids from the circulating lipoproteins and degradation of these major lipoprotein fractions can result in

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alteration of blood lipid levels, which are seen in various cancers. [2,3] Alteration in the circulatory cholesterol levels have been found to be associated with etiology of breast cancer and colorectal cancer. [4,5,6] It has been postulated that changes in the concentration of serum lipids in the breast cancer patients could result in an increase production of tumour necrosis factor and inhibit adipose lipoprotein lipase activity by the action of insulin. [7,8] The aim of this study is to study the lipid profile in Breast cancer patients and to find out any correlation with histopathological grading and staging.

2. Material and Methods

The present study was carried out in the Department of Pathology Hamidia Hospital, Bhopal from 1st Oct. 2012 to 31st Oct. 2013. Ethical permission for the study was obtained from the Ethical Research Committee Gandhi Medical College, Bhopal. Participation was fully voluntary and a written informed consent was taken from the patients after explaining the purpose of study. The study population was histopathologically diagnosed cases of breast malignancies. Biopsy specimen of Breast received in Department of pathology Gandhi Medical College Bhopal suspected of malignancy (diagnosed by FNAC, Ultrasonography or clinically) are included in this study. The biopsy specimens were histologically confirmed for malignancy and their respective grading and staging was done.

Inclusion criteria

- Subjects ready to give voluntary informed consent.
- Histologically diagnosed cases of breast malignancies.
- Only newly diagnosed cases.

Exclusion criteria

- Patients with any cardiac, renal, and hepatic dysfunction.
- Patient is on chemotherapy and Radiotherapy.

Control: Age and sex matched subjects who do not have any renal, hepatic, or cardiac dysfunction. Lipid profile includes measurement of serum total cholesterol, serum triglycerides, serum HDL, LDL and Serum VLDL. The measurements were done by Biosystems' kits using A25 and A15 analysers. Data was analysed using the Epi-info-7 software computer programme. Data was expressed as mean(x) and standard deviation (SD), Using Mann-Whitney/Wilcoxon Two-Sample Test (Kruskal-Walli's test for two groups) which was equivalent to Chi square. Value of $P < 0.05$ was considered significant, and $P>0.05$ was considered statistically insignificant.

3. Observation and results

The present case control study comprises 70 cases of breast cancers and age and sex matched controls (patient without any cardiac, renal, and hepatic dysfunctions) of cases received in Department of Pathology, Gandhi Medical College, Bhopal between oct 2012 to oct 2013.The salient observation made in this study are as follows.

Table1: distribution of cases according to age group (in yrs).

Age (yrs.)	No. of cases	Percentage	No. of controls	Percentage
31-40	07	10.00%	04	5.55%
41-50	31	44.29%	34	48.8%

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51-60	18	25.71%	15	21.55%
61-70	11	15.71%	15	21.55%
71-80	03	4.29%	02	2.88%
Total	70	100.00%	70	100%

Table 2: showing baseline characteristics of various parameters studied.

Variables	Mean (Cases)	Mean (control)	Min	Max	p-value
TC	136.62± 16.9	128.24±16.08	105	178	0.003
LDLC	124.11±15.98	120±15.24	101	172	0.681
HDLC	45.82±7.02	51.15±8.5	32	60	0.001
VLDL	32.6±4.02	30.7±3.97	22	44	0.414
TGL	162.92±40.07	141.5±30.76	110	220	0.002

Above table shows that Serum Total Cholesterol, HDL-C, LDL-C, VLDL-C and Triglycerides levels were raised in cases as compared to controls.

Table 3: showing correlation of studied parameters with lymph node metastasis.

Parameters	Lymph node positive (34)	Lymph node positive (36)	P value*
TC	138.5±15.42	135.2±17.31	0.334
LDLC	125.44 ± 15.24	122.86±16.7	0.355
HDLC	46.23 ± 6.59	46.44±7.49	0.63
VLDLC	32.29 ± 3.6	32.8±4.4	0.80
TGL	163.3 ± 20.75	162.2±19.38	0.96

Above table shows that total cholesterol and ldlc were raised in lymph node positive cases although is correlation was not statistically significant.

Table 4: Correlation of studied parameters blooms richardson's grading of breast cancer.

Parameters	Grade I (15 cases)	Grade II (41 cases)	Grade III (14 cases)	P value
TC	133.2±19.4	140±14.53	131.09±15.68	0.155
LDLC	121.4±17.8	126±15.3	119.2±14.06	0.264
HDLC	45.31±5.59	46.37±7.21	44.2±8.86	0.828
VLDLC	32.5±5.04	32.4±3.7	32.9±3.26	0.9005
TGL	162.8±25.23	162.25±18.8	165.4±15.72	0.8441

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Above table shows that studied parameters have no correlation with grading of breast cancer.

Table 5: corelation of studied parameters with tnm staging of breast cancer.

Parameters	stage I	stage II	stage III	StageIV	P value
TC	159±26.8	132.4±15.7	138.8±15.2	129±26.8	0.242
LDLC	147±35.35	121±15.20	125 ±15.29	115±7.07	0.407
HDLC	47±7.07	44.1±6.29	46.95±7.11	43±15.55	0.5777
VLDLC	34±0.01	32±5.2	32.8±3.2	29±4.24	0.3772
TGL	170±0.07	161±26	164±16	145±21	0.3533

Above table shows that the studied parameters have no significant correlation with staging of breast cancer.

4. Discussion

Maximum incidence of breast cancer was observed in 41-50 years. This is similar to studies done by Yu. Timo ska (2011) who observed cases between 30-60 years, however Pikul Laisupasin (2013) showed age incidence 40-70 years. [9,10] In the present study it was found that mean values of total cholesterol and triglycerides was raised in cancer patients as compared to controls and this difference was statistically significant(p-value<0.05) whereas mean value of HDL was low in cancer patients as compared to controls and was statistically significant .LDL and VLDL values were also high in cancer patients as compared to controls but did not show any significant correlation .These findings was corresponded to the previous studies by Kumar, Sachnandam in 1991 [11] and by Laisupasin,et al(2013).[12]
The observations made by them were as follows:

parameters	Reference ranges(mg/dl)	studies by Laisupasin al	p-value	Present study	P value
Cholesterol	120-200	217.48±47.66	0.062	128.24±16.08	0.003
LDL	0-130	143±40.01	0.001	120± 15.23	0.681
HDL	45-65	59.45±15.89	0.227	51.15±8.5	0.001
VLDL	0-40	29.63±18.98	0.000	30.7±3.97	0.414
TG	50-190	148.20±94.94	0.000	141.5±30.76	0.002

In the present study no significant alterations and correlation of studied parameters with grading and staging were found**.** SH. Thaw (2012) done similar study, they compared serum lipid profile with grading of breast cancer and found no corelation with grading. (p value <0.05)
Out of 70 cases of breast cancer 34 (48.57%) cases were showing lymph node metastasis. The total cholesterol, LDL, VLDL, TGL were raised in lymph node positive cases as compared to lymph node negative cases but this difference was not found to be statistically significant. (p-value>0.05)

5. Conclusion:

The current study has shown a significant alteration in the serum lipid profile in breast cancer patients but these alterations have no correlation with histopathological grading and staging. However, the major limitation of our study was the small sample size. Alteration in the circulatory cholesterol levels have been found to be associated with etiology of breast cancer.

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[13,14,15] It has been postulated that changes in the concentration of serum lipids in the breast cancer patients could result in an increase production of tumour necrosis factor and inhibit adipose lipoprotein lipase activity. Altered lipid profile can be the etiologic factor or can be the effect of carcinogenesis, this is still a conflicting point and Further studies should be carried out in large number of patients to confirm the role of these parameters with special attention to modifiable ones and their relation with staging and grading of cancer, which can be used as prognostic markers.

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