

Alteration in pre-operative and post-operative lipid profile – in carcinoma breast**Ashwin Hebbar K¹, Dhananjaya Kumar B R^{2*}, Madhan Swamy D P³, Mallikarjuna M⁴**¹Associate professor, Department of General Surgery, Shimoga Institute of Medical Sciences, Karnataka, India²Assistant professor, Department of General Surgery, Shimoga Institute of Medical Sciences, Karnataka, India³Assistant professor, Department of General Surgery, Shimoga Institute of Medical Sciences, Karnataka, India⁴Associate professor, Department of General Surgery, Shimoga Institute of Medical Sciences, Karnataka, India**Received: 10-06-2021 / Revised: 07-07-2021 / Accepted: 15-09-2021****Abstract**

Background: There is no single etiological factor or risk factor for carcinoma breast, it has been shown to have multiple risk factors. One such risk factor that is being widely accepted is that poor living conditions is associated with carcinoma cervix while carcinoma breast is seen more commonly in societies with better living conditions. In our study we wish to study the correlation between lipid profile and carcinoma breast. **Methods:** This was an observational prospective correlational study. Fasting lipid profile, after 12 hours of (fasting 9pm to 9am) was done on the day after admission and on the 7th postoperative day. **Result:** The change in the pre and post operative lipid profile was not statistically significant for any of the lipid profile parameters. **Conclusion:** In our study we did not find any statistically significant change in the lipid parameters pre and post operatively, thus showing that the removal of the primary tumor does have any effect on the lipid profile.

Keywords: lipid profile, carcinoma, breast

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Introduction

Breast cancer is the most common cancer in Indian women according to National Institute of Cancer Prevention and Research (NICPR), under Indian Council of Medical Research (ICMR) [1,2]. earlier the first position was occupied by carcinoma cervix [3]. For every 2 women diagnosed with Carcinoma breast, one woman dies of it in India [4]. Obesity is considered as an established risk factor for breast carcinoma [5].

However no single dominant etiological agent has been established and it is still a complex interplay of genetic susceptibility and environmental factors [6].

Some have reported that increased total cholesterol and HDL and decreased LDL have higher risk of breast cancer [7], while others have reported the reverse [8], while other studies have showed no association between the two [9].

Lipid profile typically consists of Triglycerides (TG), Total Cholesterol (TC), HDL (High density lipoprotein cholesterol), LDL (Low density lipoprotein cholesterol), VLDL (Very low density lipoprotein cholesterol), TC/HDL ratio and LDL/HDL ratio [10].

The aim of this study is to see if there is any correlation between altered (decreased or increased) lipid profile and carcinoma breast.

Material and Methods

This was an observational prospective correlational study.

Ethical clearance was obtained from the ethical committee of SIMS hospital, Shivamogga. All willing patients admitted at SIMS hospital with carcinoma breast during the year 2018 were included in the study. Exclusion criteria was patients not willing to give consent, patients on statins, and patients needing neoadjuvant chemotherapy, recurrent carcinoma breast. Fasting lipid profile, after 12 hours of (fasting 9pm to 9am) was done on the day after admission and on the 7th postoperative day. Patients were advised to maintain the same diet

during hospitalization pre and post operatively as they did prior to admission, and the dietary history of the patient from the preceding week prior to admission was noted so as to guide them to do the same. Normal range for the lipid profile was as follows [11] -

Lipid fraction	Reference values (mg/dl)
Tri glycerides	75-150
Total cholesterol	150-200
HDL	30-60
LDL	80-130
VLDL	20-40
TC/HDL	<4.5
LDL/HDL	<3

The pre and post operative lipid profile of the patients was assessed against above reference values to determine if they were within normal limits or altered (decreased or increased).

Statistical methods

Statistical Methods: Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean \pm SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance.

Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven's test for homogeneity of variance has been performed to assess the homogeneity of variance. A t-test is a statistical test that is used to compare the means of two groups. It is often used in hypothesis testing to determine whether a process or treatment actually has an effect on the population of interest, or whether two groups are different from one another with the null hypothesis (H₀) is that the true difference between these group means is zero and the alternate hypothesis (H_a) is that the true difference is different from zero.

Student t test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale with in each group.

Significant figures [12-15]:

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+ Suggestive significance (P value: 0.05<P<0.10)
 * Moderately significant (P value:0.01<P <0.05)

** Strongly significant (P value : P<0.01)

Results

Table 1: Age distribution of patients studied

Age in Years	No. of Patients	%
≤50	19	40.4
>50	28	59.5
Total	47	100.0

Mean ± SD=54.85±13.28

Table 2: Assessment of Triglycerides –a lipid parameters in two measurements of patients studied

Triglycerides	Pre-op	Post-op	% Difference
<75	8(17.0%)	3(6.3%)	-10.7%
75-150	23(48.9%)	23(48.9%)	0.0%
>150	16(34.0%)	21(44.6%)	10.7%
Total	47(100.0%)	47(100.0%)	0%

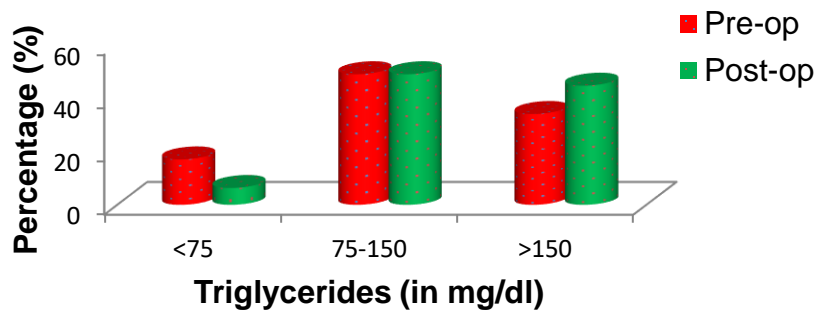


Fig.1 Percentage of cases with low , normal and elevated Triglycerides – pre and post operatively

Table 3: Assessment of Total Cholesterol –a lipid parameters in two measurements of patients studied

Total Cholesterol	Pre-op	Post-op	% Difference
<150	6(12.7%)	4(8.5%)	-4.2%
150-200	26(55.3%)	31(65.9%)	10.6%
>200	15(31.9%)	12(25.5%)	-6.4%
Total	47(100.0%)	47(100.0%)	0%

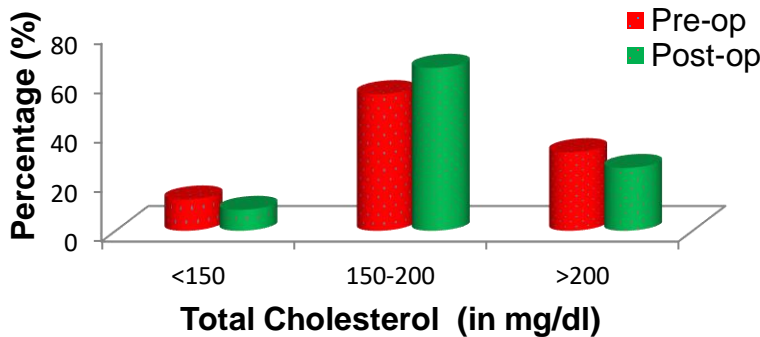


Fig.2 Percentage of cases with low , normal and elevated Total Cholesterol – pre and post operatively

Table 4: Assessment of HDL –a lipid parameters in two measurements of patients studied

HDL	Pre-op	Post-op	% Difference
<30	1(2.1%)	4(8.5%)	6.4%
30-60	41(87.2%)	39(82.9%)	-4.3%
>60	5(10.6%)	4(8.5%)	-2.1%
Total	47(100.0%)	47(100.0%)	0%

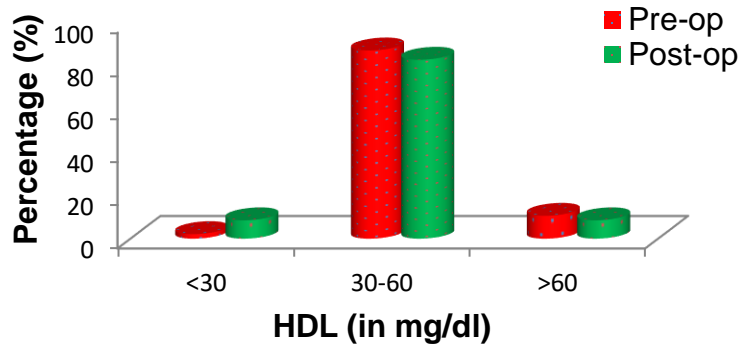


Fig.3 Percentage of cases with low , normal and elevated HDL – pre and post operatively

Table 5: Assessment of LDL –a lipid parameters in two measurements of patients studied

LDL	Pre-op	Post-op	% Difference
<80	7(14.8%)	5(10.6%)	-4.3%
80-130	26(55.3%)	31(65.9%)	10.6%
>130	14(29.7%)	11(23.4%)	-6.3%
Total	47(100.0%)	47(100.0%)	0%

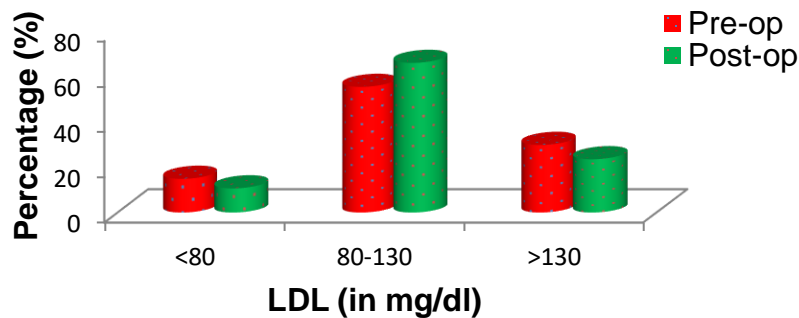


Fig.4 Percentage of cases with low , normal and elevated LDL – pre and post operatively

Table 6: Assessment of VLDL –a lipid parameters in two measurements of patients studied

VLDL	Pre-op	Post-op	% Difference
<20	10(21.2%)	5(10.6%)	-10.6%
20-40	29(61.7%)	35(74.4%)	12.8%
>40	8(17.0%)	7(14.8%)	-2.2%
Total	47(100.0%)	47(100.0%)	0%

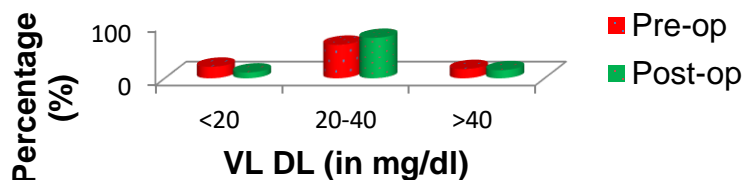


Fig.-5 Percentage of cases with low , normal and elevated VLDL – pre and post operatively

Table 7: Assessment of TChol/HDL –a lipid parameters in two measurements of patients studied

TChol/HDL	Pre-op	Post-op	% Difference
<4.5	29(61.7%)	28(59.5%)	-2.2%
≥4.5	18(38.2%)	19(40.4%)	2.2%
Total	47(100.0%)	47(100.0%)	0%

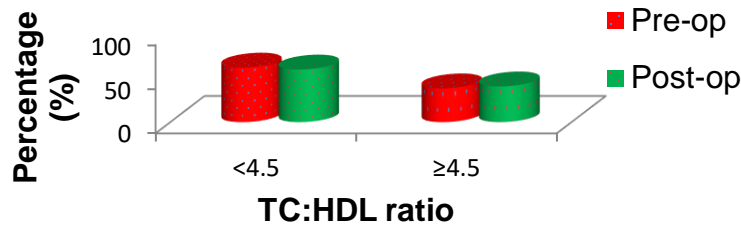


Fig.6 Percentage of cases with low and elevated TC:HDL – pre and post operatively

Table 8:Assessment of LDL/HDL –a lipid parameters in two measurements of patients studied

LDL/HDL	Pre-op	Post-op	% Difference
<3.0	30(63.8%)	29(61.7%)	-2.1%
≥3.0	17(36.1%)	18(38.2%)	2.1%
Total	47(100.0%)	47(100.0%)	0%

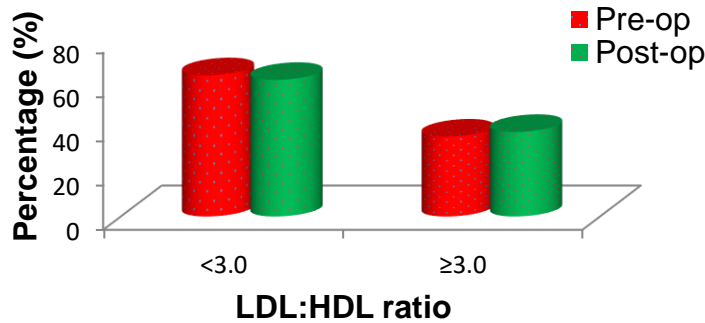


Fig.7 Percentage of cases with low and elevated LDL:HDL – pre and post operatively

Table 9:A Comparison of Lipid parameters between two measurements of patients studied

Variables	Pre-op	Post-op	Difference	t Value	P Value
Tri Glycerides	143.50±70.54	158.23±62.54	-14.72	-1.235	0.223
Total Cholesterol	188.00±40.53	188.12±36.83	-0.12	-0.024	0.981
HDL	48.12±23.44	43.12±9.85	5.00	1.448	0.154
LDL	113.47±34.93	114.76±32.40	-1.29	-0.266	0.791
VLDL	32.76±22.33	31.48±12.17	1.28	0.334	0.740
TC/HDL	4.62±2.30	4.53±1.37	0.08	0.235	0.815
LDL/HDL	2.81±1.16	2.74±1.02	0.074	0.426	0.672

Table 10:A Comparison of Lipid parameters according to age of patients studied

Variables	Age in years		Total	P Value
	≤50	>50		
Tri Glycerides				
• Pre-op	153.89±93.51	136.45±50.20	143.50±70.54	0.411
• Post-op	161.73±68.36	155.85±59.45	158.23±62.54	0.756
Total cholesterol				
• Pre-op	195.78±41.64	182.71±39.65	188.00±40.53	0.283
• Post-op	183.47±26.16	191.28±42.76	188.12±36.83	0.482
HDL				
• Pre-op	42.38±10.11	52.10±28.79	48.12±23.44	0.169
• Post-op	42.82±11.11	43.32±9.10	43.12±9.85	0.868
LDL				
• Pre-op	125.77±31.58	105.12±35.15	113.47±34.93	0.045*
• Post-op	111.37±24.63	117.06±37.03	114.76±32.40	0.560
VLDL				
• Pre-op	30.56±18.75	34.26±24.69	32.76±22.33	0.584
• Post-op	32.33±13.03	30.90±11.76	31.48±12.17	0.697
TC/HDL				
• Pre-op	4.78±1.54	4.51±2.72	4.62±2.30	0.694

• Post-op	4.56±1.44	4.51±1.34	4.53±1.37	0.889
LDL/HDL				
• Pre-op	3.11±1.27	2.61±1.06	2.81±1.16	0.151
• Post-op	2.71±1.02	2.76±1.03	2.74±1.02	0.884

Of the 47 participants involved in the study, 19 were less than age 50, 28 were more than 50 years of age.

Following favorable changes were noted in the lipid profile post operatively, pre and post operative comparison of total cholesterol showed decrease in the number of patients with elevated cholesterol by 6.4%, pre and post operative comparison of LDL showed a decrease in the number of patients with elevated LDL by 6.3% and pre and post operative comparison of VLDL showed a decrease in the number of patients with elevated VLDL by 2.2%.

Following unfavorable changes were noted in the lipid profile post operatively, pre and post operative comparison of triglyceride levels showed an increase in the in the number of patients with elevated triglyceride levels by 10.7%, pre and post operative comparison of HDL showed an increase in the number of patients with low HDL post by 6.4%, pre and post operative comparison of TC:HDL ratio showed a increase in the number of patients with elevated TC/HDL ratio by 2.2% and pre and post operative comparison of LDL:HDL ratio showed a increase in the number of patients with elevated LDL/HDL ratio by 2.1%.

However the change in the pre and post operative lipid profile was not statistically significant for any of the lipid profile parameters.

Discussion

Certain studies have shown HDL level to be higher in the subjects with extensive mammographic dysplasia and family history of breast cancer [16]. Other studies have shown that LDL was increased in breast cancer patients and total cholesterol level was not significantly increased. A large prospective study in Korea implicated that higher cholesterol increased the risk of breast cancer [17]. High Total cholesterol and TG levels have been reported in the tissue of malignant breast tumors as compared with benign tumours [18]. Gonenc A et al, the TC and HDL values were elevated in patients with BBD as compared with breast cancer patients, but LDL and TG levels were comparable between the 2 groups [19].

Michalaki et al showed significantly elevated levels of TG and cholesterol, whereas HDL levels were significantly decreased in patients with breast cancer as compared with controls[20]. Kokoglu et al showed significant increase in TG and VLDL and decreases in total, HDL, and LDL cholesterol levels. Fiorenza et al showed significantly lower TC, LDL, and HDL in breast cancer patients than in non-cancer subjects [21]. Ray and Husain showed significantly elevated TC, LDL, and TG and significantly decreased HDL in breast cancer patients as compared with the controls [22].

However data from other studies generally do not support the association between lipid profile and breast cancer risk [23].

Conclusion

In our study we did not find any statistically significant Change in the lipid parameters pre and post operatively, thus showing that the removal of the primary tumor does have any effect on the lipid profile.

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Conflict of Interest: Nil Source of support: Nil