Dr. Anshul Batalia
Asst. Prof., Dept. of General
Surgery, Bharati Vidyapeeth
Medical College, Pune,
Maharashtra, India

Dr. Shilpa Patankar
Asst. Prof., Dept. of General
Surgery, Bharati Vidyapeeth
Medical College, Pune,
Maharashtra, India

To estimate the serum LDH levels in patients diagnosed of breast carcinoma

Dr. Anshul Batalia and Dr. Shilpa Patankar

DOI: https://doi.org/10.33545/surgery.2021.v5.i2e.707

Abstract
Background & Method: This study was carried out over a period of Two Years (August 2014 to August 2016). The study was included 30 female age matched controls which do not have any other breast diseases and 30 female study subjects who had cytopathologically proven BREAST CANCER.
Result: In Study group, out of a total of 30 patients, 15 were found to have abnormal (> 460 IU/ L) levels of serum LDH. By using Chi-square test p-value < 0.05 therefore there is association between LDH level with group 1 and group 2.
Conclusion: The study had shown significant statistical difference in study group and control group which validates serum Lactate dehydrogenase as diagnostic marker. It is also observed that the values of Lactate dehydrogenase decreases with the due course of treatment, which can judge the response of disease to treatment especially in NACT protocol.

Keywords: serum, LDH, breast & carcinoma

Introduction
Worldwide Breast Cancer is the most common cancer in females with age-adjusted incidence rates of 124/1, 00,000 populations in the USA [1].
The incidence of breast cancer is less in India as compared to western world however it is rising cancer of urban Indian women and the second to carcinoma cervix in the rural women. As per ICMR-population based cancer registry data, breast cancer is the commonest cancer among women in urban registries of Delhi, Mumbai, Ahmedabad, Calcutta and Trivandrum where it constitutes more than 30% of all the cancer in women. In rural Population based cancer registry of Barshi, breast cancer is the second commonest cancer in women after cancer of the cervix [2].
The age adjusted incidence rates (AARs) ranges from 6.2 to 39.5 per 100,000 Indian women, one third that of Western countries with disproportionately higher mortality rate. It is attributed to young age which is associated with larger tumour size, higher number of metastatic lymph nodes, poorer tumor grade, low rates of hormone receptor-positive status, earlier and more frequent loco-regional recurrences and poorer overall survival [2, 3]
In India approximately 75,000-80,000 new cases are diagnosed annually as per the cancer registries in the country. The rise in incidence of 0.5-2% per annum has been seen across all regions of India and in all age groups but is more in the younger age group (<45 years) [4, 5]. A recent report by the Indian Council of Medical Research predict the number of breast cancer cases in India to rise to 106,124 in 2015 and to 123,634 in 2020 [6].

Material & Method
This study was carried out over a period of Two Years (August 2014 to August 2016). The study was included 30 female age matched controls which do not have any other breast diseases and 30 female study subjects who had cytopathologically proven Breast Cancer.
This study was conducted among the female breast cancer patients proven cytopathologically coming to this hospital.

Serum LDH values was be estimated in these patients.
1. Pre operative.
2. Pre chemotherapy
A. Neo adjuvant.

Corresponding Author:
Dr. Shilpa Patankar
Asst. Prof., Dept. of General
Surgery, Bharati Vidyapeeth
Medical College, Pune,
Maharashtra, India

B. Adjuvant.
3. 21 days after chemotherapy cycles.
4. 21 days after Surgery.
After seeking informed consent all the patient with breast cancer and controls who are willing to adhere to the estimation of serum LDH pre and post intervention i.e. Surgery/chemotherapy.

Exclusion Criteria
Those who have co morbid diseases like - -
1. Myocardial infarction
2. Myocarditis
3. Muscular dystrophy

Results

Table 1: Serum LDH values in study and control group before intervention

LDH Group before intervention	Group		Total	p-value
	Group 1	Group 2		
Normal (230-460 IU/L)	15	27	42	0.002
Abnormal (>460 IU/L)	15	3	18	
Total	30	30	60	

By using Chi-square test p-value < 0.05 therefore there is association between LDH level with group 1 and group 2.

Table 2: Levels of Serum LDH in study and control group

Serum LDH Values (IU/L)	No. of cases	
	Study	Control
230 - 460	15	27
461 - 500	1	3
501-600	7	0
601-700	4	0
701 - 800	1	0
801 - 900	0	0
More than 900	2	0

Table 3: Distribution of patients with abnormal levels of serum LDH after intervention

	Number of patients with abnormal LDH (before intervention)	Number of patients with abnormal LDH (after intervention)
After NACT	05	04
After 21 days of surgery	15	04
After 3 cycles of Chemotherapy	13	00

In Study group, out of a total of 30 patients, 15 were found to have abnormal (> 460 IU/ L) levels of serum LDH.

Table 4: Distribution of Serum LDH (Abnormal levels from study population) on various time interval

	Mean	No.
Before intervention	657.86	15
After NACT	522	5
After 21 days of surgery	403.53	15
After 3 cycles of chemotherapy	319.53	13

Table 5: Serum LDH in relation to Staging of Tumour

Staging of tumour	Mean LDH (IU/L)
I	00
IIA	490.09
IIB	406.87
IIIA	477.33
IIIB	1170
IIIC	00
IV	800

Discussion
A number of workers have tried evaluating the role of biomarkers in diagnosis of carcinoma breast but till date biochemical markers have not given promising result about diagnostic criteria [7].
Tumour associated markers reflect behavioural changes from tissue to blood, resulting in change in levels of enzymes, enzyme variants, proteins and hormones both in cancerous tissue and blood because of unchecked proliferation of cells [8]. Therefore alterations in particular enzyme contents in serum could be a good index of malignancy in its early and best manageable stage if sufficiently specific and sensitive.

In the present study the values of Lactate dehydrogenase were observed at various intervals i.e. before intervention, after neo-adjuvant chemotherapy, after 21 days of surgery and after 3 cycles of chemotherapy. Before intervention, out of the 30 cases in study group 15 patients were found to have abnormal (> 460 IU/L) levels of serum LDH as compared to only 3 (out of 30) patients in control group.

After intervention significant drop in serum LDH levels was

observed. After NACT, surgery and adjuvant chemotherapy, patients with abnormal levels of serum LDH were 04, 04 and 00 respectively. The mean LDH of study group at different intervals showed a decreasing pattern i.e before intervention (657.86), after NACT (522), after surgery (403.53) and after neo adjuvant chemotherapy (319.53)

The mean Lactate dehydrogenase in patients of breast cancer at the time of presentation was 515.96 ± 197.25 and that of control group was 309 ± 101.32 with a p value 0.0001, p<0.05 which is significant. Similar results were reported by Sandhya Mishra *et al.* (2004) [9], Amritpal Kaur *et al.* (2015) [7], RK Seth *et al.* (2003) [10] and Abdualla Jarari *et al.* (2013) [11].

Before intervention, the mean Lactate dehydrogenase was 515.96 IU/L with maximum of 1170 IU/L and minimum of 271 IU/L. After 21 days of surgery, the mean Lactate dehydrogenase was 350 IU/L with maximum of 510 IU/L and minimum of 210 IU/L. After 3 cycles of chemotherapy, the mean Lactate dehydrogenase was 296.32 IU/L with maximum of 420 IU/L and minimum of 210 IU/L.

It was observed that the levels of Lactate dehydrogenase significantly reduced with the due course of treatment. Similar results were reported by Sandhya Mishra *et al.* 2004 [9] and Amritpal Kaur *et al.* (2015) [7] in which the follow up was 21 days and 1 month respectively. The mean value of Lactate dehydrogenase on 21 days in a study by Sandhya Mishara *et al.* [9] was 360.2 IU/L which was in near correlation to the mean value of Lactate dehydrogenase in our study which was 435.45 IU/L. It was recommended that 1 month seems to be too short period for any significant change to occur in these parameters and a longer follow up is needed to establish prognostic importance of this investigation".

Conclusion

The study had shown significant statistical difference in study group and control group which validates serum Lactate dehydrogenase as diagnostic marker. It is also observed that the values of Lactate dehydrogenase decreases with the due course of treatment, which can judge the response of disease to treatment especially in NACT protocol.

References

1. Ries LA MD, Krapcho M, Stinchcomb DG, Howlander N, Homer MJ. SEER Cancer Statistics Review, 1975-2005. November 2007 SEER data submission 2008.
2. National Cancer Registry Programme: Consolidated report of the population based cancer registries, 1990-1996. Indian council of medical research, New Delhi 2001.
3. Agarwal GRP. Breast Cancer Care in India: The Current Scenario and the Challenges for the Future. Breast Care (Basel) 2008;3:21-7.
4. Sinha RAD, Mc Donald SS, Greenwald P. Cancer risk and diet in India. J Psotgrad Med 2003;49:222-8.
5. Chopra R. The Indian Scene. J Clin Oncol 2001;19:106-11.
6. Programme NCR. Time Trends in Cancer Incidence Rates 1982-2005. Bangalore, India. Indian Council of Medical Research 2009.
7. Amritpal Kaur MM, Sudhir Khichy. Biomarkers of Carcinoma Breast in Females. International Journal of Recent Scientific Research 2015;6(2):2625-9.
8. Crichlev DR WJ, Hynes RD. Cell surface and metabolic labelling of the proteins of normal and transformed chicken cells. Bio Chem Biophys Acta 1976;436:335-9.
9. Sandhya Mishra DCSAPS. Studies of biochemical parameters in breast cancer with and without metastasis. Indian Journal of Clinical Biochemistry 2004;19(1):71-5.
10. Seth RK KS, Kharb DP0. Serum biochemical markers in carcinoma breast. Ind J Med Sci 2003;57:350-4.
11. Abdalla M, Jarari SS, Saeid Omer Alsoaeitiv, Nouh MH. Aljarari, Anuradha.A, Jagannadha Rao Peela. Serum levels of LDH and Gamma GT in Libyan Breast Cancer patients. Indian journal of applied research 2013;3(12):32-4.