

TO DETERMINE THE SERUM PROLACTIN LEVELS IN BREAST CARCINOMA: A CASE CONTROL STUDY

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Abstract

Background: Breast cancer is the most common female cancer worldwide representing nearly a quarter (25%) of all cancers with an estimated 1.67 million new cancer cases diagnosed in 2012.

Methods: The study was conducted in the Department of General Surgery, SMS Hospital, Jaipur. Study duration: From March 2018 to February 2019 (1 year).

Results: In Cancer cases, Mean Serum Prolactin level was found to be 14.71 ± 16.73 while in control it was 8.26 ± 5.60 . Mean Serum insulin level was higher in Cancer cases (14.71) as compared to control (8.26). Range of prolactin level in breast cancer cases from 2.84 to 103.71 and Range of prolactin level in controls was from 2.79 to 33.12 Difference was found to significant.

Conclusion: By this study we can interpretate that serum prolactin level is an independent factor and can be used to know the risk of breast cancer in postmenopausal women. whenever serum prolactin level is raised in these women, we can advise necessary measure to these women to prevent or identify early breast cancer.

Keywords: Breast, cancer, Female

Introduction

Breast cancer is the most common female cancer worldwide representing nearly a quarter (25%) of all cancers with an estimated 1.67 million new cancer cases diagnosed in 2012(1) . It is the second cause of cancer death in developed region (198,000 deaths, 15.4%) after lung cancer (2) .

It accounts for 12% of all new cases and 14% of all cancer deaths. The worldwide increase in the incidence has been 1.5% per year (incidence +/ mortality -). In India, although age adjusted incidence rate of breast cancer is lower (25.8 per 100 000) than United Kingdom (95 per 100 000) but mortality is at par (12.7 vs 17.1 per 100 000) with United Kingdom.(3,4) There is a significant increase in the incidence and cancer-associated morbidity and mortality in Indian subcontinent as described in global and Indian studies.(5-9) According to Globocan 2012, India along with United States and China collectively accounts for almost one third of the global breast cancer burden. India is facing challenging situation due to 11.54% increases in incidence and 13.82% increase in mortality due to breast cancer during 2008–2012.(1) For Indian women with operable breast cancer who received standard multimodal treatment in the control arm of a recently published large randomized clinical trial from Tata Memorial Hospital (TMH), the 5 year disease free survival (DFS) rate of 70% and overall survival rate of 78% was reported(10) .

The present study was aimed to find out the relationship between breast cancer and levels of PRL and its influence on some histopathological parameters. Normal serum prolactin levels in adult females and males are 5- 50 ng/ml and less than 25ng/ml respectively. It is unequivocal that prolactin is an influential hormone in rodent mammary tumorigenesis. It has also been reported to be increased in cases of human carcinoma breast. The present study was undertaken to study the levels of serum prolactin in cases of carcinoma breast and the effect of mastectomy on its levels. The reproductive hormone prolactin is produced primarily by the pituitary gland and in lesser amounts by several other tissues, including breast tissue. Prolactin plays a central role in breast development, differentiation, and lactation, but experimental data suggest that, in addition to having a role in normal development, prolactin may have pro-carcinogenic effects. Prolactin is a protein hormone essential for the proliferation and differentiation of the lobuloalveolar cells during pregnancy and lactation and recent evidence revealed that prolactin has role in mammary tumorigenesis. Previous prospective studies have found an association between prolactin levels and increased risk of breast cancer. The connection between prolactin and cancer has been suspected for many years, but never conclusively proven.

MATERIALS AND METHOD

Study area: The study was conducted in the Department of General Surgery, SMS Hospital, Jaipur. Study duration: From March 2018 to February 2019 (1 year).

Study Design: Hospital based case control observational study

Sample Size (study population) : A sample of 37 eligible cases and 37 matched control would be required at 95% confidence interval and 80% power to verify the expected difference of 23.37% in proportion of cases with raised serum prolactin levels in both the group(26.7% vs 3.33%. The sample size is further rounded off and enhanced to 40 cases in each group.

INCLUSION CRITERIA

- CASES- Patients with histopathologically proven breast cancers in whom serum prolactin levels studies were to be done.
- Those patients who will give consent for the study.
- CONTROLS- matched women undergoing minor non breast surgeries in the department of surgery, SMS Hospital, Jaipur.

EXCLUSION CRITERIA:

Patient not giving consent Patient who are pregnant, lactating females and having disease or on drugs known to increase serum prolactin.

Methodology:

Source of Data : All patients with histopathologically proven breast carcinoma.

Method of Collection of Data: Patients with Breast carcinoma were included in the study. After explaining about the study to the subjects, an informed consent was obtained, followed by a detailed history with clinical examination with more emphasis given on serum prolactin, hormonal status with pathological parameters.

Statistical analysis :The data was coded and entered into Microsoft excel spreadsheet. Analysis was done using SPSS version20 (IBM SPSS STATISTICS inc., Chicago, Illinois, USA) Window software program. Analysis of the significance of difference of different percentages was tested using Pearson Chi-square test (X²-test) while t-test was used to analyse numeric data. Descriptive statistics included computation of numbers and percentages. Chi- square test were used for qualitative data whenever two or more than two groups were used to compare. Level of significance was set at P<0.05.

RESULTS

To find the evidence of difference in age between cases and control independent t test was carried out, mean age in case were 49.30 while in control group it was 29.75 difference was found to significant.

Table 1: Serum Prolactin of Cases and Controls

Serum prolactin	Cases	Control	p-value
Mean	14.71	8.26	0.001
SD	16.73	5.60	

In Cancer cases, Mean Serum Prolactin level was found to be 14.71±16.73 while in control it was 8.26±5.60 .Mean Serum insulin level was higher in Cancer cases (14.71) as compared to control (8.26).Range of prolactin level in breast cancer cases from 2.84 to 103.71 and Range of prolactin level in controls was from 2.79 to 33.12 Difference was found to significant.

Table 2: Grade wise distribution

Grade	Prolactin	
	Mean	SD
1	4.75	2.06
2	13.09	8.98
3	18.90	25.65
p-value	0.414	

In Breast Cancer cases mean of Grade I Tumour 4.75, mean of Grade II Tumour was 13.09 and mean of Grade III Tumour is 18.90. And p value is 0.414 that was insignificant.

Discussion

The study entitled TO DETERMINE THE SERUM PROLACTIN LEVELS IN BREAST CARCINOMA: A CASE CONTROL STUDY was conducted in the Department of General surgery, SMS Medical College, Jaipur during year 2018-2019. Our results suggest that increased serum prolactin levels are positively associated with risk of breast cancer especially in postmenopausal women. Association of prolactin level with different parameter as:-

In Cancer cases, Mean Serum Prolactin level was found to be 14.71±16.73 while in control it was 8.26±5.60 .Mean Serum insulin level was higher in Cancer cases (14.71) as compared to control (8.26). Range of prolactin level in breast cancer cases from 2.84 to 103.71 and Range of prolactin level in controls was from 2.79 to 33.12 Difference was found to significant as p value <0.05.

So there is a statistical significant association between serum prolactin and breast cancer risk. This result is similar to study done by Alhaj A.* Department of Biochemistry, Faculty of Medicine, University of Science & Technology, Sana'a(113) Also similar to study by by Tikk at al 2014(11) and tworoger at al 2013(12),ho et al 2009

Conclusion

By this study we can interpretate that serum prolactin level is an independent factor and can be used to know the risk of breast cancer in postmenopausal women. whenever serum prolactin level is raised in these women, we can advise necessary measure to these women to prevent or identify early breast cancer.

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