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## ORIGINAL RESEARCH

# Assessment of d-dimer levels among breast carcinoma patients

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**ABSTRACT**

**Background: To assess d-dimer levels among breast carcinoma patients**

**Materials & methods: A total of 100 breast carcinoma patients were enrolled. Complete demographic details of all the patients were obtained. Only those patients were included in which histopathologic confirmed diagnosis of breast carcinoma was present. A Performa was made and detailed clinical and medical history of all the patients was recorded. Blood samples were obtained from all the patients and serum D Dimer levels were evaluated using auto-analyser**

**Results: Mean D Dimer levels were found to be 2.74 µg/mL. Mean D-Dimer levels among patients with and without lymph node involvement was 2.981 µg/mL and 1.512 µg/mL respectively. Significant results were obtained while comparing the mean D-Dimer levels among patients with and without lymph node involvement.**

**Conclusion: D-Dimer levels are significant altered in breast cancer patients with lymph node involvement.**

**Key words: Lymph node, Breast cancer, D-Dimer**

## INTRODUCTION

Cancer cells are very similar to cells of the organism from which they originated and have similar (but not identical) DNA and RNA. This is the reason why they are not very often detected by the immune system, in particular, if it is weakened.Mammography is a widely used screening approach in the detecting of breast cancer and proved to help reduce the mortality effectively. The development of distant metastases is the primary cause of death in breast cancer patients. Although clinical and experimental trials have demonstrated the relationship between cancer and hemostasis but the exact mechanism is not fully understood. Thus, systemic activation of coagulation and hemostatic system in all cancer patients without thromboembolism has been still under investigation. Advanced breast cancer is either locally advanced or metastatic spread. There is correlation between cancer and hypercoagulation, global hemostasis is more frequently activated in patients with cancer.[1- 3]

D-dimer (or D dimer) is a fibrin degradation product (or FDP), a small protein fragment present in the blood after a blood clot is degraded by fibrinolysis. It is so named because it contains two D fragments of the fibrin protein joined by a cross-link. The cross-link between two D fragments remains intact, however, and these are exposed on the surface when the fibrin fragments are sufficiently digested. D-dimers are not normally present in human blood plasma, except when the coagulation system has been activated, for instance because of the

presence of thrombosis or disseminated intravascular coagulation.[4- 6]Hence; the present study was undertaken for assessing the d-dimer levels and their correlation with lymph node involvement in carcinoma breast.

## MATERIALS & METHODS

A total of 100 breast carcinoma patients were enrolled. Complete demographic details of all the patients were obtained. Only those patients were included in which histopathologic confirmed diagnosis of breast carcinoma was present. A Performa was made and detailed clinical and medical history of all the patients was recorded. Blood samples were obtained from all the patients and serum D Dimer levels were evaluated using auto-analyser. All the results were recorded and analysed using SPSS software.

## RESULTS

Mean age of the patients was 45.8 years. Mean D Dimer levels were found to be 2.74 µg/mL. Mean D-Dimer levels among patients with and without lymph node involvement was 2.981 µg/mL and 1.512 µg/mL respectively. Significant results were obtained while comparing the mean D-Dimer levels among patients with and without lymph node involvement.

**Table 1: Distribution of patients according to D-Dimer levels**

| D-Dimer levels (µg/mL) | Number of patients | Percentage |
|---|---|---|
| ≤0.25 | 5 | 5 |
| 0.26 to 1 | 7 | 7 |
| 1.01 to 2 | 30 | 30 |
| 2.01 to 3 | 10 | 10 |
| 3.01 to 4 | 30 | 30 |
| More than 4 | 18 | 18 |
| Total | 100 | 100 |
| Mean ± SD | 2.74 ± 1.45 | |

**Table 2: Correlation of D-Dimer levels with lymph node involvement**

| Lymph node status | Mean (µg/mL) | SD |
|---|---|---|
| Involved | 2.981 | 1.921 |
| Not involved | 1.512 | 1.584 |
| p- value | 0.000 (Significant) | |

## DISCUSSION

Malignant disease can show signs of venous thromboembolism years before the patient has any obvious clinical symptoms. By promoting neovascularization and metastasis, a vicious cycle is formed between procoagulant proteins and malignant tumor cells. There is evidence that activated fibrinogens prevent NK cell-mediated tumor cell elimination, improve circulating tumor cell survival, increase tumor metastasis potential, and lead to poor prognosis. Therefore, D-dimer, which is the end product of fibrinogen hydrolysis, has certain clinical value for the differential screening of benign and malignant tumors and prediction of the prognosis of tumors Studies have shown that D-dimer has a significant correlation with the diagnosis and prognosis of a variety of malignant tumors.[7- 10]Hence; the present study was undertaken for assessing the d-dimer levels and their correlation with lymph node involvement in carcinoma breast.

Fregoni V et al in their study preoperative D-dimer levels were evaluated in 142 consecutive operable breast cancer, receiving axillary lymph node dissection, either preoperatively planned (41) or after sentinel node biopsy (SNB). Forty-one (41) patients were candidate to

quadrantectomy or mastectomy plus axillary dissection, not satisfying eligibility criteria for SNB procedure. In second group, 101 patients were candidate for conservative treatment following SNB procedure. Patients with positive SN (22) received standard axillary dissection. In order to determine a threshold in D - dimer levels distinguishing between subjects with involved lymph-nodes and subjects with no lymph-nodal involvement, a ROC curve analysis was performed on both the whole sample and subgroups identified according to surgical procedure.[11]Di Castelnuovo et alperformed a study and noticed that elevated d-Dimer level was an independent of the presence of distant metastasis.[12]

Chaari et al investigated the impact of cancer-related characteristics on hypercoagulability biomarkers. Thrombin generation (TG) assessed with the Thrombogramme-Thrombinoscope®, levels of platelet derived microparticles (Pd-MP) assessed with flow cytometry, procoagulant phospholid dependent clotting time (PPL-ct) measured with a clotting assay and D-Dimers (were assessed in a cohort of 62 women with breast cancer and in 30 age matched healthy women. Patients showed significantly higher TG, Pd-MP, D-Dimers levels and shortened PPL-ct compared to the controls. The D-Dimers increased in patients with metastatic stage.[13]Zhang et al in a study also suggested that detectable fibrin dissolution, as measured by plasma D-dimer, is a clinically essential marker for lymphovascular invasion and going early tumor metastasis in operable breast cancer.[14]

Bhavesh D et al (2015) conducted a study on 90 patients and found that Plasma D-Dimer value was normal i.e. <0.25 mg/l in patients of benign breast diseases and healthy females, while in patients of diagnosed breast carcinoma it was increased in 90% of them. There was stasticaly significant correlation between Mean values of plasma D- Dimer and advancing stage of disease, tumour size histological grade and lymphovascular invasion.[15]

## CONCLUSION

D-Dimer levels are significant altered in breast cancer patients with lymph node involvement.

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