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**Original Article**

# Molecular Association of Breast Cancer in Pakistani Population

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**Abstract**

**Background:** Breast cancer prevalence is greater in more affluent countries among women with high socioeconomic status. Breast cancer is most common cancer; Diabetes is characterized by hyperinsulinemia with insulin resistance, which has been linked to an increased risk of breast cancer. Compared to those without diabetes, those with diabetes have a 30% increased relative risk of developing cancer.

**Methods:** Serum samples of normal healthy control, diabetics and cancer patients were collected from oncology wards of different Hospitals of Lahore like Jinnah, Mayo, Shaukat Khanum, In mol and Sheikh Zayed Hospital.. Different physical and biochemical parameters were assessed.

**Results:** Patients with diabetes had a considerably higher chance of developing breast cancer than those without the disease. Diabetes affects up to 16% of breast cancer patients, and breast cancer is linked to old age and obesity, two key risk factors for type 2 diabetes.

**Conclusion:** Compared to women without diabetes, women with diabetes over the age of 60 have an increased risk of breast cancer. Diabetic complications are more likely to occur in people with breast cancer. Medications that reduce insulin, such as metformin, may help people with obesity and type II diabetes reduce their body weight, their levels of insulin and insulin resistance, and their risk of developing cancer.

**Key words:** Breast cancer, diabetes mellitus, molecular association, Pakistan

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## Introduction

According to estimates, 9.6 million people

Will die from cancer in 2018, making it the second largest cause of death worldwide. The most prevalent cancer is breast cancer. After 10 years, micro metastases return in one-third of original breast cancer patients. Diabetes is characterized by hyperinsulinemia with insulin resistance, which has been linked to an rising risk of breast cancer. In the Pakistani population, we prospectively evaluated the molecular relationship between the prevalence of breast cancer and diabetes. Obesity is a severe issue that increases the risk of developing cancer as well as other chronic illnesses. Depending on the normal range for various populations, the World Cancer Research Fund (WCRFPublic)'s Health Goals currently recommend that the median adult BMI be maintained between 21 and 23 kg/m2. The second-leading preventable cause of cancer after smoking is being overweight or obese, which is thought to result in 18,100 new cases of cancer each year in the UK. The drug that are used to treat the Diabetes Mellitus for example Motorman has ability to oppose the cancer cells and have anti-carcinogenic properties and currently gained a big importance in the field of biomedical sciences for the therapy of breast cancer Breast, pancreatic, hepatocellular, and colorectal cancer risk and death are lower in people with diabetes being treated with metformin.

## Methods

Samples of Diabetic and 200 Cancer patients were collected from the Endocrinology & Oncology department and wards of Jinnah, Mayo and Sheikh Zayed Hospital Lahore and 100 normal healthy control subjects were selected. In order to evaluate the level of proteins, the serum level of samples is initially estimated and tested by different standard procedures including HPLC assay of each sample.

## Result

**Table 1:** *Physical parameters of control, diabetic and cancer.*

| Parameters | Control (N=100) | Diabetics Female(N=100) | Female(N=100) |
|---|---|---|---|
| Age (years) | 50.8±1.30 | ***62.36±1.99 | 51.29±1.40 |
| Weight (kg) | 60.5±1.2 | ***66.96±1.55 | 70.61±1.92 |
| Height (m) | 1.66±2.12 | 1.54±0.04 | 1.59±0.09 |
| BMI ($kg/m^2$) | 25.4±0.40 | ***28.01±0.57 | 28.32±0.59 |

**Table 3:** *Lipid profile of control and diabetic females*

| Parameters | Control (N=100) | Female (N=100) |
|---|---|---|
| Cholesterol (mg/dl) | 150.2±3.95 | 163.78±7.15 |
| LDL (mg/dl) | 96.08±2.15 | **103.58±4.4 |
| VLDL (mg/dl) | 28.03±1.45 | 33.14±1.65 |
| HDL (mg/dl) | 44.48±0.62 | 38.68±0.59 |
| Triglycerides (mg/dl) | 140.24 ± 10.29 | ***189.72±12.02 |

**Table 2:** LFTs of control, diabetics and cancer

| Parameters | Control (N=100) | Diabetic Female (N=100) | Cancer Female(N=100) |
|---|---|---|---|
| Bilirubin (mg/dl) | 0.71±0.02 | 0.634±0.009 | 1.16±0.10 |
| ALP (U/L) | 103.3±1.25 | ***232.68±10.13 | 111.68±2.12 |
| ALT (U/L) | 42.04±4.56 | 45.18±6.84 | 33.14±2.59 |

Table 4: *Renal Function Tests of control, diabetics and cancer*

| Parameters | Control | Diabetic Female (N=100) | Cancer Female (N=100) |
|---|---|---|---|
| Creatinine | 1.0±0.30 | 0.89±0.25 | 0.844±0.10 |
| Uric acid | 4.9+0.40 | 5.58±0.62 | 2.96±0.21 |

**Table 5:** Total serum protein in normal, diabetics& cancer

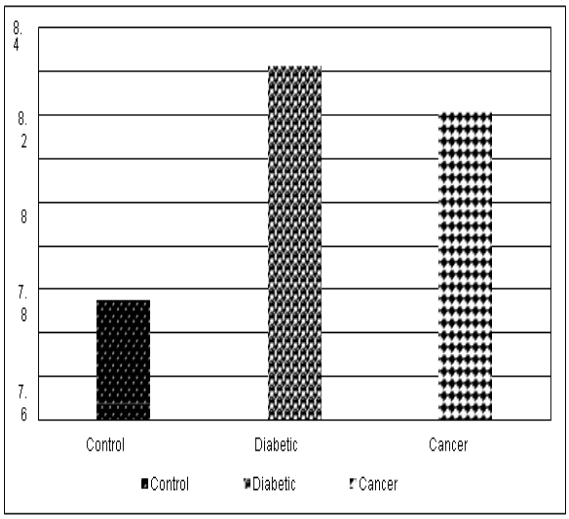



**Fig 1:** *SDS-PAGE results*

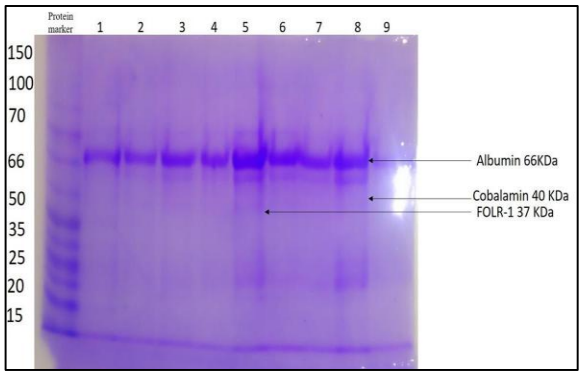
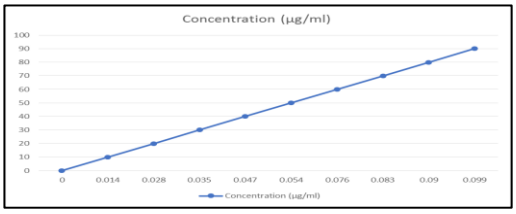



**Fig 2:***Standard absorption curve vs BSA protein concentration*




## Conclusion

Epidemiological evidence recommends that the incidence of cancer is related to diabetes and to certain risk factors and treatments for diabetes.Additionally, there was a strong correlation between diabetes and vulvar and

vaginal cancer. Later in vitro experiments demonstrated that the anti-diabetic drug metformin, which lowers cancer mortality in patients with diabetes, also suppresses the growth of cancer. Patients with insulin resistance and hyperinsulinemia who are receiving metformin therapy see a relatively little reduction in their blood glucose and insulin levels. Despite recent advancements in diagnosis and treatment, CRC remains a significant global public health issue. In order to reduce CRC mortality, early diagnosis, effective treatment and analysis prognosis were therefore of great importance.

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