Summary

Background:

Anthracyclines are considered to be among the most active agents for the treatment of breast cancer. However, their use is limited by cumulative, dose-related cardiotoxicity. Such cardiotoxicity results in a permanent loss of cardiac myocytes and a progressive reduction in cardiac function following each subsequent dose of anthracycline. Initially, damage to the heart is subclinical; however, increasingly impaired cardiac function can result in cardiovascular symptoms, with serious cardiac injury resulting in chronic heart failure. Since the early detection and treatment of cardiotoxicity can reduce its clinical effects, it is important that doctors must be aware of these adverse effects and manage them appropriately.

Aim of the work:

To find out the cardiotoxic effect of anthracycline cardiotoxicity among patients with breast cancer and to identify the risk factors for anthracycline cardiotoxicity.

Patients and Methods:

50 patients with breast cancer subjected to doxorubucin treatment were included in the study. The ages ranged between 35 to 59 years with a mean age of 48.2 ± 6.2 years. 7 patients (14%) were hypertensives, 9 patients (18%) had Diabetes Mellitus, 3 patients (6%) had dyslipidemia, 4 patients (8%) had +ve family history of premature CAD **Table (1) .**

Patients with advanced breast cancer, with metstatasis, with renal or hepatic impairement and those with either valvular or ischemic heart disease were excluded from the study.

All patients included in the study were subjected to the following:

Full history taking, complete general and local examination of the heart, chest and abdomen, 12 leads resting ECG, and full transthoracic echo-Doppler study before and after 6 months of anthracycline chemotherapy.

Results

Results of the current study regarding clinical examination before and after chemotherapy showed that The diastolic BP increased significantly from70 ± 18.2 mm Hg to 79.8 ± 11.0 mm Hg ($p < 0.05$). Dyspnoea and murmur of mitral regurgitation developed in 5(10%) and 6(12%) cases respectively after chemotherapy.Abnormal findings in the ECG developed in 7 patients (14 %).There was no significant change in the pulse and systolic blood pressure ($p > 0.05$) **Table (2).**

Results of the current study regarding the echocardiographic study before and after chemotherapy showed that there was no significant difference between the different echocardiographic parameters except for the incidence of mitral regurgitation and incidence of diastolic dysfunction which developed in 6(12%) and 5(10%) patients respectively **Table(3).**

The current study showed that the incidence of complications was dilated cardiomyopathy in 3 patients (6%), pulmonary hypertension in 2 patients (4%), significant mitral regurgitation in 6 patients (12%), DVT in 2 patients (4%), and diastolic dysfunction in 5 patients (10%) **Table (4).** Eleven patients (22 %) developed one or more of these complications **Fig (7)**.

In the present work the comparison between patients with and without complications showed that the mean age of the patients with complication was significantly older than those without complications (51.2 ± 6.6 yrs vs 43.6 ± 4.9 yrs,$p < 0.05$).There was significant difference between the two groups regarding the prevalence of diabetes Mellitus (36.4 % vs 12.8 % , $p <0.01$) and hypertension (36.4 % vs 7.7 %,$p <0.001$). The mean cumulative dose of anthracycline was significantly higher among patients with complications (650 ± 150 vs 450 ± 100 , $p < 0.001$) **Table (5)**.

Additionally, the comparison between patients with and without complications showed that the mean heart rate was significantly higher among patients with complications (87.9 ± 10.6 vs 73.5 ± 6.5,$p < 0.05$), the diastolic BP was also significantly higher among patients with complications (83.5 ± 15.0 vs 76.5 ± 15.9,$p < 0.05$). The incidence of dyspnoea were significantly higher among patients with complications (36.3% vs 2.6%,$p < 0.05$). the presence of murmur (27.3 % vs 7.7 %, $p<0.05$) and prevalence of Abnormal ECG (45.5 % vs 5.1 %,$p < 0.05$) were significantly higher among patients with complications **Table(6)**.

As regard the echocardiographic data the comparison between patients with and without complications revealed that the group with complications had a higher mean LVEDD (5.3 ± 0.8 cm vs 4.7 ± 0.5, p < 0.05) and higher mean LVESD (3.7 ± 0.8 cm vs 2.6 ± 0.4, p <0.05), They also had a significantly lower mean FS (29.4 ± 6.3 vs 38.5 ± 5.6, p < 0.05) and lower mean EF (56.5 ± 7.2 vs 69 ± 6.7, p < 0.05) than those without complications **Table (7)** & **Fig** (**13,14**) There was no significant difference between patients with complications and those without regarding the PWT, SWT, RVDD, LAD, and aortic root diameter (P > 0.05) **Table (7).**

Multivariant analysis of the different risk factors for the occurrence of cardiovascular complications after chemotherapy showed that cumulative dose > 500 mg/m^2 were the most significant predictor (relative risk = 4.2 and 95% confidence interval between 2.0 -9.8), P < 0.001),then hypertension and diabetes mellitus (relative risk = 2.8 and 95% confidence interval between 1.7 – 6.3) (P < 0.01). No other factors were found to have a significant prediction for the occurrence of cardiovascular complications after chemotherapy.

The results of the present study was tabulated and statistically analyzed.