

OXIDATIVE STRESS DURING CARDIAC CATHETERIZATION

ABDULAMEERABDULBARI AL-AMERI¹, LAYLA OTHMAN KHALIDAL-ABDULLA² &
AHMEDBADARABDUALWAHID³

¹Assistant Professor, Department of Internal Medicine, College of Medicine, University of Basrah, Iraq

²Assistant Professor, Department of Physiology, College of Medicine, University of Basrah, Iraq

³Lecturer, Department of Physiology, College of Medicine, University of Basrah, Iraq

ABSTRACT

Background

Cardiac catheterization (coronary angiogram) is an invasive imaging procedure to check heart function and to determine the need for treatment (like an interventional procedure or coronary artery bypass). Contrast material which contains usually iodine dye is injected through the catheter and fluoroscopy is performed as the contrast material moves through the heart's chambers, valves and major vessels. It was found that high amounts of free radicals (which pose a threats to our health & to DNA strands) are released from interaction of ionizing radiation and tissues and results in catastrophic numbers of different cancers. Iodine which is used in the contrast media also regarded as oxidizing agent.

Aim of the Study

To investigate whether the procedure of cardiac catheterization causes oxidative stress to the body or not through its effect on the level of GSH in the erythrocytes & on the activity of granulocytes by mean of chemiluminescence.

Methods

This study was carried out at the cardiac catheterization unit at Al- Sadar teaching hospital Basrah & involved 49 patients (who were known & controlled cases of hypertension & diabetes mellitus). They were selected randomly & were undergoing cardiac catheterization, their ages ranged from 35 -66 years with mean of (52.04±7.95). 34 were males and 15 were females.

The patients were divided into 3 groups, the first group consisted of 26 patients, the second group consisted of 13 patients & the third group consisted of 10 patients. For all patients we measured the level of erythrocytes reduced glutathione (the natural antioxidant system) & W.B.Cs activity through chemiluminescence phenomena before catheterization. Then immediately after catheterization for the first group, after 2hrs for the 2nd group & after 4 hrs for the third group

Results

In the first group, the level of GSH significantly decreased from 74.18±39.23mg% before catheterization to 59.45±22.53mg% immediately after catheterization (P<0.01) & the peak of CL significantly increased from 10.93±4.83cm to 12.22±4.84cm (p=0.001) with significant decrease in the total WBCs count from 7.53±1.85x10³ cells/μ to 6.43±1.22x10³ cells/μ (<0.05).

In the 2nd group, the level of GSH significantly decreased from 66.09±20.99 mg% before catheterization to

55.55±25.91mg% after 2hrs after catheterization(<0.05) & the peak of CL insignificantly increased from 11.16±3.51 cm to 12.08±2.65cm (p>0.05) with insignificant decrease in the number of W.B.Cs from 8.74±2.62 x10³ cells/μ to 7.31±2.69 x10³cells/μ(>0.05) In the 3rd group , , the level of GSH significantly decreased from 111.89±33.86mg% before catheterization to 99.81±27.9mg% after 4hrs after catheterization(p<0.005)& the peak of CL significantly increased from 7.5±1.63cm to 9±1.97cm (p<0.05) with significant decrease in the number of WB.Cs from 10.42±1.43x10³cells/μ to 8.6±2.02x10³cells/μ(p=0.05) .

Conclusions

Cardiac catheterization can cause significant oxidative stress to the patient tissues as a results of ionizing radiation and iodinated contrast media used during the procedure, this need further study to assess its short & long term clinical effects on the patients health.

KEYWORDS: Cardiac Catheterization, Oxidative Stress