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MOLECULAR GENETICS AND ENDOTHELIAL PROGENITOR STEM CELLS CIRCULATING DURING CARDIAC CATHETERIZATION PATIENTS

Thesis

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كلية البنات للآداب والعلوم والتربية
قسم علم الحيوان

الوراثة الجزيئية ودورة الخلايا الجذعية المهيأة للخلايا المبطنة للأوعية أثناء عمليات قسطرة القلب

رسالة مقدمة كجزء من متطلبات الحصول على درجة الماچستير فى العلوم
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جامعة عين شمس

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أستاذ البيولوجيا الجزيئية المركز القومى لبحوث وتكنولوجيا الاشعاع هيئة الطاقه الذرية

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(٢٠١١)

Abstract

Interventional cardiology plays a crucial role in the diagnosis and treatment of congenital heart disease. The justification of these interventional procedures is evident because complicated invasive surgery can be avoided. However, patient exposures to X-rays used in these complicated procedures can be high .

The present study is designed to identify the number of circulating endothelial progenitor stem cell (EPCs) ($CD133^{+}$/ $CD34^{+}$ / $CD133^{+}$ $CD34^{+}$ / SDF-1) by flow cytometry before and after 24 hours from cardiac catheterization, and to study chromosomal aberrations before and after the effect of ionizing radiation on catheterization patients.

This study was carried out on 40 patients before and after 24 hours from cardiac catheterization procedure with age ranged between (40- 65 year) divided into (< 50 years and > 50 years) and the control group included 10 healthy men.

The present study revealed that mean of EPCs ($CD133^{+}$,$CD34^{+}$,$CD133^{+}CD34^{+}$) was significantly decrease

in patients before and after cardiac catheterization when compared to control group ($P<0.0001$, $P<0.001$, $P<0.05$) and a significant increase in SDF-1 in patients after cardiac catheterization compared to control group.

Concerning cytogenetic study, the structural and numerical chromosomal aberrations significantly increase in patients after cardiac catheterization (21.06%) than patients before cardiac catheterization (5.93%) and control group (4.8%).

It is important to mention that , the karyotyping in all cases found that monosomy in chromosome 20 in patients before cardiac catheterization in 3 cases (15%) and increased to 40% after cardiac catheterization in 8 cases . Also through G/T banding in patients after catheterization found trisomy in chromosome 3 in one case.

The present data found that an inverse correlation between endothelial progenitor stem cells and chromosomal aberrations by increased in the number of progenitor stem cells, the number of structural and numerical chromosomal aberrations was decreased and vice versa .

In conclusion ,this study clearly showed that a significant decrease in the number of circulating endothelial cell in patients with coronary artery disease and a significant increase in chromosomal aberration after cardiac catheterization.

The present study suggested that prolonged exposure of man to X-rays may result in genetic damage it is obligatory on the part of hospital management to take appropriate steps to minimize exposure to X-rays at the workplace.

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