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Original Article

Oxidative Stress and Homocysteine Metabolism Following Coronary Artery Bypass Grafting by On-pump and Off-pump Techniques

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Abstract:

Background: *It is well documented that coronary artery bypass grafting (CABG) with cardiopulmonary bypass (CPB) causes ischemia and oxidative stress of the whole body. To compare the effect of on – pump and off –pump CABG on the induction of the oxidative stress and the metabolism of homocysteine which is involved in the synthesis of glutathione was investigated in the CABG patients during the early postoperative period.*

Methods: *Plasma homocysteine, folate total antioxidant capacity (TAC) and malonedialdehyde (MDA) were determined by standard methods on blood samples obtained from 40 patients undergoing CABG , preoperatively and at 0,12,48,120 hours and 6 months after surgery ,The patients were divided into two matched groups. One of the groups underwent off - pump and the other on – pump CABG.*

Results: *A marked reduction of homocysteine, folate and significant elevation of MDA were noticed at 0, 12, 48 hours after operation in the both groups ($P<0.05$). A negative and marked correlation between homocysteine and TAC but a positive and significant correlation between homocysteine and MDA were observed ($P<0.05$ in the both groups). In CABG operation because of oxidative stress and consumption of GSH (Reduced Glutathione) immediate reduction in the plasma levels of homocyteine occurs in the both techniques. However using off pump CABG induction of oxidative stress and changes in plasma levels of homocysteine are not as high as on- pump CABG.*

Conclusion: *The on-pump technique was correlated with a faster decrease in the homocysteine level during the first 12 hours and with a faster and higher elevation of the homocysteine concentration 12-48 hours postoperatively.*

Keywords:

Oxidative stress ، Homocyteine ، On-pump CABG ، Off-pump CABG

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