Study on NO Radicals Generated from Ischemia-reperfusion Heart

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Using Hemoglobin (Hb), $(DETC)_2Fe^{2+}NO$ and $(MGD)Fe^{2+}$as spin trapping,the NO free radicals generated from ischemia-reperfused heart in vitro and in vivo were detected and the scavenging of Chinese medicine chinonin and EGb were studied. It was found that NO could be detected from ischemia-reperfused heart by the spin trapping agents and this signal increased with the injection of L-arginine and decreased with the inhibitor of NO synthase. The kinetic of oxygen and NO free radicals generated from ischemia-reperfusin heart and their scavenging effect by chinonin were studied. It was found that after 20 minutes ischemia, the first oxygen free radical peak appeared at about 0.5 minutes after the beginning of reperfusion. Then the release of oxygen free radicals decreased with time. The second peak appeared at about 3 minutes. Similarly, there were two peaks of creatine kinase (CK) release, which indicated the myocardial damage, the first one appeared concomitantly with the first oxygen free radical peak but the second one appeared later about I minute after the second peak of oxygen free radicals. The release of NO free radicals was increased significantly in the presence of L-arginine and it also had biphase profile. It could protect the ischemia-reperfusion damage in the presence of low concentration of L-arginine (0.1mM), but in high L-arginine concentration (10mM) it generated higher concentrations of NO leading to a more serious ischemia-reperfusion damage. Addition of chinonin could scavenge the free radicals and protect the ischemia-reperfusion injury especially in the second phase.