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EFFECTS OF INFLAMMATION, OXIDATIVE STRESS AND PLATELET ACTIVATION ON CORONARY HEART DISEASE AND THEIR INTERACTIONS

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Objectives To investigate changes in inflammation, oxidative stress and platelets in patients with coronary heart disease (CHD) and the relationship among them by determining the levels of inflammatory markers, product of oxidative stress and platelet activation.

Methods 67 CHD patients (48 males and 19 females) were selected, with an average age of (60.0±11.8) years old, of them, 14 stable angina pectoris (SAP), 25 unstable angina pectoris (UAP) and 28 acute myocardial infarction (AMI) patients. 20 patients with PSVT were selected as controls. Their serum high sensitivity C-reactive protein (hs-CRP), plasma malondialdehyde (MDA) and P-selectin levels were determined, and their relationships analysed.

Results

1. The hs-CRP level in patients with SAP group ((1.57±1.15) mg/l), UAP group ((3.80±3.39) mg/l) and AMI group ((9.61 ±4.22) mg/l) were markedly higher than those in the control group ((0.84±0.96) mg/l). Compared to the control group, the concentration of hs-CRP in SAP group had no significant difference; The hs-CRP in UAP group was significantly different from the control group ($p<0.01$) and SAP group ($p<0.05$). The hs-CRP in AMI group was significantly different from the control group ($p<0.01$), SAP group ($p<0.01$) and UAP group ($p<0.01$).
2. The plasma concentration of MDA in patients with SAP group ((9.66±2.08) μM), UAP group ((13.31±3.01) μM) and AMI group ((15.44±4.55) μM) were markedly higher than those in the control group ((7.11±4.67) μM). Compared to the control group, the concentration of MDA in SAP group had no significant difference; The MDA in UAP group was significantly different from the control group ($p<0.01$) and SAP group ($p<0.01$). The MDA in AMI group was significantly different from the control group ($p<0.01$) and SAP group ($p<0.01$), but not significantly different from UAP group.
3. The plasma concentration of P-selectin in patients with SAP group ((117.84±51.86) ng/ml), UAP group ((160.61±59.36) ng/ml) and AMI group ((168.82±60.84) ng/ml) were markedly higher than those in the control group ((92.91±44.74) ng/ml). Compared to the control group, the concentration of P-selectin in SAP group had no significant difference; The P-selectin in UAP group was significantly different from the control group ($p<0.01$) and SAP ($p<0.05$). The P-selectin of AMI is significantly different from the control group ($p<0.01$) and SAP group ($p<0.01$), but not significantly different from UAP group.
4. The correlation analysis showed that P-selectin was significantly and positively correlated with hs-CRP ($r=0.603$, $p<0.01$) and MDA ($r=0.693$, $p<0.01$). Hs-CRP also had positive correlations with MDA ($r=0.667$, $p<0.01$).

Conclusions

1. The concentration of hs-CRP, MDA and P-selectin in patients with CHD were markedly higher than those in the control group, and were increased from the stable angina group to unstable angina group and acute myocardial infarction group. Accordingly, Inflammatory response, oxidative stress and platelet activation were closely associated with the stability of atheromatous plaque, and the clinical manifestation.
2. P-selectin, MDA and hs-CRP were significantly and positively correlated with each other which demonstrate that together the interactions of inflammation, oxidative stress and platelet activation lead to the occurrence and development of CHD.