The effect on vascular endothelial growth factor and C-reactive protein levels before and after coronary intervention treatment of coronary heart disease

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Abstract: Objective: To investigate the changes in the vascular endothelial growth factor (VEGF) and C-reactive protein (CRP) levels before and after percutaneous coronary intervention treatment. **Methods:** 87 cases of coronary heart disease were treated with percutaneous transluminal coronary angioplasty (PTCA) and stent implantation in The Central Hospital of Cangzhou, Hebei Province from March 2011 to November 2012. CRP and VEGF changes were determined during the interventional Therapy. **Results:** Among 102 patients, the group of 87 patients with a total placement stent, two cases of double vessel disease in patients with descending artery stenosis, no-reflow phenomenon in 2 patients which abandoned PTCA guidewire , the surgical success rate was 95.4% (83 / 87). CRP and VEGF levels stent implantation done immediately after than before surgery (P <0.05), and 24 hours at peak below preoperative levels after one month, the difference was statistically significant (P <0.05). **Conclusion:** PTCA compared with preoperative CRP and VEGF levels increased, its variation may reflect the severity of coronary lesions and the degree of myocardial ischemia, monitoring of serum CRP and VEGF can understand the extent of the clinical therapeutic effects and inflammatory lesions.

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In recent years, studies have shown that [1] the development of the inflammatory response in coronary heart disease is closely related to the vascular endothelial growth factor (vascular endothelial growthfactor, VEGF)-specific angiogenic factors have been discovered in recent years, its level may reflect the degree of myocardial ischemia, and is closely related with the severity of coronary lesions. C-reactive protein (C-reactive protein, CRP) is a typical acute phase response proteins, can objectively reflect the degree of granulocyte activation and inflammatory response. Percutaneous transluminal coronary angioplasty (PTCA) as a positive approach to the treatment of coronary heart disease, more and more sure of the medical profession [2]. PTCA, caused by myocardial reperfusion injury, coronary artery acute occlusion of coronary artery stenosis has become the major limiting factors affect of PTCA near term efficacy. The purpose of this study is to further investigate serum CRP and VEGF levels in the single coronary artery lesion stenting with short and long term cardiovascular events and re-stenosis relationship.

1. Materials and Methods

1.1 Clinical data: Hebei Cangzhou Central Hospital from March 2011 to November 2012 , 87 cases selected required percutaneous transluminal coronary angioplasty (PTCA) and stent implantation in patients with coronary heart disease, the single branch coronal artery disease (coronary angiography confirmed coronary artery diameter stenosis ≥ 75%), 47 cases were male and 40 females, aged 47 to 79 years, an average of (55.5 ± 7.5) years. 34 cases of patients with stable angina pectoris, 53 cases of unstable angina and myocardial infarction. Exclude intervention before and after treatment observation period of acute inflammatory diseases of other systems.

1.2 Methods: All patients with stent placement three days before aspirin 300mg / day clopidogrel 75mg / days, puncture femoral artery Judkin's Law to establish pathways, respectively, before and after stenting contrast, by the computer quantitative angiography analysis software calculate the minimum diameter of the blood vessels, percentage of stenosis, contrast agents are used Ultravist 370, left and right coronary conditions, multi-position projection to determine the extent, scope and type of coronary lesions after surgery with arterial sheath send care unit given ECG. Intraoperative intravenous heparin 10 O00U; postoperative low molecular weight heparin 0.4 ml of 2 times / day, 3 to 7 days of continuous use; clopidogrel 75mg / day, for 4 weeks; aspirin 100mg / day, long-term use. And fasting venous blood before surgery and 48h after early morning collection 2ml, placed in a sterile test tube, after centrifugation, serum was kept under test. Serum CRP concentrations were

measured using turbidimetric method, Shanghai Ming Wah in vitro diagnostic reagents kit instrument for Hitachi automatic analyzer; Serum VEGF was measured by ELISA method for the determination of the double antibody sandwich ABC Kit by Hysen Hung Technology Industrial Co., Ltd. provided with Italy Xiya Ke the company's ALISAI ELISA automatic analysis system, the value of A is measured at 792 nm.

1.3 statistical methods of data processed by the SPSS 10.0 statistical package. Measurement data to mean plus or minus standard deviation (X ± s) own preoperative and postoperative control paired t test. Set inspection level a = 0.05.

2 Results

2.1 surgical results: The group of 87 patients with a total placement bracket 102 All successful stent placed in the target vessel lesion; There are two cases of double vessel disease in patients with PTCA guidewire can not give up descending artery stenosis, 2 cases patients with no-reflow phenomenon, the procedural success rate was 95.4% (83/87). Postoperative follow-up, four patients a month angina attack, the pain was mild, sublingual nitroglycerin effectively. The rest of the patients during the 3-month follow-up there was no angina and myocardial infarction.

2.2 PCI perioperative changes in CRP and VEGF: CRP and VEGF levels stent implantation done immediately after than before the preoperative (P <0.05), a 24-hour reached a peak after a month lower than thatlevel, the difference was statistically significant (P <0.05) (Illustrated in Table1).

Table 1. Comparison of clinical efficacy

Time	CRP(mg/L)	VEGF(pg/ml)
Preoperative	7.36±2.31	279.18±63.76
Immediate postoperative	9.14±3.03	308.41±62.56
Postoperative 24h	16.03±3.81	133.83±45.44
Postoperative1 month	6.11±2.05	125.31±29.59

3. Discussion

CRP is recognized as a one of the most sensitive marker of non-specific inflammation of the body, mainly induced by cytokines (such as interleukin-6), the liver cells. In the case of the exclusion of other factors (such as a variety of acute and chronic inflammation, autoimmune diseases, diabetes, malignancies, myocarditis, cardiomyopathy, etc.) of CRP increased level of CRP levels may reflect the strength of the inflammatory response in coronary lesions [3]. This study found that postoperative CRP level may stimulate postoperative stent plaque, intimal injury, plaque rupture and local inflammatory reaction intensified due to prompt to strengthen the intervention of the inflammatory response after PCI, possible future become an important means of preventing restenosis. VEGF is 1989 a peptide isolated from cultured bovine pituitary follicular stellate cells with specificity promote vascular endothelial cell proliferation division to promote the formation of new blood vessels and collateral circulation. Main factors to stimulate VEGF secretion ischemia and hypoxia, stretch, inflammatory cytokines, but the most important of ischemia and hypoxia. Experiments confirmed [4], in a variety of animal model of myocardial ischemia or limb ischemia import VEGF protein or gene can promote the formation of collateral circulation. This group of patients after successful interventional treatment of coronary artery stenosis lift CRP levels and VEGF levels decreased rapidly, prompt preoperative ischemia can induce elevated CRP and VEGF PCI intraoperative regional myocardial ischemia rapidly relieve, reduce endothelial cells on CRP and VEGF release. To ensure the success of the surgery, reduce complications, I think we should pay attention to the following aspects: (1) the appropriate choice of the balloon, give appropriate pressure to select the appropriate diameter of the stent at the same time, to ensure the full expansion of the stent is released close to the blood vessel wall; (2) simple PTCA higher rate of restenosis seriously affect the long-term efficacy of coronary stent applications quickly restore the integrity of the intimal maintain blood flow to provide a more reliable guarantee [5-6], reduce restenosis and the incidence of acute coronary events; (3) direct coronary stent does not pre-expansion of vascular lesions, vascular damage, to reduce coronary dissection and restenosis opportunities advantages in clinical work, accurately the indications, to pay more to carry out, in order to shorten the operation time, reduce the cost of surgery.

References

1 Shuguang Li, Wei Hu. C-reactive protein changes before and after coronary artery disease undergoing percutaneous coronary intervention therapy clinical analysis. Of clinical medicine .2009,29 (7) :3-4

2 Tataru MC, Heirich J, JunkerR, et a1.0reaction protein and severity of atheros clerosis in myocardial infarction patients with stable angina pectoris. Eur Heart J, 2000,21 (12): 1000

3 COOK N R, BURING J E, RIDKER P M. The effect of including C-reactive protein in cardiovascular risk prediction models for women. Ann Intern Med, 2006,145:27 29.

4 Weihua Li, Lei Gao, Kaimin Lin. Coronary intervention in patients with coronary heart disease, interleukin-18 and high-sensitivity C-reactive protein. Journal of Clinical Cardiology, 2007,23 (11) :871-873.

5 Chenshu, Hu Hesheng. Coronary intervention in patients with unstable angina treatment and clinical significance of QT dispersion. Journal of Clinical Medicine. 2004,8 (3): 81.

6 Chuan-mu Liu, Mingzhe Zhang, Kun Tianming, et al. Coronary stent clinical observation of treatment of 103 cases of coronary heart disease. Interventional cardiology magazine, 2001,9 (2): 63.

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