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## hs-CRP、D-二聚体和 Lp-PLA2 与冠心病患者冠状动脉粥样硬化易损斑块的相关性

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**摘要 目的:**研究超敏 C 反应蛋白(hs-CRP)、D-二聚体和脂蛋白相关磷脂酶 A2(Lp-PLA2)与冠心病患者冠状动脉粥样硬化易损斑块的相关性。**方法:**选择 2014 年 1 月~2016 年 12 月在我院进行冠状动脉造影和血管内超声检查的患者 106 例,按照检查结果分为易损斑块组、稳定斑块组和对照组。检测和比较三组患者的血清 hs-CRP、D-二聚体和 Lp-PLA2 水平,并采用 Pearson 相关分析探讨其与纤维帽厚度、斑块偏心指数和血管重构指数的相关性。**结果:**易损斑块组和稳定斑块组的血清 hs-CRP、D-二聚体和 Lp-PLA2 水平明显高于对照组( $P<0.05$ ),且易损斑块组的血清 hs-CRP、D-二聚体和 Lp-PLA2 水平明显高于稳定斑块组( $P<0.05$ )。hs-CRP 与纤维帽厚度呈负相关( $r=-0.712, P<0.05$ ),与斑块偏心指数和血管重构指数呈正相关( $r=0.813, 0.756, P<0.05$ );D-二聚体与纤维帽厚度呈负相关( $r=-0.654, P<0.05$ ),与斑块偏心指数和血管重构指数呈正相关( $r=0.912, 0.853, P<0.05$ );Lp-PLA2 与纤维帽厚度呈负相关( $r=-0.796, P<0.05$ ),与斑块偏心指数和血管重构指数呈正相关( $r=0.836, 0.729, P<0.05$ )。**结论:**hs-CRP、D-二聚体和 Lp-PLA2 与冠心病患者冠状动脉粥样硬化易损斑块具有较高的相关性,可作为评估冠状动脉粥样斑块不稳定性的参考指标。

**关键词:**超敏 C 反应蛋白;D-二聚体;脂蛋白相关磷脂酶;冠心病

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## Correlation of Serum Hs-CRP, D-dimmer and Lp-PLA2 Levels with Vulnerable Plaque of Coronary Artery Atherosclerosis in Patients with Coronary Heart Disease

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**ABSTRACT Objective:** To investigate the correlation of serum hs-CRP, D- dimmer and Lp-PLA2 with vulnerable plaque of coronary artery atherosclerosis in patients with coronary heart disease. **Methods:** Selected 106 cases of patients in our hospital from January 2014 to December 2015, all taken coronary angiography and intravascular ultrasound. Divided into three groups according to the results of the examination, the levels of serum hs-CRP, D- dimmer and Lp-PLA2 were examined and compared, and the correlation with fiber cap thickness, plaque eccentricity index, and vascular remodeling index were tested by Pearson correlation analysis. **Results:** Serum levels of hs-CRP, D- dimmer and Lp-PLA2 of vulnerable plaque group and stable plaque group were significantly higher than that of the control group ( $P<0.05$ ), and the serum levels of hs-CRP, D- dimmer and Lp-PLA2 of vulnerable plaque group were significantly higher than that of stable plaque group ( $P<0.05$ ); hs-CRP was negative correlated with the thickness of fibrous cap ( $r=-0.712, P<0.05$ ), and positive correlated with eccentric plaque index and vascular remodeling index ( $r=0.813, 0.756; D-, P<0.05$ ), D- dimmer was negative correlated with the thickness of fibrous cap ( $r=-0.654, P<0.05$ ), and positive correlated with eccentric plaque index and vascular remodeling index ( $r=0.912, 0.853, P<0.05$ ); Lp-PLA2 was negative correlated with the thickness of fibrous cap ( $r=-0.796, P<0.05$ ), and positive correlated with eccentric plaque index and vascular remodeling index ( $r=0.836, 0.729, P<0.05$ ). **Conclusion:** Hs-CRP, D-dimmer and Lp-PLA2 have high correlation with vulnerable plaque in coronary artery disease, can be used as reference indexes for assessing the instability of coronary atherosclerotic plaque.

**Key words:** Hs-CRP; D-dimmer; Lp-PLA2; Coronary heart disease

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## 前言

冠心病是一种临床上常见的由于冠状动脉粥样硬化而导致的冠状动脉病变<sup>[1,2]</sup>。研究显示炎症反应和冠状动脉粥样硬化的形成之间关系紧密<sup>[3]</sup>。超敏 C 反应蛋白(hs-CRP)、D- 二聚体和脂蛋白相关磷脂酶 A2(Lp-PLA2)均为临床判断机体有无发生炎症反应的重要指标<sup>[4,5]</sup>,但其与冠心病患者冠状动脉粥样硬化斑块稳定性相关性尚不明确。因此,本研究探讨对 hs-CRP、D- 二聚体和 Lp-PLA2 与冠心病患者冠状动脉粥样硬化易损斑块的相关性,现报道如下。

## 1 资料和方法

### 1.1 一般资料

选择 2014 年 1 月~2016 年 12 月在我院进行冠状动脉造影和血管内超声检查的患者 106 例,按照检查的结果分为易损斑块组、稳定斑块组和对照组。易损斑块组 35 例,冠状动脉造影检查发现一处或多处血栓和斑块破裂,并且血管内超声检查发现斑块偏心指数 >0.5,斑块出现破裂、糜烂及溃疡;男 19 例,女 16 例;年龄 61~83 岁,平均(72.36± 2.13)岁。稳定斑块组 51 例,冠状动脉造影检查发现病变狭窄处 ≤70%,并且血管内超声检查发现斑块并无偏心和破裂;男 28 例,女 23 例;年龄 60~82 岁,平均(71.42± 1.93)岁。对照组 20 例,冠状动脉造影和

血管内超声检查均为阴性;男 11 例,女 9 例;年龄 6~83 岁,平均(70.46± 2.54)岁。本研究获得我院伦理委员会的批准,所有患者均签署知情同意书。三组的基线资料具有可比性。

### 1.2 研究方法

所有研究对象均于清晨空腹采集 5 mL 静脉血,采用北京奥普森 AMS-300 全自动生化分析仪检测血清 hs-CRP 水平;采用赛默飞 Varioskan LUX 多功能微孔板读数仪检测血清 Lp-PLA2 水平;采用贝克曼 ACL7000 全自动凝血分析仪检测血清 D- 二聚体水平;采用 Pearson 相关性分析对其相关性进行检验。

### 1.3 统计学分析

采用 SPSS15.00 软件,计量资料以  $\bar{x} \pm s$  表示,组间对比用 t 检验,采用 Pearson 相关性分析对其相关性进行检验,以 P<0.05 表示差异有统计学意义。

## 2 结果

### 2.1 三组血清 hs-CRP、D- 二聚体和 Lp-PLA2 水平的比较

易损斑块组和稳定斑块组的血清 hs-CRP、D- 二聚体和 Lp-PLA2 水平明显高于对照组(P<0.05),且易损斑块组的血清 hs-CRP、D- 二聚体和 Lp-PLA2 水平明显高于稳定斑块组(P<0.05),见表 1。

表 1 三组血清 hs-CRP、D- 二聚体和 Lp-PLA2 水平对比( $\bar{x} \pm s$ )

Table 1 Comparison of the serum levels of hs-CRP, D- dimer and Lp-PLA2 between three groups( $\bar{x} \pm s$ )

| Groups                  | n  | hs-CRP( $\mu\text{g/L}$ ) | D-dimer ( $\mu\text{g/L}$ ) | Lp-PLA2( $\mu\text{g/L}$ ) |
|-------------------------|----|---------------------------|-----------------------------|----------------------------|
| Control group           | 20 | 4.32± 0.87                | 63.12± 25.18                | 126.79± 11.46              |
| Stable plaque group     | 51 | 6.58± 1.12*               | 129.76± 29.38*              | 325.89± 23.74*             |
| Vulnerable plaque group | 35 | 13.96± 2.33**             | 296.42± 33.17**             | 393.82± 25.13**            |

Note: Compared with control group, \*P<0.05; compared with stable plaque group, \*\*P<0.05.

### 2.2 相关性分析

以易损斑块组和稳定斑块组的斑块偏心指数、纤维帽厚度和血管重构指数为因变量,以血清 hs-CRP、D- 二聚体和 Lp-PLA2 为自变量,Pearson 相关性分析显示血清 hs-CRP 水平与纤维帽厚度呈显著负相关( $r=-0.712, P<0.05$ ),与斑块偏心指数和血管重构指数呈显著正相关( $r=0.813, 0.756, P<0.05$ );血清 D- 二聚体水平与纤维帽厚度呈显著负相关( $r=-0.654, P<0.05$ ),与斑块偏心指数和血管重构指数呈显著正相关( $r=0.912, 0.853, P<0.05$ );血清 Lp-PLA2 水平与纤维帽厚度呈显著负相关( $r=-0.796, P<0.05$ ),与斑块偏心指数和血管重构指数呈显著正相关( $r=0.836, 0.729, P<0.05$ )。

## 3 讨论

冠心病是临床最为常见的一种慢性心血管疾病,主要由血管慢性炎症硬化斑块的形成所致<sup>[6,7]</sup>。近年来的研究表明炎症介质参与了动脉粥样硬化的形成全过程,炎症反应和冠心病的发生、发展和预后之间有着紧密的相关性<sup>[8-10]</sup>。hs-CRP 是急性时相反应蛋白,当组织受损后,在白介素-1 $\beta$  和白介素-6 等炎症细胞因子的诱导下迅速产生,并且 hs-CRP 水平升高的程度和阻

止发生炎症反应的程度之间呈正比<sup>[11,12]</sup>。盖丽<sup>[13]</sup>等的研究表明 hs-CRP 水平与急性冠状动脉综合症的病变程度呈正相关,稳定型心绞痛患者的 hs-CRP 水平显著低于不稳定型心绞痛患者,并且不稳定型心绞痛患者的 hs-CRP 水平显著低于急性心肌梗死患者。D- 二聚体水平升高则提示纤溶的发生和纤维蛋白血栓的形成,可作为临床判断机体纤溶亢进、凝血状态和血栓形成的一种生物标志物<sup>[14-16]</sup>。Lp-PLA2 作为一种临床常见的血管特异性的炎症标志物,主要由 T 细胞、巨噬细胞和肥大细胞分泌,能诱发血栓和血管内皮损伤,也是引起缺血性脑卒中和冠心病的独立风险因素<sup>[17-19]</sup>。

本研究结果显示易损斑块组和稳定斑块组的血清 hs-CRP、D- 二聚体和 Lp-PLA2 水平明显高于对照组,且易损斑块组的血清 hs-CRP、D- 二聚体和 Lp-PLA2 水平明显高于稳定斑块组,提示 hs-CRP、D- 二聚体和 Lp-PLA2 与冠心病患者冠状动脉粥样硬化斑块稳定性有一定的相关性。易损斑块具有纤维帽厚度较薄的特征,斑块偏心指数越高斑块偏心程度越严重,血管重构指数小于 1.05 表明血管无重构或负性重构,超过 1.05 表明血管 1 正性重构<sup>[20]</sup>。本研究结果显示 hs-CRP、D- 二聚

体和 Lp-PLA2 均与纤维帽厚度呈明显负相关( $P<0.05$ ), 与斑块偏心指数和血管重构指数呈明显正相关, 证实 hs-CRP、D-二聚体和 Lp-PLA2 与动脉粥样硬化易损斑块之间存在相关性, 具有一定的临床应用价值。

综上所述, hs-CRP、D-二聚体和 Lp-PLA2 与冠心病患者冠状动脉粥样硬化易损斑块具有较高的相关性, 可作为评估冠状动脉粥样斑块不稳定性的参考指标。

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