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### ASSOCIATION OF THE SERUM LEVELS OF C-REACTIVE PROTEIN WITH ITS GENE POLYMORPHISMS AND ACUTE CORONARY SYNDROME

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**Objectives** To investigate the association of the serum levels of CRP with its gene polymorphisms and the risk of ACS in Chinese Han population in Sunan region.

#### Methods

1. All the patients enrolled in this study were hospitalised in the cardiovascular department of affiliated Wu Jin Hospital of Jiangsu University during the period from July 2007 to December 2011, including 443 patients with ACS (ACS group) and 225 control subjects who were free from CAD (control group). ACS group was subgrouped into AMI, UAP male ACS, female ACS, elderly ACS, premature ACS, male AMI, female AMI, elderly AMI, premature AMI, male UAP, female UAP, elderly UAP and premature UAP according to ACS type, gender and age stage. Clinical data such as gender, age, history of smoking, hypertension and diabetes mellitus, and plasma lipids level were recorded. The CRP gene T-757C and C+1444T polymorphisms were determined by PCR-restriction fragment length polymorphism analysis. The serum CRP level was measured by ELISA. Statistical analysis was performed with SPSS 17.0 software.

#### Results

1. There were CRP gene T-757C and C+1444T polymorphisms in Chinese Han population in Sunan region.
2. The serum CRP level and its correlation with risk of ACS:

2.1 The comparison of the serum CRP levels between ACS/AMI/UAP patient and the controls. The serum CRP levels in ACS, AMI and UAP patients were (8.220/8.166, 8.220/7.119 and 8.269/9.179  $\mu\text{g/ml}$ , respectively) significantly were higher than those in the controls (3.584/2.277  $\mu\text{g/ml}$ ) (all p values less than 0.001), and the serum CRP levels had no significant difference between AMI and UAP patients (all p value greater than 0.05); after adjusting for traditional CAD risk factors such as age, history of smoking, hypertension and diabetes, and dyslipidemia by the Logistic regression analysis, there was significant correlation of the serum CRP levels with the risk of ACS/AMI/UAP [(all p values less than 0.001, OR (95% CI) were 4.418 (2.728–7.157), 4.379 (2.578–7.439) and 5.145 (2.963–8.935, respectively)].

2.2 The comparison of the serum CRP levels between ACS/AMI/UAP patients carrying the same genotype and the corresponding controls. As comparison with those in the corresponding controls, the serum CRP levels were significantly higher in ACS/AMI/UAP patients carrying the same genotype in T-757C (all p values less than 0.001) and C+1444T (all p values less than 0.05) locus; Logistic regression analysis showed that there was significant correlation of the serum CRP levels with the risk of ACS/AMI/UAP (all p values less than 0.05).

2.3 The comparison of the serum CRP levels between ACS/AMI/UAP patients carrying the same genotype with the same gender and age stage and the corresponding controls.

2.3.1 T-757C As comparison with those in the corresponding controls, the serum CRP levels were significantly higher in ACS/AMI/UAP patients with the same gender and age stage carrying the same genotype in T-757C locus (all p values less than 0.05) except for female UAP and premature ACS/AMI/UAP patients with small sample carrying (CC+TC) genotype; Logistic regression analysis showed that there was significant correlation of the serum CRP levels with the risk of ACS/AMI/UAP carrying TT genotype and female ACS/AMI or elderly ACS/AMI/UAP carrying (CC+TC) genotype in T-757C locus with the same gender and age stage (all p values less than 0.05).

2.3.2 C+1444T As comparison with those in the corresponding controls, the serum CRP levels were significantly higher in ACS/AMI/UAP patients with the same gender and age stage carrying the same genotype in C+1444T locus (all p values less than 0.05) except for female and premature ACS/AMI/UAP patients with small sample carrying CT genotype; Logistic regression analysis showed that there was significant correlation of the serum CRP levels with the risk of ACS/AMI/UAP carrying CC genotype and

male ACS/UAP or elderly ACS/AMI/UAP carrying the CT genotype in C+1444T locus with the same gender and age stage (all p values less than 0.05).

### 3. Association of the serum CRP levels with the CRP gene polymorphisms

#### 3.1 The serum CRP levels with the CRP gene T-757C polymorphism

##### 3.2.1 ACS/AMI/UAP/control group

There was no significant difference of the serum CRP levels between TT and (CC+TC) genotype in ACS/AMI/UAP/control group (7.244/9.076  $\mu\text{g/ml}$  vs 8.601/8.009  $\mu\text{g/ml}$ , 7.446/8.184  $\mu\text{g/ml}$  vs 8.369/7.157  $\mu\text{g/ml}$ , 6.980/9.617  $\mu\text{g/ml}$  vs 8.869/9.188  $\mu\text{g/ml}$  and 3.567/2.979  $\mu\text{g/ml}$  vs 3.642/2.209  $\mu\text{g/ml}$ , respectively) (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene T-757C polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis (all p value greater than 0.05).

##### 3.2.2 ACS/AMI/UAP/control group with the same gender and age stage

There was no significant difference of the serum CRP levels between TT and (CC+TC) genotype in ACS/AMI/UAP/control group with the same gender and age stage (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene T-757C polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis with the same gender and age stage (all p value greater than 0.05).

#### 3.2 The serum CRP levels with the CRP gene C+1444T polymorphism

##### 3.2.1 ACS/AMI/UAP/control group

There was no significant difference of the serum CRP levels between CC and CT genotype in ACS/AMI/UAP/control group (8.148/8.287  $\mu\text{g/ml}$  vs 8.550/6.797  $\mu\text{g/ml}$ , 8.220/7.262  $\mu\text{g/ml}$  vs 8.095/8.433  $\mu\text{g/ml}$ , 8.075/9.432  $\mu\text{g/ml}$  vs 8.550/7.241  $\mu\text{g/ml}$  and 3.590/2.490  $\mu\text{g/ml}$  vs 3.559/2.127  $\mu\text{g/ml}$ , respectively) (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene C+1444T polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis (all p value greater than 0.05).

##### 3.2.2 ACS/AMI/UAP/control group with the same gender and age stage

There was no significant difference of the serum CRP levels between CC and CT genotype in ACS/AMI/UAP/control group with the same gender and age stage (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene C+1444T polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis with the same gender and age stage (all p value greater than 0.05).

**Conclusions** In Chinese Han population in Sunan region, elevated serum CRP levels is relevant to risk of ACS/AMI/UAP. There are no associations of the serum CRP levels with the CRP gene T-757C and C+1444T polymorphisms in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis of any gender and age stage.