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Relationship between premature ventricular contractions and serum TNF-α, IL-6 level in patients

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Abstract: ***Objective****: To investigate the relationship between premature ventricular contractions and serum TNF-α, IL-6 level.* ***Methods****: From December 2020 to April 2021, 35 patients with premature ventricular contractions of coronary heart disease with deficiency of both qi and Yin in our hospital were selected as the observation group, and 41 healthy people in the same period were selected as the control group. Serum samples were collected from the observation group and the control group, The expression levels of TNF-α, IL-6 in serum were detected by ELISA; Objective to evaluate the relationship between lown classification of ventricular premature beat and TCM symptom score of patients with coronary heart disease of Qi and yin deficiency type; The relationship were measured between serum TNF-α, IL-6 level and lown grade of ventricular premature beat in the observation group.* ***Results****: Compared with the control group, the levels of serum TNF-α, IL-6 in the observation group were significantly higher; With the improvement of lown classification of ventricular premature beat, TCM symptom score and the levels of serum TNF-α, IL-6 are increased step by step.* ***Conclusion****: The relationship between premature ventricular contractions and serum TNF-α, IL-6 in patients with coronary heart disease of Qi Yin deficiency type may provide some theoretical value for clinical treatment.*

Keywords: *Deficiency of both qi and Yin, Ventricular Extrasystole of Coronary Heart Disease, TNF-α, IL-6*

1. Introduction

Coronary heart disease (CHD) is one of the most common cardiovascular diseases, which is caused by cardiovascular blockage caused by atherosclerosis of coronary arteries and leads to myocardial ischemia and hypoxia. Premature ventricular beat is one of the common complications of coronary heart disease, and arrhythmia in severe patients can aggravate the disease and may lead to sudden death [1]. In recent years, studies have shown that some patients with ventricular premature beat cardiac muscle biopsies found that the existence of myocardial inflammation, inflammatory factor levels associated with arrhythmia with linear relation, inflammatory cytokines may change by influencing the myocardial membrane potential, cause cardiac electrophysiological remodeling, sympathetic to the vagus nerve imbalances, myocardial ischemia and ischemia, so as to induce arrhythmia [2]. It has been pointed out in literatures that the levels of inflammatory factors and the pathogenesis of arrhythmia are highly expressed, such as tumor necrosis factor (TNF-α) and interleukin-6 (IL-6) [3]. Increased TNF-α level can lead to structural and membrane potential remodeling of myocardium, and induce IL-6 expression, leading to cell membrane damage and arrhythmia [4]. Premature ventricular beat of coronary heart disease belongs to the categories of "chest obstruction", "palpitation" and "pulse generation" in Chinese medicine. In recent years, some scholars have pointed out that the TCM syndromes of premature ventricular contractations are mainly deficiency syndrome, accounting for 53.62% of the total, among which the deficiency syndrome of qi and Yin is the most common, accounting for 37.68% of the total [5]. Therefore, this study will explore the correlation between premature ventricular beats and serum levels of inflammatory factors TNF-αand IL-6 in CHD with deficiency of qi and Yin.

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2. Data and methods

2.1 General Information

From December 2020 to April 2021, 35 patients with premature ventricular beat of coronary heart disease with deficiency of qi and Yin were selected as the observation group, including 14 males and 21 females. The average age was (58.9±16.14) years from 26 to 80 years. The diagnosis of western medicine with the Chinese medical association in 2007 issued by the diagnosis and treatment of chronic stable angina guide [6] and 2020 ventricular arrhythmia China expert consensus [7] palpitations belongs to qi and Yin deficiency syndrome diagnostic criteria with reference to the Chinese medicine science and technology press, the Chinese medicine new medicine clinical research guiding principle (2002) "[8] and the release of China association of Chinese medicine" Guidelines for diagnosis and Treatment of Premature ventricular contractions in Chinese Medicine (ZYYXH/T65-2008) [9]. Inclusion criteria:(1) patients who met the diagnostic criteria of chronic coronary syndrome stable angina type a-d and asymptomatic type; (2) The patients met the diagnostic criteria of arrhythmia and the Lown grade of premature ventricular beat was 1-4A; (3) those who have not received radiofrequency ablation; (4) Voluntarily participate in the experiment and sign the informed consent. Exclusion criteria :(1) persons with mental disorders; (2) pregnant or lactating women, allergic constitution and allergic to multiple drugs; (3) Digitalis poisoning, electrolyte disorder and acid-base imbalance caused ventricular arrhythmia; (4) hepatic and renal insufficiency or critical and multiple organ failure complicated with ventricular arrhythmia; (5) patients with significant bradycardia (including pathological sinus syndrome and atrioventricular block ii or above); (6) The presence of other correlational organ lesions. Forty-one healthy subjects were selected as the control group, including 14 males and 27 females. Age ranged from 24 to 72 years, with an average of (46.56±12.21) years. There was no significant difference in age between 2 groups ($P > 0.05$), indicating comparability.

2.2 Methods

2.2.1 Collection of serum specimens

In the morning, 3mL of fasting peripheral venous blood was extracted from patients with premature ventricular contractions of coronary heart disease with deficiency of qi and Yin and healthy subjects in the resting state. The blood was placed in a sterile dry test tube, centrifuged at 3500r/min for 10min at 4℃, and 0.3-0.4ml of upper serum was absorbed into sterile cryostorage tube. Mark the serial number and put it in the -80℃ refrigerator for later use.

2.2.2 SERUM TNF-α and IL-6 levels were detected by ELISA

All the ELISA kits used were produced by Shanghai Enzyme-linked Biology Co., LTD., and the ELISA instrument was used (American MD). The samples to be examined were removed from the refrigerator and placed at room temperature for 1h. Serum TNF-α and IL-6 levels were detected by ELISA, and the test method was carried out according to the kit instructions. The absorbance value was measured at 450nm wavelength with a microplate reader. The standard curve was drawn based on the absorbance result of standard solution and the concentration of standard solution, and the conversion equation was obtained to calculate the levels of TNF-α and IL-6.

2.2.3 TCM Symptom score score

The graded integral method was adopted, and the quantitative standard of symptom grading was adopted (refer to the Chinese Medicine Industry Standard of the People's Republic of China - Diagnosis and Efficacy Standard of TCM Symptoms) [10]

2.3 Statistical Treatment

SPSS 19.0 statistical software was used for analysis. Measurement data were expressed as $X \pm S$, and t test was adopted. $P < 0.05$ was considered statistically significant.

3. THE results

1) Serum LEVELS of TNF-αand IL-6 in the two groups were significantly higher than those in the control group ($P < 0.05$), as shown in Table 1.

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2) TCM symptom score of palpitation patients with qi and Yin deficiency was positively correlated with Lown grading of PVCS, as shown in Table 2.

3) Serum LEVELS of TNF-α and IL-6 increased with Lown grading of PVCS, as shown in Table 3.

Table 1: Comparison of serum TNF-αand IL-6 levels between the two groups (X±S)

group	n	TNF-α (pg/mL)	IL-6 (pg/mL)
The control group	41	55.78±10.01	35.13±8.06
Observation group	35	60.68±7.36	41.8±8.28
t		2.558	4.078
P		0.023	<0.001

Table 2: The TCM symptom score of patients with palpitation of qi and Yin deficiency was correlated with the Lown grading of PVCS

Lown classification of premature ventricular beats	Level 1	Level 2	Level 3	Level 4A
n	8	10	9	8
TCM Symptom Score	12.63±3.96	19.3±6.02	24.56±5.08	26.5±3.46

Table 3: Relationship between Lown grade and serum TNF-α and IL-6 levels in PVCS

Lown classification of premature ventricular beats	Level 1	Level 2	Level 3	Level 4A
n	8	10	9	8
TNF-α(pg/mL)	55.99±7.89	59.03±8.53	62.9±4.29	63.45±8.72
IL-6(pg/mL)	36.51±9.98	42.67±5.34	44.79±6.83	46.58±6.95

4. Conclusion

Premature ventricular beat of coronary heart disease belongs to the category of "chest obstruction" and "palpitation" in Traditional Chinese medicine. The author had the honor to follow the national famous old Chinese medicine professor Yang Zhen to learn the theory of phase fire machine. In short, in the human body, tRising fire is Jun fire, rising to a certain level and falling fire is phase fire. Jun fire runs with an emphasis on rising. Phase fire runs with a focus on falling. Taiyin lung main convergence fall, and phase fire with shaoyang bile fall and phase fire send. Drop in the kidney water to warm up the job, into both water and fire. Under abnormal conditions, if the phase fire rashly, it is transformed into a pathogenic factor. Therefore, Professor Yang Zhen believes that palpitation is treated from the heart. The pathogenesis of palpitation is always the deficiency of qi, blood and Yin and Yang, the displacement of the heart, the wild movement of the fire and the disturbance of the mind. In recent years, many scholars have explored the TCM diagnosis and treatment methods of premature ventricular beats in coronary heart disease with deficiency of qi and Yin [11-16], which is of great research significance.

Premature ventricular beat is a common arrhythmia in clinical practice. It refers to the location below the bifurcation of the heart's Hippodrome and the premature beating that can depole the ventricles in advance and is prone to repeated attacks. In patients with ischemic heart disease and various cardiac dysfunction, the incidence of premature ventricular beat is about 90%[17]. Serum IL-6 is a common inflammatory factor in cells, which can stimulate cells to produce inflammatory substances and aggravate inflammatory responses in arrhythmias [18]. Serum TNF-αis a pro-inflammatory factor, which is also closely related to the severity of patients with arrhythmia, and the increased level of TNF-α can accelerate the progression of patients with arrhythmia [19]. Il-6 induced by inflammatory factors can also lead to the activation of TNF-αand further aggravate the inflammatory response [20]. Therefore, it is necessary to study whether ventricular premature beats are correlated with serum TNF-αand IL-6 levels in coronary heart disease with deficiency of qi and Yin.

The results of this study showed that, compared with the control group, serum TNF-α and IL-6 were highly expressed in the observation group. With the increase of Lown grading grade of PVCS, TCM symptom score increased step by step, and serum TNF-αand IL-6 levels also increased.

In conclusion, the severity of PVCS in patients with CHD with qi-Yin deficiency may be correlated with serum inflammatory factors TNF-αand IL-6. However, the sample size in this paper is small, and clinical sample collection will be increased in subsequent studies to study the trend correlation between factors and TCM syndrome types of the disease.

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