

The impact on prognosis in QT dispersion changes in acute myocardial infarction patients after PCI

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Abstract: Objective To study after PCI QT dispersion (QTd) in patients with acute myocardial infarction (AMI) patients with prognostic relevance. **Methods** From 2010 December 1st to April 2012 patient were collected at the Sichuan Provincial People's Hospital for emergency PCI treatment of acute myocardial infarction in 32 patients within 6h after admission Judkin's method using selective coronary angiography and percutaneous coronary intervention (PCI); period with 11 cases of coronary angiography (CAG) results compared with normal (control group). Comparative analysis of preoperative and postoperative 24h, 2h standard twelve-lead simultaneous ECG QTd and follow-up the incidence of major cardiovascular events within 30 days (MACE) were all compared. Results: Compared with before treatment, PCI group after treatment, QTd was significantly shorter, the difference was statistically significant ($P < 0.01$); the control group before and after treatment showed no significant difference ($P > 0.05$); and control group, PCI group before treatment showed no significant difference ($P > 0.05$), PCI group after treatment QTd was significantly shorter, the difference was statistically significant ($P < 0.01$); All 32 patients underwent emergency PCI AMI QTd in patients with 23 cases of patients with shorter follow-up 30 days of cardiovascular events was 25% (8/32), QTd showed no significant change in 9 patients, the incidence of cardiovascular events was 77.8% (7/9), both were statistically significant ($P < 0.01$). **Conclusion** AMI patients QTd significantly higher than normal, successful PCI, AMI patients can significantly reduce the incidence of cardiovascular events QTd and; QTd and the degree of change can be used as evaluation of myocardial perfusion and recent prognostic indicators.

[Hong Kong. **The impact on prognosis in QT dispersion changes in acute myocardial infarction patients after PCI.** *Life Sci J* 2013; 10(2): 2420-2422]. (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 335

Key words: acute myocardial infarction; QT dispersion; incidence of cardiovascular events

QT dispersion (QT, d) refers to the lead surface ECG QT interval between the variation, it is time to evaluate cardiac repolarization space as an indicator of the degree of dispersion, on behalf of ventricular recovery time inconsistency degree of excitement over the QT interval better reflect the feelings of repolarization time difference. Numerous studies show that studies have shown that acute myocardial infarction (AMI) was significantly prolonged in patients with QTd, QTd early success after thrombolytic therapy reduced, so QTd AMI thrombolytic therapy can be used as an indicator when evaluated [1-3]. This study was to investigate the treatment of AMI patients undergoing PCI after emergency QTd changes and prognosis.

1 Materials and Methods

1.1 Clinical data selected from 2010 December 1 April 2012 at the Sichuan Provincial People's Hospital for emergency PCI treatment of acute myocardial infarction in 32 patients, including 24 males and 8 females, aged 34-68 years, mean age 43.6 years, based on the following criteria for the diagnosis of acute myocardial infarction: ① chest pain duration > 30min, sublingual nitroglycerin can relieve; ② newly issued two contiguous leads J point ST-segment elevation: V2_V3 leads men ≥ 0.2 mv, women ≥ 0.15 mv, and other leads ≥ 0.1 mv, a

dynamic evolution; ③ related coronary angiography showed coronary occlusion; ④ typical markers of myocardial injury and increased dynamic evolution. Inclusion criteria: first episode of myocardial infarction were; symptom onset to PCI, less than 12h; were CK, CK-MB and eTnT elevated; PCI treatment, epicardial infarct-related artery (IRA) have reached TIMI to flow grade 3; Exclusion criteria: All patients were excluded from electrolyte disturbances, left ventricular hypertrophy, intraventricular conduction block, atrial fibrillation, WPW syndrome, were not using anti-arrhythmic drugs. Select another year with chest pain, chest tightness, normal coronary angiography, 11 were used as the control group, including 7 males and 4 females, aged 34 to 68 years, with an average age of 45.1 years. The two groups in age, gender difference was not statistically significant ($P > 0.05$), comparable.

1.2 Treatment and Detection Methods All patients were admitted to hospital within 6h after using Judkin's method for selective coronary angiography. Coronary angiography showed that the infarct-related artery stenosis $\geq 75\%$ who carried out according to standard methods PCI treatment. Postoperative residual stenosis <10%, TIMI flow grade 3, and no acute coronary occlusion, malignant arrhythmias and heart failure complications, as a PCI

success criteria. Analysis of preoperative and postoperative 24h 2h standard 12-lead simultaneous ECG changes, paper speed 25mm / S. Measured by hand, each of the QT interval of the ECG (QRS wave starting point to T wave end, if the U wave, then to the T and U wave most recess), measuring the clinical data on patients who are totally blind, each case measurable leads in eight or more, the same lead continuous measurement 3 RR interval and QT interval, whichever is the mean. QT interval measurement unit is ms, QT dispersion (QTd) is defined as the QT max (QTmax) and QT minimum (QTmin) the difference, to exclude heart rate, QTd with Bazett's formula $QTc = QT/RR/2$ calculation. While observing all patients treated within 30 days of onset of cardiovascular events (MACE) occurred, including cardiac death, heart failure, severe arrhythmias, myocardial infarction and recurrent angina.

1.3 Statistical analysis SPSS13.0 statistical analysis software for analysis and processing, measurement data ($x \pm s$) that the groups were compared using t test, $P < 0.05$ indicates significant difference.

2 Results

2.1 PCI group before and after treatment compared with the control group 24hQTd change: Compared with before treatment, PCI group QTd significantly reduced after treatment, the difference was statistically significant ($P < 0.01$), control group, no statistical difference between before and after treatment significance ($P > 0.05$); compared with the control group, PCI group before treatment, the difference was not statistically significant ($P > 0.05$), PCI group after treatment QTd was significantly shorter, the difference was statistically significant ($P < 0.01$), as illustrated in table 1.

Table 1 PCI 24hQTt changes before and after treatment compared with the control group

Groups	Case	Prior treatment of QTd	Posttreatment QTd
PCI group	32	64.34±6.94+	45.12±7.55+ +Δ
Control group	11	63.78±5.87	61.23±6.15Δ Δ

Note: Compared with control group, ++ $P < 0.01$, + $P > 0.05$; each group compared with before treatment Δ $P < 0.01$, Δ Δ $P > 0.05$.

2.2 PCI group of patients before and after treatment with the patient 24hQTd change after 30 Comparison of the incidence of cardiovascular events: 32 patients with AMI underwent primary PCI 24 hours after treatment, the patient appeared to shorten QTd 23 patients were followed up after one case of cardiac death, severe arrhythmia four cases, three cases of recurrent myocardial infarction, cardiovascular event rate of 25% (8/32); QTd did not change significantly in 9 patients, cardiac death occurred in 2 cases, recurrent myocardial infarction 2 cases, 3 cases of severe arrhythmia, cardiovascular event rate was 77.8% (7/9), the difference was statistically significant ($P < 0.01$).

3 Discussion

QTt earliest repolarization of cardiac repolarization and the time difference between the latest, is a simple, non-invasive indicator of myocardial repolarization heterogeneity and instability of the electrical activity of ways. By Campbell and Cowan equal to 1985 first proposed the concept of QT dispersion and prove QT interval in the ECG is not a measurement error on the difference; while a certain regularity. Ueda et al [4] found, PCI

Preoperative and postoperative QTa major cardiovascular events and mortality are closely related. Modern studies suggest that, Qrd represents

the electrical activity of ventricular repolarization instability and non-synchronization, is a predictive ventricular tachycardia, ventricular fibrillation and sudden cardiac death is an important indicator of [1,2]. QTd in patients after AMI in predicting malignant arrhythmias and sudden cardiac death have been reported to occur [2,3], QTd after myocardial injury or disease increases, it may be due to myocardial ischemia in patients with AMI, potassium ion pump function by inhibiting the action potential three-phase K^+ , outflow obstruction, three-phase repolarization prolonged, should not be prolonged, resulting in myocardial ischemic area and surrounding normal cells refractory period dispersion increased QTd AMI patients showed prolonged. Part of early myocardial repolarization completely out of the refractory period, thus creating conditions for the exhumation, prone to malignant ventricular tachycardia or ventricular fibrillation and other arrhythmias. Our data showed, PCI group before and after treatment QTt improved significantly, which Liu et al. [5] reported values. The reason may be that after interventional treatment of patients with AMI blocked or narrowed coronary reperfusion, myocardial ischemia and reperfusion completely restored the uniformity of repolarization that QTd shortening, cardiac electrical activity to stabilize and reduce the heart of the source sudden death and malignant arrhythmia, thereby improving the

prognosis, so I believe that the significant improvement in QTd, PCI can be used as an effective treatment success observed indicators. Also in this group in the PCI group after coronary intervention QTd after 24h there have been some significant improvements, no significant improvement in some patients, two groups of patients were followed up for 30 days, were observed in the incidence of cardiovascular events, The results showed significant improvement in patients with QTd incidence of cardiovascular events was significantly lower than in patients with no obvious improvement QTd, QTd These results suggest that the degree of change before and after PCI can be used as a predictor of prognosis, reducing the more obvious, the prognosis may be more desirable. Our results show that, ANI QTd were significantly higher than normal, the success of the PCI can improve myocardial ischemia or infarction and reperfusion increase their electrical stability, improving myocardial repolarization heterogeneity, QTd and degree of change can be as the evaluation of myocardial perfusion and recent prognostic indicators.

References

- [1] Wang Xue Qiao, Huang Dong, Xuebo Liu. Primary percutaneous coronary intervention for acute myocardial infarction QT Dispersion [J]. Chinese Journal of Primary Medicine, 2010,17 (23) :3187 -3188.
- [2] Yang Lirong, Chenguo Bing, Zhang Y., et al. QT dispersion in patients with acute myocardial infarction degree of correlation with prognosis [J]. Chinese Journal of Clinical Pharmacology, 2011,27 (3) :167-169.
- [3] Chang Po-ya, party, Dang Qun, et al. QTd change and prognosis of coronary heart disease patients treated with PCI relationship [J]. Shandong Medical Journal, 2010,50 (4) :105-106.
- [4] ueda H, Itaymdai T, Tsumura, K, et al. QT dispersion and prodiagnosis after cOronary stent placement in acute myocaldi8l infarction [J]. Clin cordiol, 2007; 30:229-233.
- [5] Liu Tao, Zhang Xuefeng. Coronary intervention for acute myocardial infarction QTc dispersion [J]. Hunan University of Chinese Medicine, 2010,30 (2) :12-13.

6/21/2013