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RESEARCH ARTICLE

CLINICAL EFFICACY OBSERVATION OF THE APPLICATION OF TICAGRELOR FOR THE PCI PATIENTS WITH ACUTE CORONARY SYNDROME

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ABSTRACT

To investigate the clinical efficacy and safety of Ticagrelor in the application of (ACS) PCI in patients with acute coronary syndrome. 114 cases of acute coronary syndrome (ACS) patients with PCI treatment from April 2014 - March 2015 in our hospital have been selected, and then 57 cases (Clopidogrel loading dose 300mg before PCI, maintenance dose 75mg qd) were randomly divided into control group, and 57 patients (Ticagrelor loading dose 180mg before PCI, maintenance dose of 90mg bid). Two groups were observed by the incidence of thromboembolic events and coronary blood flow in PCI surgery, and patients were observed after the PCI surgery in 1 month, 3, 6, and 12 months following up. Also, the observation of the recurrent angina, myocardial infarction, sudden cardiac death, stroke and other cardiovascular and cerebrovascular adverse events and adverse drug reactions to the patients after the surgery with one year was conducted. In both groups, the occurrence of acute thrombosis was similar, there was no statistically significant difference (P> 0.05); the intraoperative coronary blood flow grade of treatment group was significantly better than that of the control group, and the difference was statistically significant (P <0.05). 16 cases of ACS occurred in the control group, and 7 cases occurred in the treatment group (P <0.05); the occurrence rate of breathing difficulty in control group was significantly lower than that of in the treatment group (p <0.05); the occurrence rates of bleeding in the control and treatment groups were 8.8%, 10.5% respectively, and no statistically significant difference (p> 0.05); no sudden cardiac death and stroke in two groups (p> 0.05). To the PCI patients with acute coronary syndrome, the application of Ticagrelor could improve the coronary blood flow in patients with surgery, and then reduced the recurrence rate of postoperative ACS event, and the incidence of bleeding events would not increase.

INTRODUCTION

Acute coronary syndrome (ACS) is one of the common acute and severe diseases in cardiology. It is a serious harm and has a high rate of sudden death. Platelet activation, adhesion and aggregation are the key links in a series of pathophysiological processes. Antiplatelet therapy can reduce the incidence of ischemic events and improve the prognosis of patients, of which the dual oral antiplatelet therapy of clopidogrel combined with aspirin is the footstone for ACS and / or PCI post prevention of thrombotic events [1]. However, due to the presence of clopidogrel resistance in some patients, even if the dual antiplatelet therapy, these patients will still exist in clinical ischemic events. Tigrielol is a new antiplatelet agent that does not require the activation of the hepatic enzyme P450 to activate antiplatelet function, so it remains effective in patients with clopidogrel resistance. In this paper, the author collected 114 cases of acute coronary syndromes in patients with clinical data analysis, and the purpose of it is to observe the Ticagrelor in patients with acute coronary syndromes during PCI, postoperative application of clinical efficacy and safety.

MATERIALS AND METHODS

General information was selected from 114 patients with acute coronary syndrome (ACS) and had been conducted PCI treatment from April 2014 to March 2015 in our department of hospital, including 71 males and 43 females. Selection criteria: ① meet the diagnostic criteria of acute coronary syndrome and the guidelines of 2012 percutaneous coronary intervention in patients; ② patients agree with emergency or elective PCI. Exclusion criteria: ① patients do not have the inclusion criteria; ② patients who had been taking clopidogrel, tigelore or other antiplatelet drugs; ③ uncontrolled hypertension ④ thrombocytopenia or blood disease; ⑤ gastrointestinal motility ulcer or Hemorrhage; ⑥ cerebrovascular disease. 114 patients were randomly divided into control group (clopidogrel) and treatment group (Ticagrelor) according to the order of hospitalization time. There were 57 patients in the control group, including 35 males and 22 females, with a mean

age of (64.2 ± 8.1) years. The treatment group included 57 males and 21 females with an average age of (63.5 ± 7.8) years. There were no significant differences in age, sex, body mass index, smoking and concomitant diseases between the two groups (p> 0.05).

METHODS

All selected patients were treated by the conventional drug treatment in accordance with the guidelines of acute coronary syndrome according to the disease needs, such as: aspirin, isosorbide dinitrate, metoprolol, simvastatin and other drugs. At the same time, the patients were also treated according to our 2012 PCI treatment guidelines for emergency or elective PCI treatment. In the control group, clopidogrel was added on the basis of conventional drugs and PCI treatment, the loading volume of PCI was 300mg and the maintenance dose was 75mg qd. In the treatment group, conventional therapy and PCI were added with tigeloil, 180 mg, maintenance dose 90 mg bid.

① Preoperative related laboratory tests, such as: blood, liver function, renal function, myocardial enzymes, and troponin. ② The incidence of acute thrombosis and coronary blood flow in two groups. (3) To observe the incidence of major adverse cardiac and cerebrovascular events (MACCE), such as angina pectoris, myocardial infarction, sudden cardiac death, stroke and so on. To observe the incidence of drug-related adverse events such as dyspnea associated with drugs and bleeding events during treatment.

Statistical Analysis

SPSS16.0 statistical software was adopted for analysis, by measurement data ($\bar{x}$ ± S), using paired t test, count data taking $\chi 2$ test, and P <0.05 was considered statistically significant.

RESULTS

Comparison of clinical data ① Two groups of patients with preoperative laboratory test results were not statistically significant difference (P> 0.05). ② There were no significant differences in the number of vascular lesions and the number of stents implanted in operation (P> 0.05).

Comparison of acute thrombosis, coronary blood flow in the two groups. The incidence of acute thrombosis was similar, the difference was not statistically significant (P> 0.05); the intraoperative coronary blood flow classification of control group was significantly worse than that of the treatment group; the number of cases of no reflow and slow blood flow occurred in treatment group was significantly greater than that of the control group, the difference was statistically significant (P <0.05). See Table 1.

Table 1 Comparison of the two groups of patients (%)

Group	Case	with acute thrombosis	no-reflow and slow blood flow
Control Group	57	3（5.2%）	13（22.8%）
Treatment Group	57	1 （1.7）	6 （10.5%）
P-Value		>0.05	<0.05

Comparison of the occurrence of adverse cardiac and cerebrovascular events one year after operation. In the control group, there were 16 cases of acute coronary syndromes, including 13 cases of recurrent angina, 3 cases of myocardial infarction; In the treatment group, there were 7 cases of acute coronary syndrome, of which, 6 cases of recurrence of angina pectoris, 1 case of myocardial infarction, the total incidence of cardiovascular and cerebrovascular adverse events were statistically significant (P <0.05). No sudden cardiac death or stroke occurred in either group. See Table 2.

Table 2 Comparison of adverse cardiac and cerebrovascular events 1 year after operation

Group Case	# of adverse cardiac and cerebrovascular events					
		Recurrent angina	Myocardial Acute infarction	Cardiac death	Stroke	(%) coronary syndromes
Control	57	13	3	0	0	16（28.1）
Treatment	57	6	1	0	0	7（12.2）
P-Value		<0.05	>0.05	-	-	<0.05

Comparison of the occurrence of bleeding event and dyspnea 1 year after operation. (1) No cerebral hemorrhage occurred in two groups' patients during follow-up period after operation. In the control group, there were 5 cases of bleeding event, including 1 case of gastrointestinal bleeding, 6 cases of bleeding in the treatment group, no gastrointestinal bleeding. There was no significant difference in the incidence of bleeding events between the two groups after symptomatic treatment (P> 0.05). (2) The occurrence of dyspnea in two groups' patients. There were 2 cases of dyspnea in the control group and 5 cases of dyspnea in the treatment group. The number of dyspnea occurred in the treatment group was significantly higher than that of the control group (P <0.05), but symptom released after symptomatic treatment of dyspnea. See Table 3.

Table 3 Comparison of the occurrence of bleeding event and dyspnea 1 year after operation

Event	Control G. (case) (n=57)	Treatment G. (n=57)	P-value
Cerebral hemorrhage	0	0	-
Gastrointestinal bleeding	1	0	>0.05
Skin ecchymosis	2	2	>0.05
Gingival bleeding	1	2	>0.05
Nasal bleeding	1	2	>0.05
Total	5	6	>0.05
Dyspnea	2	5	<0.05

DISCUSSION

Acute coronary syndrome has acute onset with high mortality. The percutaneous coronary intervention is currently recognized as one of the most effective treatment. As a result of plaque rupture and endothelial damage during surgery, prone to acute, subacute and late thrombosis, leading to sudden death, platelet activation, aggregation plays a major role in the thrombosis process. Therefore, double anti-platelet therapy (aspirin and clopidogrel) is one of the conventional methods to prevent stent perioperative and postoperative thrombotic events [2].

Clopidogrel is a thiophene antiplatelet agent, a prodrug that is not active by itself. It needs to enter the body through the transformation of cytochrome into active substances after arriving at liver, by irreversible effects on the surface of the platelet adenosine diphosphate receptor, inhibition of platelet surface fibrinogen binding site exposure, and to prevent the platelet cascade amplification chain activation reaction, thereby inhibiting the body's platelet coagulation [3]. Clopidogrel resistance is present in some patients after PCI, resulting in an ischemic cardio-cerebrovascular event in

approximately 25% -30% of patients after PCI. Qimin Cheng [4] reported that clopidogrel resistance may be related to the following factors: genetic factors, drug interactions, pathological changes, insulin, gastrointestinal factors and patients with oral clopidogrel dose, whether smoking, coronary stent drug eluting stents and other factors. According to Chang Peifen *et al* [5] reported that: Ticagrelor is a new structure of the reversible combination of ADP P2Y12 receptor inhibitors, with two advantages: (1) as a non-prodrug, no metabolic activation can be directly activated, and produce inhibition of platelet rapidly (2) due to reversible binding, clopidogrel is faster losing of effect, so once withdrawal of it, the platelet function can be quickly restored, thereby reducing the risk of bleeding [6]. Foreign scholars have shown that, by contrast to clopidogrel, no platelet resistance occurred to acute coronary syndrome patients taking Ticagrelor [7]. Therefore, in 2014, the European Society of Cardiology revascularization guide recommended that Ticagrelor is the first-line oral antithrombotic preferred in patients with high-risk ACS (compared with clopidogrel) [1]. In 2016, China Interventional Cardiology Conference announced on the DAYU study also confirmed that Ticagrelor was safe and reliable in the application of ACS PCI postoperative patients in China.

In this study, we found that coronary blood flow was superior to that of clopidogrel ($P < 0.05$) in the Ticagrelor group, which was related to the effect of Ticagrelor on non-prodrug and rapid platelet inhibition without metabolic activation ; One year follow-up after PCI, the incidence of adverse cardiac and cerebrovascular events in the Ticagrelor group was significantly lower than that in the clopidogrel group ($P < 0.05$), which might be related to the effect of Ticagrelorl on platelet inhibition with more strength and effectiveness. Another scholars reported that Ticagrelor also had effects on relaxing blood vessels, increasing the role of coronary blood flow velocity [1]. ($P > 0.05$). The incidence of dyspnea was higher in the Ticagrelor group than in the clopidogrel group ($P < 0.05$). The incidence of dyspnea was similar to that of Ticagrelor in the treatment of adenosine triphosphate analogue with bronchial stimulation, easily lead to adverse respiratory stress and bronchoconstriction [8], symptomatic relief with symptomatic treatment, so patients suffering from chronic obstructive pulmonary disease should avoid this usage as much as possible.

CONCLUSION

This study showed that ticagrelor could improve intraoperative coronary blood flow, reduce postoperative adverse cardiac and cerebrovascular events, which relate to the anti-platelet faster, stronger, and more effective, but did not increase the risk of bleeding, so it is deserve the clinical worthy of promotion and application. Due to the limited number of cases in this study, and failed to determine the rate of platelet inhibition, it needs more research, a larger sample size, with the determination of platelet inhibition rate, thereby more scientific description of the clinical efficacy of ticagrelor.

References

1. Pu Lianmei, Li Hong, Jin Zening, etc. Double and triple oral antiplatelet drug treatment of acute coronary syndromes. *Chinese Journal of Cardiology*. 2015, 43 (11): 1006- 1009. *Chinese Journal of Cardiology*, 2013, 41 (3): 183-194.
2. Chinese Medical Association cardiovascular disease branch, Chinese Journal of cardiovascular disease editorial board. Anti-platelet therapy expert consensus in China.
3. Wang Qun, Lin Wenhua. Ticagrelor in the treatment of acute coronary syndromes observed. *Shandong Medicine*. 2015, 55 (7): 77-79.
4. Qi Min, Han Wei. Aspirin and clopidogrel resistance mechanisms and coping strategies. *Anhui Medicine*. 2015, 19 (3): 413-416.
5. Chang Peifen, Chang Aixi, Jin Junjie. Tigre treatment stent in patients with clopidogrel after 1 case of non-response. *Hebei Medical Journal*. 2014, 36 (21): 3358-3359.
6. Lombo B, Diez JG. Ticagrelor: the evidence for its clinical potential as an oral antiplatelet treatment for the reduction of major adverse cardiac events in patients with acute coronary syndromes. *Core Evid*. 2011, 6 (3): 31-38.
7. Varenhorst C, Alstrm U, Scirica BM, *et al*. Factors contributing to the lower mortality with ticagrelor compared with clopidogrel in patients undergoing coronary Artery bypass surgery. *J AM Coll Cardiol*. 2012, 60 (17): 1623-1630.
8. Zhao Zilin, Tan Shandu, Huang Liangyan, *et al*. Clinical efficacy of Ticagrelor in comparison with clopidogrel in the treatment of acute coronary syndromes. *Jilin Medical Journal*. 2015, 36 (15): 3213-3215.

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