Clinical Observation of Esmolol Combined with Amiodarone in the Treatment of Acute Myocardial Infarction Complicated with Arrhythmia

Guanghe Han, Siqi Li, Jiayu Zhou

Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430032, Hubei, China

Abstract: Aim: To explore the clinical efficacy of esmolol combined with amiodarone in the treatment of acute myocardial infarction complicated with tachyarrhythmia. Methods: 82 patients with acute myocardial infarction complicated with tachyarrhythmia treated in our hospital from September 2020 to September 2021 were randomly divided into two groups, both of which received routine treatment measures. On this basis, 41 patients in the control group were treated with amiodarone, and 41 patients in the observation group were treated with esmolol combined with amiodarone. The ECG changes and clinical effects of the two groups were observed before and after treatment. Result: After treatment, the ECG PR interval in the observation group was longer and QT interval was shorter than that in the control group (P < 0.05). In terms of clinical total effective rate, 97.56% in the observation group was significantly higher than 87.80% in the control group (P < 0.05). Conclusion: esmolol combined with amiodarone is effective in patients with acute myocardial infarction complicated with tachyarrhythmia, which is helpful to shorten the QT interval of ECG.

Keywords: Esmolol; Amiodarone; Acute Myocardial Infarction; Tachyarrhythmia.

1. INTRODUCTION

Acute myocardial infarction is a clinical multiple cardiovascular disease, and it is also one of the main causes of death. Acute myocardial infarction is prone to a series of complications, among which rapid ventricular arrhythmia is the most common, which usually occurs in the early stage of myocardial infarction aggravation [1]. Amiodarone is an antiarrhythmic drug widely used in clinic. Esmolol belongs to β kind of receptor blocker, which can quickly control ventricular rate in a short time. Based on this, this paper mainly discusses the clinical efficacy of esmolol combined with amiodarone in the treatment of acute myocardial infarction complicated with tachyarrhythmia. the results are reported as follows.

2. DATA AND METHODS

2.1 General information

82 patients with acute myocardial infarction complicated with tachyarrhythmia treated in our hospital from September 2020 to September 2021 were selected into the study and divided into two groups according to the random number table method. There were 26 males and 15 females in the control group (n = 41); the age ranged from 51 to 64 years, with an average of (58.45 ± 6.59) years. There were 28 males and 13 females in the observation group (n = 41); the age ranged from 50 to 66 years, with an average of (58.78 ± 6.32) years. Comparing the basic information, there was little difference between the two groups (P > 0.05), which can be compared.

2.2 Methods

Both groups received routine treatment for acute myocardial infarction after admission. On this basis, the patients in the control group were treated with amiodarone. After mixing 3mg/kg amiodarone injection with 20ml 5% glucose solution, they were injected intravenously for 10 minutes, and then injected with infusion pump, maintaining the dose of 1mg per minute. After 6 hours, it was reduced to 0.5mg per minute until the sinus rhythm was restored, and the continuous medication time was within 48 hours. Then take amiodarone orally, 200mg per day for one week.
The patients in the observation group were treated with esmolol combined with amiodarone, and the usage and dosage of amiodarone were the same as those in the control group. Intravenous injection of 0.5mg/kg esmolol injection was completed within one minute. Subsequently, the infusion pump was used for injection, and the maintenance dose was 0.05mg/kg per minute for 24 hours.

2.3 Observation index

ECG: ECG indexes of the two groups were recorded before and after 48 hours of treatment, including PR interval and QT interval. 2.3. 2Clinical efficacy: after treatment, the symptoms of myocardial infarction were significantly improved, the arrhythmia disappeared, and the ECG returned to normal, indicating significant effect; After treatment, the symptoms of myocardial infarction improved and the ventricular premature contraction decreased by more than 60%, indicating that it is effective; After treatment, the symptoms of myocardial infarction did not change, the ventricular premature contraction decreased by less than 60%, and there was still atrial fibrillation, indicating that it was ineffective. Total effective rate = (markedly effective+effective)/total number of patients × 100%.

2.4 Statistical analysis

SPSS21.0 software was used to conduct statistical analysis on the data. the measurement data conforming to the normal distribution was expressed in (± s). T was used to test the inter group data, and [n (%)] was used to represent the counting data. And x² was used to test the inter group data. the difference was statistically significant with P < 0.05.

3. RESULT

3.1 Comparison of ECG between the two groups before and after treatment

Before treatment, there was little difference in ECG PR interval and QT interval between the two groups (P > 0.05); After treatment, the ECG PR interval of the observation group was longer than that of the control group, and the QT interval was shorter than that of the control group. the difference was statistically significant (P < 0.05), as shown in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>PR interval</th>
<th>QT interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
</tr>
<tr>
<td>control group(n=41)</td>
<td>0.10±0.02</td>
<td>0.12±0.03</td>
</tr>
<tr>
<td>observation group(n=41)</td>
<td>0.11±0.03</td>
<td>0.16±0.04</td>
</tr>
<tr>
<td>t</td>
<td>1.776</td>
<td>5.122</td>
</tr>
<tr>
<td>P</td>
<td>0.080</td>
<td>0.000</td>
</tr>
</tbody>
</table>

3.2 Comparison of clinical efficacy between the two groups

In terms of total clinical effective rate, 97.56% in the observation group was significantly higher than 87.80% in the control group (P < 0.05), as shown in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>Remarkable effect</th>
<th>valid</th>
<th>invalid</th>
<th>Total effective rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>control group(n=41)</td>
<td>27(65.85)</td>
<td>9(21.95)</td>
<td>5(2.20)</td>
<td>36(87.80)</td>
</tr>
<tr>
<td>observation group(n=41)</td>
<td>32(78.05)</td>
<td>8(19.51)</td>
<td>1(2.44)</td>
<td>40(97.56)</td>
</tr>
<tr>
<td>x²</td>
<td></td>
<td></td>
<td></td>
<td>7.021</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>0.008</td>
</tr>
</tbody>
</table>
3.3 Discussion

Patients with acute myocardial infarction complicated with tachyarrhythmia often have a significant increase in ventricular pre systolic frequency and atrial activation frequency, and a significant increase in myocardial oxygen consumption, which is easy to lead to the aggravation of myocardial necrosis, and even endanger life safety due to cardiogenic shock and sudden death.

Amiodarone is one of class III antiarrhythmic drugs and also the first-line drug for clinical treatment of arrhythmia. It can restore sinus rhythm by increasing the phase III time course of myocardial action potential, reducing reentry activation and inhibiting the conduction in sinus, atrium and node area [2]. However, amiodarone’s class III antiarrhythmic effect is relatively slow. From the results of this study, it can be seen that the total clinical effective rate of the observation group treated with esmolol combined with amiodarone is significantly higher than that of the control group (P < 0.05). It can be seen that esmolol combined with amiodarone is effective in patients with acute myocardial infarction complicated with tachyarrhythmia. Esmolol belongs to class II antiarrhythmic drugs, which has the characteristics of rapid onset, rapid metabolism and rapid elimination. Esmolol can reduce premature ventricular contraction in a short time, quickly control ventricular rate, restore ventricular fibrillation and reduce the risk of early sudden death [3]. Combined with amiodarone can restore sinus rhythm and improve short moment ventricular tachycardia faster, which has more obvious advantages than single drug. the shortening of ECG PR interval represents the presence of preexcitation syndrome and is more prone to tachyarrhythmia. Prolonged QT interval represents a potential risk of malignant ventricular rate abnormalities and sudden cardiac death. In this study, after treatment, the ECG PR interval of the observation group was longer and QT interval was shorter than that of the control group (P < 0.05), indicating that esmolol combined with amiodarone in the treatment of acute myocardial infarction complicated with tachyarrhythmia can effectively improve ECG indexes and make patients recover normal sinus rhythm faster.

4. CONCLUSION

Esmolol combined with amiodarone is effective in patients with acute myocardial infarction combined with tachyarrhythmia and helps to shorten the qt interval of electrocardiogram, which is of significant clinical application.

REFERENCES

