

## **Research on clinical effects of valsartan and metoprolol combined therapy on elder patients with acute myocardial infarction and fatal arrhythmia.**

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### **Abstract**

**Objective:** This paper aims to discuss the clinical effects of therapy with a combination of valsartan and metoprolol on elder patients with acute myocardial infarction and fatal arrhythmia.

**Methods:** A total of 78 cases of acute myocardial infarction and foetal arrhythmia registered in our hospital from October 2015 to 2016 were selected and divided into the control group and observation group randomly according to the double-blind random principle. A total of 39 cases were included in each group. The control group received metoprolol only, whereas the observation group was treated with the combination of metoprolol and valsartan. Clinical effects of these treatments on the two groups were compared.

**Results:** The observation group is superior to the control group in terms of the total therapeutic efficiency, incidence of ventricular fibrillation, and death rate, and the difference was significant ( $P<0.05$ ). The Left Ventricular Ejection Fraction (LVEF) and average stay of the observation group were better than those of the control group, and the difference was significant ( $P<0.05$ ). Before the treatment, the two groups had similar PICP, PCIII, MMP-1 and TIMP-1 ( $P>0.05$ ). After the treatment, PICP, PCIII, and MMP-1 of the observation group were significantly lower than those of the control group ( $P<0.05$ ). However, the TIMP-1 of the observation group is significantly higher than that of the control group ( $P<0.05$ ). The control group shows much higher incidence of complications and death rates compared with the observation groups ( $P<0.05$ ).

**Conclusions:** The combined therapy of valsartan and metoprolol shows high safety and satisfying clinical effect when used on elder patients with acute myocardial infarction and fatal arrhythmia. This treatment is worth extensive promotion.

**Keywords:** Elder patients, Myocardial infarction, Arrhythmia, Valsartan.

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### **Introduction**

Acute Myocardial Infarction (AMI) is a myocardial ischemia and necrosis disease caused by coronary artery interruption or other reasons [1]. The most prominent clinical symptoms include serious chest pain, fever, and cardiac dysfunction. Arrhythmia is one of the most common complications of this disease [2]. AMI and arrhythmia will intensify ischemia and threaten the life of patients. Therefore, scientific and effective treatments to complications are needed [3]. In our hospital, the valsartan and metoprolol combined therapy was applied to elderly patients with acute myocardial infarction and fatal arrhythmia. This combined therapy had outstanding clinical effect. Results are presented in the following text.

### **Information and Methods**

#### ***Clinical data***

A total of 78 cases of patients with AMI and foetal arrhythmia who were admitted to our hospital from October 2015 to 2016 were chosen as the research subjects. To ensure accuracy of experimental results, the patients were divided into the observation and control groups by random sampling method. The control group had 39 cases with a gender proportion of 7:6. Ages were 60-72 y old (average,  $64.8 \pm 1.0$  y old). The average duration was  $2.5 \pm 1.4$  y. The observation group had 39 cases with a gender proportion of 20:19 and ages 61-75 y old (average,  $65.2 \pm 1.3$ ). The average duration was  $2.0 \pm 1.2$  y. The two groups have no statistically significant differences in general data ( $P>0.05$ ).

### **Inclusion and exclusion standards**

**Inclusion standards:** Patients were diagnosed with AMI and foetal arrhythmia according to related contents of Chinese Medical Association in the Guideline for Diagnosis and Treatment of Acute Myocardial infarction. All patients were informed regarding the experimental content and signed the Informed Consent.

**Exclusion standards:** Patients with hypotension, hyperkalaemia or liver and kidney dysfunction.

### **Treatment methods**

Two groups were intervened with conventional therapies, including thrombolysis, analgesia, and anti-freezing after the diagnosis. The control group was only treated by metoprolol (Wuhan Bingbing Pharmaceutical Co., Ltd. SFDA approval No: J20100098). Metoprolol was taken orally for 1 month, twice a day at 25 mg/time. The observation group was treated with both metoprolol and valsartan (Huirui Pharmaceutical Co., Ltd. SFDA approval No.: H20051409). Valsartan was taken orally for 1 month at one piece (10 mg) each time. Curative effects on the two groups were observed.

### **Evaluation standards of curative effect**

After the observation and control groups were treated for 4 weeks. The curative effect was evaluated by ECG detection.

**Table 1.** Total curative effects of two groups (n, %).

Groups	Cases (n)	Significant effective (%)	Effective (%)	Ineffective (%)	Total curative effect (%)
Control group	39	18 (46.15%)	10 (25.64%)	11 (28.21%)	0.7179
Observation group	39	22 (56.41%)	13 (33.33%)	4 (10.26%)	0.8974
$\chi^2$	/	18.287	15.46	28.866	28.825
P	/	P<0.05	P<0.05	P<0.05	P<0.05

**Table 2.** LVEF and average stay of two groups ( $\bar{x} \pm S$ ).

Groups	LVEF (%)	Average stay (d)
Control group	63.82 $\pm$ 7.65	8.7 $\pm$ 1.6
Observation group	60.17 $\pm$ 5.57	12.3 $\pm$ 2.2
T	2.346	8.05
P	0.022	0

### **Comparison of biochemical indexes before and after the treatment**

In this study, the two groups have similar PICP, PCIII, MMP-1 and TIMP-1 before the treatment (P>0.05). After the treatment, PICP, PCIII, and MMP-1 of the observation group were significantly lower than those of the control group (P<0.05). However, the TIMP-1 of the observation group was significantly higher than that of the control group (P<0.05). The results are shown in Table 3.

The evaluation standards were divided into three levels, namely, significant effective, effective, and ineffective. Significant effective: arrhythmia disappeared completely, or arrhythmia was relieved by 80%-100%. Effective: arrhythmia was relieved by 50%-79%. Ineffective: arrhythmia was only improved by less than 49% after 1 month of treatment or was not relieved.

### **Statistical analysis**

All experimental data were analyzed by SPSS. Enumeration data were expressed by percentage and evaluated by  $\chi^2$ -test. P<0.05 represented significant difference.

## **Results**

### **Comparison of curative effects**

The total curative effect of the observation group after 4 weeks of treatment was 89.74%, which was higher than that of the control group. Results are listed in Table 1.

### **Comparison of LVEF and average stay**

The observation group was superior to the control group in terms of LVEF and average stay, thereby showing statistically significant difference (P<0.05). Results are shown in Table 2.

### **Comparison of complications and death rate**

The incidence of complications and death rates of the control group were significantly higher than those of the observation group (P<0.05) (Table 4).

## **Discussion**

AMI with arrhythmia is one of the acute diseases that threaten the life of patients. Considering the function decline of the elderly, the occurrence of arrhythmia is very likely to cause serious consequences if not treated immediately [4]. Cardiac failure of patients with AMI is mainly caused by AMI. Many clinical studies have reported that the population of patients with AMI is not very large. Therefore, determination of the development of cardiovascular diseases after AMI has been the subject of many clinical studies [5,6]. The continuous growth of plasma BNP in patients with AMI is mainly attributed to natriuretic hormone composing of 32 amino acids, which are

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excreted by heart chambers, and is positively correlated with ventricular wall tension [7].

**Table 3.** Comparison of biochemical indexes before and after the treatment.

Groups	Cases	PICP	PCIII	MMP-1	TIMP-1
Control group (n=39)	Before	32.89 ± 3.16	50.68 ± 7.69	1.03 ± 0.19	61.47 ± 10.39
	After	13.19 ± 1.94 <sup>x</sup>	31.55 ± 6.29 <sup>x</sup>	0.99 ± 0.11 <sup>x</sup>	66.63 ± 11.99 <sup>x</sup>
Observation group (n=39)	Before	30.01 ± 3.21	53.35 ± 8.14	1.09 ± 0.16	59.91 ± 8.87
	After	15.16 ± 3.29 <sup>x</sup>	36.49 ± 7.77 <sup>x</sup>	1.02 ± 0.24 <sup>x</sup>	60.33 ± 4.56 <sup>x</sup>

Note: <sup>\*</sup>P<0.05 indicates significant difference between the observation and control groups. <sup>x</sup>P<0.05 indicates significant difference between before and after the treatment.

**Table 4.** Comparison of complications and death rates (n, %).

Groups	Cases (n)	Complications	Death rate
Control group	39	6 (15.38%)	4 (10.26%)
Observation group	39	1 (2.56%)	1 (2.56%)
$\chi^2$	/	22.358	15.562
P	/	P<0.05	P<0.05

BNP level after AMI attack continues to increase, indicating poor prognosis. The sharp increase of BNP level after AMI might be caused by the enhancing ventricular wall tension at the intersection of myocardial infarction and myocardial infarction area, thereby strengthening the increase of ventricular wall tension because of the plasma BNP concentration [8]. Ventricular muscle cell structure changes after AMI attack, and significant difference is developed accordingly between the left and right ventricular muscles is developed, thereby resulting in sudden death of patients.

In this experiment, the observation group was treated with the valsartan and metoprolol combined therapy. Valsartan mainly inhibits synthesis of HMG-CoA reductase, thereby inhibiting synthesis of *in vivo* cholesterol. The reduction of total cholesterol content in cells stimulates cell synthesis and accelerates the low density lipoprotein (LDL) receptors. Thus, the following effects ensue: increase in the number of LDL receptors on the liver surface and enhanced activity; promotion of LDL; Very Low Density Lipoprotein (VLDL) and VLDL remnants to metabolite through the degradation pathways of receptors; reduction of serum LDL content and protection of patients with AMI from further injury. Selective angiotensin-II antagonist agent can stop AT1 receptor-mediated angiotensin II and reduce K content in blood, which relieves bradykinin and reduces ventricle stimulus to muscle, thereby realizing the goal of the treatment [9,10]. In this experiment, the observation group was superior to the control group in terms of total therapeutic efficiency and incidence of ventricular fibrillation and death rate, and the difference was significant (P<0.05). The observation group performed much better in terms of LVEF and average stay than the control group (P<0.05). Before the treatment, the two groups had similar PICP, PCIII, MMP-1 and

TIMP-1 (P>0.05). After the treatment, PICP, PCIII, and MMP-1 of the observation group are significantly lower than those of the control group (P<0.05). However, the TIMP-1 of the observation group was significantly higher than that of the control group (P<0.05). The control group showed far higher incidence of complications and death rates compared with the observation groups (P<0.05).

### Conclusion

Valsartan and metoprolol combined therapy has outstanding curative effect on elderly patients with AMI and fatal arrhythmia and is worth extensive promotion.

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