Clinical Efficacies of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patients with Heart Failure Due to Valvular and Non-Valvular Heart Disease

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Abstract: Objective: To analyze the clinical efficacies and treatment of patients with heart failure due to valvular and non-valvular heart disease by the use of recombinant human brain natriuretic peptide. **Methods**: 80 patients with valvular and non-valvular heart disease treated in our hospital are selected as the research objects from January 2018 to December 2018, and are divided into two groups according to the different types of the disease, namely, group A (n=40 cases) caused by valvular heart disease, and group B (n=40cases) caused by non-valvular heart disease. Patients in both group A and B are treated with recombinant human brain natriuretic peptide, and the therapeutic effect and the level of each index are compared between the two groups. **Results**: There is no significant difference in the therapeutic effect between group A and group B. In the two indexes of CRP and BNP, group A is higher than group B ($p<0.05$). **Conclusion**: Patients with valvular and non-valvular heart disease have achieved good therapeutic effects with recombinant human brain natriuretic peptide, and patients with non-valvular heart disease have better therapeutic effects.

Heart failure usually occurs in the final stage of disease development in patients with heart disease. In this case, the patient's cardiac function cannot be guaranteed, and there is also a serious decompensation phase, which poses a serious threat to the patient's life safety. Studies have shown that the content of natriuretic peptide in the body of patients with heart failure will change, which greatly affects the treatment effect. In order to adjust the situation of the patient's body, it is necessary to take natriuretic peptide supplementation therapy [1]. Recombinant human brain natriuretic peptide (rhBNP) is mainly manufactured artificially. The bioactivity and mechanism of rhBNP are similar to those of natriuretic peptide secreted by human body, but the effect of rhBNP on different heart diseases has not yet been determined. In this study, rhBNP is used to treat patients with valvular and non-valvular heart diseases in our hospital. The specific analysis is conducted as follows.

1. Materials and methods

1.1 General information

80 patients with valvular and non-valvular heart disease treated in our hospital are selected as the research objects from January 2018 to December 2018, and are divided into two groups according to the different types of the disease, namely, group A (n=40 cases) caused by valvular heart disease, and group B (n=40cases) caused by non-valvular heart disease. In group A, 24 cases are male and 16 cases are female. The minimum age is 35 years old and the maximum age is 80 years old. The average age is (76.4 ± 9.2), and the duration of illness is between 3 and 18 years with an average duration of (8.2 ± 3.8) years. There are 22 males and 18 females in group B. The minimum age is 33 years old and the maximum age is 80 years old, with an average age of (74.2 ± 9.6), and the duration of illness is between 3 and 15 years with an average duration of (9.0 ± 3.3) years. After comparison, it can be seen that there is significant difference in the basic data between the two

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groups (P > 0.05).

Inclusion criteria: All patients are clinically confirmed to have heart disease and heart failure. They are informed and agreed to participate in the study.

Exclusion criteria: Patients with serious diseases such as liver and kidney diseases, as well as having conscious obstacles, are not agreed to participate in this study.

1.2 Method

Both groups receive routine treatment at the time of admission. The routine drug treatment include digitalis, aspirin, diuretics, angiotensin converting enzyme and statins. On the basis of conventional treatment, patients in the two groups are treated with recombinant human brain natriuretic peptide (produced in Chengdu Nordican Biopharmaceutical Co., Ltd.). The initial dose used for the patients is 1.5 μg/kg, and the dosage is intravenous injection with load. Continuous intravenous injection can be used according to the patient's condition in the later period, and the rate of intravenous injection is 0.0075-0.01 μg/ (kg·min) with the total time of 120 hours.

1.3 Observation indicators [2-4]

The therapeutic effect and values of CRP and BNP in the two groups are observed in this study. Therapeutic effects include marked, effective and ineffective. The improvement of heart function in patients is above grade 2 and the symptoms of heart failure are significantly improved, which is markedly effective. That the improvement of cardiac function in patients is at level 1 or above can be marked as effective, and non-improvement of cardiac function and clinical symptoms is regarded as ineffective.

1.4 Statistical method

In this study, SPSS20.0 statistical software is used to analyze the data. Among them, % indicates count data and x2 test is used; x ± s indicates measurement data, and t-test is performed. Differences between groups are statistically significant when the value of p is less than 0.05.

2. Results

2.1 Comparison of clinical effect of treatment between the two groups

The effect of clinical treatment is evaluated, and the therapeutic effect of group B is slightly better than that of group B (p>0.05). The detailed data are shown in Table 1 below.

Table 1 Comparison of clinical effect of treatment between the two groups (n, %)

Group	Case	Marked	Effective	Ineffective	Total effective
Group A	40	21(52.50)	14(35)	5(12.5)	87.5%
Group B	40	22(55)	15(37.5)	3(7.5)	92.5%
X_2	-	2.571	2.308	4.718	4.718
p	-	0.182	0.152	0.105	0.105

2.2 Comparison of value of CRP and BNP after treatment between the two groups

After treatment, the value of CRP and BNP in group B are (6.25 ± 0.53) and (1125.41 ± 105.41) respectively. And that of CRP and BNP in group A are (7.55 ± 1.93) and (1436.53 ± 158.68) respectively. The data shows that the value of CRP and BNP in group B are lower than that in group A (t=8.926, 12.402, p=0.000).

3. Discussion

Heart disease is a serious type of disease in the clinic, which involves a variety of comorbidities. Heart disease patients may experience heart failure at the final stage of the disease, mainly due to abnormal episodes of left heart function. The contraction force will decrease, the load on the heart

position will be significantly increased, the myocardial function will be damaged, and there will be more serious abnormalities in cardiac function, which will have a more serious impact on the metabolism and survival of the patient [5]. In order to protect the myocardium and cardiac function of patients with heart failure, the clinical treatment of patients with heart failure mostly adjusts the situation of heart failure to promote the quality of life of patients. The study of natriuretic peptide is indispensable for clinical analysis of heart failure. In recent years, recombinant human brain natriuretic peptide (rhBNP) has been gradually used in the treatment of heart failure. The application is mainly based on the secretion of natriuretic peptide, which is closely related to the body vascular smooth muscle and endothelial cell guanylate cyclase coupling receptor. Moreover, it has a protective effect on vascular smooth muscle relaxation in patients, and can also increase the content of cyclic guanosine in the body. The therapeutic effect and its function of rhBNP is similar to that of endogenous natriuretic peptide in vivo, which can be used to supplement brain natriuretic peptide in vivo. Recombinant human brain natriuretic peptide is specifically made into a lyophilized powder injection by genetic engineering technology. Compared with traditional drugs, the effect of rhBNP is more extensive. At the same time, rhBNP has antagonistic effects on cardiac myocytes and cardiac fibroblast cells. It can protect patients' cardiovascular system and reduce the contents of endothelin and aldosterone [6]. It can also promote the absorption of sodium by glomerular arterioles and proximal small blood vessels, and relieve the burden of the patient's heart and reduce the burden of the drug on patients, and the effect of rhBNP is significant and safe.

There are two main types of heart failure, namely, valvular and non-valvular heart disease. Recombinant human brain natriuretic peptide (rhBNP) has different therapeutic effects in these two types of heart failure. In this study, rhBNP is used to treat patients with non-valvular heart disease and valvular heart disease in our hospital. Both groups achieve certain therapeutic effects, but there are still significant differences in some indicators related to heart failure. In the treatment of patients with valvular heart disease, the contents of CRP and BNP are still relatively high, while those of patients with non-valvular heart disease are relatively low. It can be seen that the treatment of rhBNP has some limitations in patients with valvular heart disease. It has better therapeutic effect in patients with non-valvular heart disease. Thus, in-depth clinical research can be conducted to adjust the treatment plan and be better applied to patients with valvular heart disease to improve the treatment effect and quality of life of patients.

References

[1] Li Bo. A Comparative Study of the Clinical Effects of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patient with Heart Failure due to Valvular and Non-valvular Heart Disease [J]. Chinese Medicine Guide, 2018, 16 (35): 159-160.

[2] Mei Baoying. Effect of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patient with Heart Failure due to Valvular and Non-valvular Heart Disease [J]. Chinese Medicine Guide, 2018, 16 (08): 158-159.

[3] Zhang Furong. Comparison of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patient with Heart Failure due to Valvular and Non-valvular Heart Disease [J]. Journal of Clinical Medicine and Archives, 2017, 4 (94): 18585.

[4] Wu Guokai. Clinical Effect of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patient with Heart Failure due to Valvular and Non-valvular Heart Disease [J]. World Medical Information Digest, 2017, 17 (83): 289.

[5] Xie Hui. Comparative Analysis of Clinical Effect of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patient with Heart Failure due to Valvular and Non-valvular Heart Disease [J]. Cardiovascular Disease Journal of Integrated Traditional Chinese and Western Medicine, 2016, 4(32): 59.

[6] Xu Baohua, Wu Youhua, Li Nan, Zhao Gang. Comparison of Recombinant Human Brain Natriuretic Peptide in the Treatment of Patient with Heart Failure due to Valvular and Non-valvular Heart Disease [J]. Chinese Journal of Gerontology, 2016, 36(21):5304-5306.