ACE Inhibitor Combined with Spironolactone in the Treatment of Non Adenoma Primary Hyperaldosteronism

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Abstract: Objective: To investigate the clinical effect of ACE inhibitor (ACEI) combined with Spironolactone in the treatment of non adenoma primary Hyperaldosteronism (PA). Methods: 80 patients who entered our hospital from August 2021 to August 2022 were randomly selected for this investigation. According to the random grouping method, the patients were randomly divided into the observation group and the control group. A total of 40 patients in the control group were treated with Spironolactone. A total of 40 patients in the observation group were treated with perindopril on the basis of the control group. After treatment in different ways, the treatment efficiency of the two groups was compared, The left ventricular end diastolic diameter (LVEDD), left ventricular Ejection fraction (LVEF) and left ventricular end systolic diameter (LVESD) before and after treatment were compared between the two groups, and the incidence of adverse reactions after treatment was compared between the two groups. Result: The effective rate of treatment in the observation group was 95%, significantly higher than 78% in the control group. The difference between the two groups was significant and statistically significant ($p<0.05$). Before treatment, there was no significant difference in LVEDD, LVEF, and LVESD between the two groups ($p>0.05$). After treatment, the LVEF of both groups of patients increased, but the observation group was significantly higher than the control group, and the LVEDD and LVESD of both groups of patients were significantly reduced, but the observation group was significantly lower than the control group, The difference between the two groups was significant and statistically significant ($p<0.05$). The incidence of adverse reactions in the observation group was 12.5%, while the incidence of adverse reactions in the control group was 15%. There was no significant difference between the two groups and there was no statistically significant difference ($P>0.05$). Conclusion: The combination of Spironolactone and ACEI in PA patients has a more significant effect, can significantly improve the treatment efficiency of patients, improve the cardiac function indicators of patients more significantly, and will not increase additional adverse reactions. It has clinical value.

Keywords: ACE Inhibitor; Spironolactone; Non Adenomatous Type; Primary; Hyperaldosteronism

Introduction

PA is a Endocrine disease, which is characterized by the continuous increase of Aldosterone (ALD) level in the body, while renin, blood pressure and blood volume are not significantly affected [1]. It usually refers to the production of excessive ALD in tissues outside the adrenal gland, leading to an increase in ALD concentration in the blood. The main symptoms of the disease include hypertension, Hypokalemia, muscle weakness and arrhythmia. If not treated in time, blood pressure may rise, while long-term hypertension will increase the risk of cardio cerebral Vascular disease, such as cardiac overload, cardiac

hypertrophy, heart failure and other heart diseases. In addition, long-term hypertension can also cause damage to the kidneys, and long-term failure to treat it may lead to impaired renal function, posing a serious threat to the patient's life and health. Therefore, for such patients, timely medical treatment should be sought to avoid adverse consequences. In clinical practice, drug therapy is the main method for treating this disease. For patients who cannot control their condition, surgery can be chosen to remove the adrenal gland or surrounding tissues. Drug therapy mainly includes ACEI, Angiotensin II receptor blocker, Calcium channel blocker, Diuretic and Aldosterone receptor antagonist. Due to the different mechanisms of action of various drugs, there are also certain differences in the therapeutic effects produced. This investigation will explore the clinical effect of ACEI combined with Spironolactone in the treatment of this disease. The specific reports are as follows:

1. Materials and Methods

1.1 General Information

The research subjects of this survey were a total of 80 randomly selected patients who entered our hospital for treatment from August 2021 to August 2022. According to the random grouping method, the patients were divided into an observation group and a control group, with an average of 40 patients in each group. The observation group had 22 male patients and 18 female patients, ranging in age from 42 to 78 years old, with an average age of (56.34 ± 4.12) years old. The control group had 21 male patients and 19 female patients, The age ranges from 41 to 77 years old, with an average age of (56.04 ± 3.92) years; Inclusion criteria: (1) The patient is over 18 years old; (2) Patient's systolic blood pressure ≥ 140mmHg and/or diastolic blood pressure ≥ 90mmHg; (3) The patient's blood potassium is normal (3.5-5.5mmol/L); Exclusion criteria: (1) Pregnant or lactating women; (2) Other obvious diseases besides hypertension (such as heart disease, liver disease, kidney disease, etc.); (3) Blood potassium<3.5mmol/L or>5.5mmol/L; (4) Hypertension caused by other reasons; There was no significant difference in general information such as gender and age between the two groups of patients, with statistical significance ($p<0.05$).

1.2 Method

After admission, both groups of patients need to closely monitor the patient's blood pressure, heart rate, electrocardiogram, blood potassium, blood sodium, blood pH and other indicators, and give routine treatment, such as digitalis drugs to improve myocardial contractility, increase Cardiac output, and improve cardiac function; Loop Diuretic, Thiazide, etc. can promote the excretion of sodium, water and potassium, reduce blood pressure and correct low potassium; Rectify acid-base imbalance caused by metabolic Acidosis and low potassium by intravenous injection of sodium bicarbonate or sodium chloride; At the same time, it is recommended that patients reduce salt and fat intake, control weight, avoid excessive drinking and smoking, so as to reduce the burden of the heart and lower blood pressure. On this basis, the patients in the control group were given Spironolactone orally, 20mg/time, 3 times/day, and the patients in the observation group were given perindopril orally, 4mg/time, 1 time/day, on the basis of the control group. The patients in both groups were treated for 3 months.

1.3 Observation indicators

(1) The clinical effects of the two groups of patients after treatment were statistically analyzed. The blood pressure, blood potassium and Aldosterone levels of the patients were controlled. The disappearance of clinical symptoms such as fatigue and dizziness was regarded as significant effect. The improvement of blood pressure, blood potassium, Aldosterone levels and clinical symptoms such as fatigue and dizziness was regarded as effective. The absence of significant changes in blood pressure, blood potassium, Aldosterone levels and clinical symptoms such as fatigue and dizziness was regarded as invalid, Effective rate=(significant+effective)/total number of patients x 100%; (2) Measure the cardiac function indicators of patients before and after treatment, including LVEDD, LVEF, and LVESD levels; (3) During the treatment, adverse reactions such as Hypotension, hyperkalemia, and renal function damage were recorded.

1.4 Statistical Analysis

The data in this experiment were statistically analyzed by SPSS 28.0 software, in which the measurement data were displayed in ± s] table, using t test, the counting data were expressed in percentage, and the comparison was performed by Chi-squared test, with $p<0.05$ as the difference with statistical significance.

2. Results

2.1 Comparison of treatment effectiveness between two groups of patients

The effective rate of treatment in the observation group was 95%, while the effective rate in the control group was 78%, which was significantly lower than the observation group. The difference between the two groups was significant and statistically significant ($p<0.05$). Please refer to Table 1 for details:

Table 1 Comparison of treatment effectiveness rates between two groups of patients (n=80)

grouping	Number of cases	Apparent effect	effective	invalid	Effective rate%
Observers	40	22	16	2	95
controlgroup	40	11	20	9	78
x^2	-	-	-	-	4.910
P	-	-	-	-	0.026

2.2 Comparison of cardiac function indicators between two groups before and after treatment

Before treatment, there was no significant difference in LVEDD, LVEF, and LVESD between the two groups of patients ($p>0.05$). After treatment, the LVEF of both groups of patients increased, but the observation group was significantly higher than the control group, and the LVEDD and LVESD of both groups of patients decreased significantly. However, the observation group was significantly lower than the control group, and the difference between the two groups was statistically significant ($p<0.05$). Please refer to Table 2 for details:

Table 2 Comparison of cardiac function indicators between two groups of patients before and after treatment[$\bar{x}$ ±s]

grouping	Number of cases	LVEDD（mm）		LVEF（%）		LVESD（mm）	
		BEFORE	After treatment	BEFORE	After treatment	BEFORE	After treatment
Observers	40	61.85±3.48	47.69±4.15	32.16±2.14	53.87±5.19	52.63±3.49	34.61±3.14
control group	40	61.87±3.26	56.12±4.06	32.42±2.68	46.19±4.68	52.75±3.16	39.42±3.68
t	-	0.027	9.183	0.479	6.950	0.161	6.289
P	-	0.979	0.000	0.633	0.000	0.872	0.000

2.3 Comparing the incidence of adverse reactions between two groups of patients

During the treatment process, the incidence of adverse reactions in the observation group was 12.5%, while the incidence of adverse reactions in the control group was 15%. There was no significant difference between the two groups and there was no statistical significance ($p>0.05$). Please refer to Table 3 for details:

Table 3 Comparison of Adverse Reaction Incidence between Two Groups of Patients (n=80)

grouping	Number of cases	Hypotension	Hyperkalemia	impaired renal function	Occurrence rate%

Observer	40	2	2	1	12.5
controlgroup	40	3	2	1	15
x^2	-	-	-	-	0.136
P	-	-	-	-	0.711

3. Discussion

ACEI is a kind of drug used to reduce hypertension. Its mechanism of action is to inhibit the activity of angiotensin converting enzyme (ACE), thereby preventing angiotensin I from transforming into angiotensin II, reducing Vasoconstriction and water sodium retention, thereby reducing blood pressure. In addition, ACEI can also promote the improvement of glomerular filtration rate, reduce Proteinuria and kidney damage [3]. Spironolactone is a Diuretic. Its mechanism is to prevent the reabsorption of sodium ions and water in the kidney, thereby increasing urine output, reducing water and sodium retention, and reducing blood volume and blood pressure. It mainly acts on the distal convoluted tubules and collecting ducts of the kidneys, inhibiting the transport of sodium and potassium, and promoting the excretion of sodium and water [4].

To sum up, the combined use of ACEI and Spironolactone is an effective method to treat PA patients. They have the advantages of improving the therapeutic effect, improving patients' cardiac function, and high safety, and can be widely used in clinical practice.

References

[1] Guo JH. Observation on the efficacy of ACE inhibitor combined with Spironolactone in the treatment of non adenoma primary Hyperaldosteronism [J]. Medical Theory and Practice, 2020,33 (19): 3208-3209.

[2] Li BB, Tian Y, Liu DK, Chu QF. The efficacy of benazepril combined with Spironolactone in the treatment of non adenoma PA patients [J]. Journal of Heze Medical specialty, 2021,33 (04): 9-12.

[3] Tan XQ, Huang GQ. The efficacy of Nifedipine sustained-release tablets combined with Spironolactone in the treatment of primary Hyperaldosteronism [J]. Practical Clinical Integrated Traditional and Western Medicine, 2021, 21 (21): 134- 135+143.

[4] Wang F, Ren HQ, Shen XB, et al Clinical efficacy of perindopril combined with Spironolactone in the treatment of non adenoma primary Hyperaldosteronism [J] Progress in Modern Biomedical Sciences, 2018,18 (7): 1302-1305.