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Effects of Muscle Inositol on Fasting Blood Glucose in Patients with type 2 Diabetes, Blood Glucose 2 h after Meal, and Glycosylated Hemoglobin

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Abstract: Objective: To investigate the effects of muscle inositol on fasting blood glucose (FBG), postprandial 2 h blood glucose (2 h PG) and glycosylated hemoglobin (HbAlc) in patients with type 2 diabetes. **Methods:** Ninety patients with type 2 diabetes were divided into observation group and control group, 45 cases each. In the observation group, muscle myo-inositol was added to the conventional treatment of diabetes, and the control group was treated with conventional diabetes. The clinical efficacy of FBG in 2 groups was compared between the two groups. The proportion of adverse reactions in the two groups was compared. The changes of FBG, 2 h PG, HbAlc, adiponectin and serum inflammatory factors were compared before and after treatment. **Results:** The effective rate of FBG and 2 h PG in the observation group was significantly higher than that in the control group ($P < 0.05$). There was no significant difference in the number of patients with adverse reactions in the two groups ($P > O.05$). After treatment, 2 The FBG, 2 h PG and HbAlc were significantly lower than those before treatment, and the FBG, 2 h PG and HbAlC decreased significantly in the observation group than in the control group ($P < 0.05$). The level was significantly higher than that before treatment. The indexes of serum inflammatory factors such as TNF-α and IL-6 were significantly lower than those before treatment. The increase of adiponectin and the decrease of serum inflammatory factor index in the observation group were significantly greater than those in the control group. ($P < 0.05$). **Conclusion:** Muscle inositol is effective in the treatment of type 2 diabetes, which can reduce serum inflammatory factors, FBG, 2 hPG and HbAlc.

Keywords: Myo-inositol, Type 2 Diabetes Mellitus, Fasting Blood Glucose, Postprandial, 2 H Blood Sugar, Glycated Hemoglobintype

Introduction

Diabetes is a chronic non-communicable disease, mainly caused by genetic and environmental factors [1]. Among them, the main features of type 2 diabetes are the impaired secretion function of islet B cells and the progressive increase of insulin resistance. Usually, patients do not need to rely on insulin, but oral hypoglycemic drugs to control blood sugar, so type 2 diabetes is also called non-type. Insulin dependent diabetes [2]. Daily basic treatments require exercise and a strict diet, while medication and blood glucose monitoring are also important in treatment. The main purpose of clinical treatment is to improve the function of B cells, reduce insulin resistance, and improve insulin sensitivity [3].

Inositol is a less used sugar alcohol, similar to the structure of glucose, present in a variety of foods, but at a lower concentration [4]. Theoretically, inositol may have 9 isomers, but now only four species are found in nature. Among them, muscle inositol is the most common in nature, and muscle inositol is the most abundant inositol in the human body (It accounts for more than 90% of the total inositol) [5]. Epimerase determines the physiological distribution of muscle inositol and D-inositol, as well as its physiological function [6]. Muscle inositol is involved in glucose transporter activation and glucose utilization. Muscle inositol has been shown to be the second messenger of insulin. [6] It has also been found that supplementation with muscle inositol regulates glycolipid metabolism, and glycolipid metabolism is closely related to T2D. Related [7]. This study focuses on exploring whether the use of muscle inositol on the basis of clinical use can effectively help patients lower their blood sugar.

1 data and methods

1.1 General Information

200 patients with type 2 diabetes who were admitted to our hospital from October 2016 to October 2017 were randomly divided into observation group and control group. In the observation group, 54 males and 46 females, aged 28-77 years, mean (49.83±4.27) years old; 53 males and 47 females, aged 27-79 years, mean

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(48.39±5.94) years old. There were no significant differences in gender, age structure, and duration of disease between the two groups (P>0.05). Inclusion criteria [8]: 1 meet the diagnostic criteria for type 2 diabetes. Exclusion criteria [9]: 1 patients with severe diabetic complications; 2 patients with major organ dysfunction such as heart, liver, kidney, gastrointestinal tract; 3 patients with a history of severe hypoglycemia; 4 serious heart, Patients with cerebrovascular disease; 5 patients who are pregnant or lactating; 6 patients with a history of drug allergy or drug intolerance. The ethics committee of the hospital has approved the study, and the study has obtained the consent of patients and their families.

1.2 Methods

Both groups of patients were treated by clinically experienced doctors after admission, and both blood glucose levels and body mass index were required. treatment

At the time, both groups of patients were treated with a combination of life treatment and medication, and the diet was strictly controlled according to the doctor's instructions, and reasonable exercise was performed. For medical treatment, routine symptomatic treatment is given, and hypoglycemic drugs are taken to control blood sugar. The drug treatment was: metformin, 5 g / time, 2 times a day; acarbose, 1 g / time, 3 times a day. This dose is the initial dose and is adjusted based on the patient's blood glucose changes during the course of treatment. On this basis, the patients in the observation group were treated with muscle inositol 2 g/time, once a day, and taken half an hour before each breakfast.

1.3 Observation indicators

1 Two groups of FBG and 2 hPG were used to compare the clinical efficacy of the two groups; 2 compare the proportion of adverse reactions such as hypoglycemia and edema in the treatment of the two groups; 3 compare the FBG and 2 hPG of the two groups before and after treatment. HbAIC, in contrast to the efficacy; 4 compare the effects of different treatments on adiponectin and tumor necrosis factor-α (TNF-α), interleukin-6 (IL-6) and other serum inflammatory factors.

1.4 evaluation criteria for efficacy [10]

According to the patient's fasting blood glucose level and 2 h postprandial blood glucose value, the clinical efficacy was divided into markedly effective, effective, and ineffective. Markedly effective: fasting blood glucose dropped below 7.1 mmol/L or decreased by 30%, blood glucose dropped below 8.3 mmol/L or decreased by 30% after 2 hours; effective: fasting blood glucose dropped below 8.2 mmoL/L Or decreased by 10% to 29%, blood glucose decreased to 10.0 mmol/L or decreased by 10% to 29% 2 hours after meal; invalid: no change in fasting blood glucose or less than 10%, no change in blood glucose after 2 hours of meal or Decrease by less than 10%. The total effective rate is calculated by the number of effective cases + the number of valid cases.

1.5 statistical analysis

Data were analyzed by SPSS 19.0 statistical software. The measurement data were expressed by mean ± standard deviation. The t test was used for comparison. The count data were compared by x2 test. P<0.05 was considered statistically significant.

2 results

2.1 Comparison of clinical efficacy between 2 groups of patients

The total effective rate of fasting blood glucose and 2 h postprandial blood glucose in the observation group was significantly higher than that in the control group (P<0.05).

2.2 Comparison of adverse reactions in 2 groups of patients

Both groups of patients had adverse reactions such as hypoglycemia and edema during the treatment, but the incidence of adverse reactions in the two groups was not significant.

The difference was (P>0.05).

2.3 Comparison of FBG, 2 hPG and HbAlC before and after treatment in 2 groups of patients

After treatment, the levels of FBG, 2 hPG, and HbAlC in the two groups were significantly lower than those before treatment (P < 0.05), and the patients in the observation group.

The decrease of FBG, 2 hPG and HbAlc was significantly greater than that of the control group (P<0.05).

2.4 Comparison of the effects of different treatments on adiponectin and serum inflammatory factors

After treatment, the levels of adiponectin in the two groups were significantly higher than those before treatment. The indicators of serum inflammatory factors such as TNF-Q and IL-6 were significantly lower than those before treatment. The increase of adiponectin and the decrease of serum inflammatory factors were observed in the observation group. The amplitude was significantly greater than that of the control group (P<0.05).

3 Discuss

Diabetes is a metabolic disease characterized by hyperglycemia. The main causes of hyperglycemia are insulin secretion defects and impaired biological effects of insulin, and there are some cases in which both are the same. If the hyperglycemia phenomenon persists for a long time, it may easily lead to dysfunction of organs such as heart, kidney, and eyes, as well as chronic damage such as vascular nerves. Type 2 diabetes has a clear genetic predisposition, the main

cause is insulin resistance and insulin secretion defects [11]. Insulin resistance means that the patient is not sensitive to insulin, which is closely related to heredity and her environment. In the early stage of the disease, in order to alleviate the blood sugar drop, the patient's islet B cells secrete more insulin. As the disease progresses, islet B cells may have dysfunction. These abnormally functioning islet 13 cells secrete insulin, which is insufficient to maintain blood glucose at a normal level. Peripheral tissue has reduced glucose uptake, utilization and storage efficiency, and inhibits hepatic glucose output. The role of the continually weakening, so that blood sugar is rising, there will be obvious diabetes symptoms [12]. Insulin resistance is always an important factor in the development and progression of type 2 diabetes. Therefore, improving insulin sensitivity and reducing insulin resistance are particularly important in the treatment process. However, it is worth mentioning that there are some special cases in the treatment of type 2 diabetes. Even if hypoglycemic drugs and insulin are used, the islets cannot be made. The function of the cells is improved, which is very unfavorable for treatment. Therefore, the improvement of insulin resistance during the treatment process also requires the protection of islet B cells. Both metformin and acarbose are commonly used drugs for diabetes, which effectively reduce or delay the absorption of glucose to lower blood sugar and achieve the effect of treating diabetes.

The results of this study showed that patients treated with muscle inositol, FBG, 2 hPG, HbAle decreased more than patients who only received conventional drug therapy, the treatment effect of fasting blood glucose, 2 h postprandial blood glucose was significantly higher than Patients who are routinely treated. Muscle inositol plays an important role in the treatment process, and the improvement of insulin resistance optimizes the therapeutic effect, so that the ability to treat glucose is improved, thereby lowering blood sugar. A decrease in blood glucose also causes a decrease in insulin secretion levels, thereby improving pancreatic islet p cells and protecting islet p cells. The study also found that patients treated with muscle inositol had a significant increase in adiponectin levels after treatment, suggesting that muscle inositol can directly act on lipid metabolism-related enzymes, activate and transfer fat during treatment. Cells that increase the expression level of adiponectin, thereby reducing insulin resistance. The serum inflammatory factor index was significantly lower than before treatment and was lower than patients who were not treated with muscle inositol. The inflammatory response negatively affects islet B cells and promotes their damage or apoptosis. Muscle inositol can effectively inhibit the inflammatory response and exert anti-inflammatory effects by improving the level of adiponectin and reducing the level of inflammatory factors during the treatment process, thereby protecting the islet B cells, thereby improving the function of islet B cells and improving insulin sensitivity. Sex, make it functional.

In summary, in the treatment of type 2 diabetes, muscle inositol can exert significant effects, effectively protect islet B cells, promote cell function improvement and recovery, improve insulin resistance, insulin sensitivity, and reduce patients' FBG, 2 hPG, HbAlC indicators, worthy of clinical application.

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