



# The Value of Low Glycemic Index Diet for the Treatment of Gestational Diabetes and Its Complications

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**Abstract.** From the current domestic and foreign major medicine, health research journals on the “hypoglycemic dietary index treatment of gestational diabetes and its complications” research literature, through statistical sorting, inductive analysis of the medical field of hypoglycemic dietary index for diabetes and its complications treatment value research direction, content, method, reflect the medical field of hypoglycemic index dietary treatment value of diabetes and its complications and research results, provide academic clues for subsequent research. Studies found: in clinical use of low glucose index diet to regulate blood sugar concentration can reduce the number of patients taking hypoglycemic drugs (hypoglycemic drugs easy to cause fetal deformity, and has limitations), this can achieve the effect of treating diabetes, can also reduce drugs for patients and fetal side effects, so as to reduce adverse pregnancy outcomes. At the same time, the promotion of hypoglycemic index diet in the society can improve the public’s awareness of healthy diet, so as to fundamentally solve a series of diseases caused by unscientific nutritional intake.

**Keywords:** Hypoglycemic index diet · Diabetes mellitus and its complications · Literature review

## 1 Introduction

Diabetes is an ancient disease, as early as 400 BC, in China’s earliest medical skills “Huangdi Neijing Su Q” and “Lingshu” recorded the “thirst elimination”, that is, we are now known as diabetes.

In 1674, Britain discovered urine sweet and named it diabetes. With the development of science and technology, people have discovered that “elevated blood sugar” is the basic feature of this disease. But the name “diabetes” has not changed, which is why diabetes comes. As can be seen from the early literature, diabetes was first rooted in economically and culturally developed countries and regions. With the continuous improvement of people’s living standard, the incidence of diabetes also shows a sharp increase trend [1]. In recent years, diabetes has become a frequently occurring disease, whether in developed countries or developing countries, it has become or is continuing

to become the third most serious chronic non-communicable disease after cancer, cardiovascular and cerebrovascular diseases, causing great harm to people's physical and mental health. It has been listed by the World Health Organization (WHO), as one of the three stubborn diseases in the world. Gestational diabetes is a common kind of diabetes, which is also abnormal blood glucose metabolism in pregnancy. There are two kinds of diabetes in women during pregnancy, one is the diagnosis of diabetes before pregnancy, called "diabetes with pregnancy" before pregnancy; the other is diabetes with normal glucose metabolism or potential decreased glucose tolerance, or diagnosed during pregnancy, also known as "gestational diabetes (GDM)". More than 80% of pregnant women with diabetes have GDM, and they will increase significantly in recent years [2]. GDM is mainly due to the hormone changes in pregnant women during pregnancy, which makes the effect of insulin in promoting glucose absorption and utilization reduced, resulting in difficulties for the body to control blood glucose levels and cause GDM. If the patient cannot actively control the blood glucose index during the disease, it is easy to lead to polyhydramnios fluid, premature rupture of membranes, pregnancy hypertension and postpartum infection and other complications, which will threaten the health of both the pregnant woman and the fetus [3]. So what are the academic contributions to the study of "hypoglycemic index dietary treatment of gestational diabetes and its complications" in medical research? Through medicine, health research in major journals about "hypoglycemic index dietary treatment of gestational diabetes and its complications" research literature statistical collation inductive analysis reflects the medical field "hypoglycemic index dietary treatment of gestational diabetes and its complications" research progress and academic dynamics, provide academic clues for follow-up research.

## 2 The Definition of a Low Glycemic Index Diet

Data speaking, if the glycemic index of a food is  $<55$ , such food can be considered as a low glycemic food [4]. Low glycemic index foods can reduce the increase in blood glucose and insulin, promote more fat oxidation, and reduce fat genesis. Hypoglycemic index diet refers to the dietary structure of mainly hypoglycemic food. Its dietary structure is mainly fish, fruits, vegetables, nuts and whole grains. It can also include lightly processed oatmeal, almonds, brown rice, beans, legumes and healthy oils represented by olive oils. Such foods have low sugar content and a strong sense of fruit belly.

## 3 Literature Statistics

Chinese literature comes from Wanfang Data Knowledge service platform. The Chinese literature uses "low glycemic index diet" and "gestational diabetes" as "abstract, title, keywords", and a total of 15 relevant research documents by using an exact search (from 2010 to 2022). The English literature is mainly obtained from OALib. The English literature uses the keywords "Low glycemic index food dishes" and "gestational diabetes mellitus", with 323 relevant research literature retrieved (from 2016 to 2019) available.

### 3.1 Domestic and Foreign Research History

The earliest recent identity research literature is published by Liang Weihua and Liang Yingying in 2010 “dietary carbohydrate, blood glucose load on gestational diabetes pregnant women”, its main research content is: explore the dietary carbohydrate, blood glucose load on pregnant women with gestational diabetes (GDM), finally concluded that high food intake and low food intake may be an external factor of GDM [5]. This shows that the early researchers studied the diet or not to determine whether it was the onset of gestational diabetes because of the master, and they did not realize that you can treat gestational diabetes by controlling your diet. On September 28, 2015, Wu Ying and Zeng Jing published “The positive role of low glycemic index diet in the nutritional treatment of gestational diabetes” is to really start to study whether the low glycemic index diet is of therapeutic value for gestational diabetes, It is concluded that by using low GI/GL foods (GI is used to measure the extent to which a certain food or dietary composition affects blood glucose, GL combines the quantity and quality of carbohydrates, Quantitative determination of the effect of overall food or dietary patterns in raising blood glucose) Nutritional interventions are added to the current routine nutritional treatment program, Simultaneous quantitative control of total dietary energy and glycemic response effects, Can more effectively control blood glucose in patients with GDM, To reduce the occurrence of complications [6]. The literature published after this is also based on this research direction. As early as 2006, some people abroad proposed a similar concept as the “low glycemic index diet”. In 2006, given by the Jiménez-Cruz, A.; Manuel Loustaunau-López, V.; Bacardi-Gascón, M’s “The use of low glycemic and high satiety index food dishes in Mexico: a low cost approach to prevent and control obesity and diabetes” cited “hypoglycemia and high food” as a low-cost way to prevent and treat diabetes. While being produced in 2019 by Antonela Lezo, Clara Monzeglio, Concetta Finocchiaro, Debora Fedele, Ezio Ghigo, Filomena Leone, Ilaria Goitre, Simona Bo, Valentina Ponzo The published “Diet-Gut Microbiota Interactions and Gestational Diabetes Mellitus (GDM)” illustrates the treatment of gestational diabetes through a possible dietary intervention in the gut microbiota.

### 3.2 Research Status and Comparison at Home and Abroad

#### 3.2.1 Domestic Research Status

According to all the Chinese literature, The recent study of the value of low glycemic index diet for the treatment of gestational diabetes is summarized in the following aspects: First, Patients with gestational diabetes were randomly divided into experimental and control groups, By comparing the glycemic index [fasting glucose (FBG), 2 h postprandial glucose (2 h PG), insulin resistance index] and pregnancy complications rates between the two groups, It was found that by using the experimental group, after the hypoglycemic index dietary treatment, All three indicators were lower than the control group, And the incidence of pregnancy complications in the experimental group was significantly lower than that in the control group. It is concluded that gestational diabetes patients in the process of nutritional treatment intake hypoglycemia index diet can maintain the body demand for nutrition, and can better control the blood glucose index, can

regulate the body's insulin resistance state, reduce the incidence of pregnancy complications, ensure the safe delivery, has clinical reference and promotion value [7]. Second, Patients with gestational diabetes were randomly divided into experimental and control groups, Computational analysis of fat, protein, carbohydrates, total energy intake, complication rate, satisfactory nutritional treatment intervention, To evaluate fasting glucose and 2 h postprandial glucose levels before and after the nutritional therapy intervention, Thus, to evaluate the effectiveness of low glycemic index diet in the nutritional treatment of patients with gestational diabetes, The experimental results show that, The test group had more fat intake than the reference group, The carbohydrate intake was less than the reference group, Protein intake and total energy intake in the test group were not very different from the reference group. Trial group to carry out nutrition treatment intervention after fasting blood glucose than reference group difference is not obvious, test group 2 h after the meal, the reference group, reduced complications, test group satisfaction is significantly higher than the reference group, therefore, to gestational diabetes patients in the nutritional treatment of hypoglycemic index dietary nutrition intervention effect is better [8]. Third, by giving control group patients conventional diet intervention, observation group give low glycemic index dietary intervention, compare the difference of blood glucose index, lipid index and insulin resistance index before and after intervention, the results showed that the observation group patients after intervention index is significantly lower than the control group, and observe the incidence of adverse maternal and infant outcomes, significantly lower than the control group [9]. Fourth, there are many similarities between the main characteristics of gestational diabetes and the metabolic syndrome. For patients with gestational diabetes, hypoglycemic and regulation of blood lipid indicators should pay equal attention. Hypoglycemic index diet not only has the effect of reducing blood sugar, because it is a low-fat food and contains a lot of crude fiber, it is also the first choice for lowering blood lipid, it can achieve hypoglycemic and fat regulation, weight control together, can reduce the level of insulin resistance in gestational diabetes, and reduce pregnancy complications and complications [10].

### 3.2.2 Foreign Research Status

Foreign research on this topic is earlier, by consulting foreign literature, the recent research status is summarized as follows: first, eating fruit salad, whole wheat bread and beans have the highest satiety, and these foods belong to low glucose index diet, and energy intake after eating these combination of food is low, therefore, low GI and high SI culture based diet may be a low cost method to prevent and control obesity and diabetes, this method may be cost-effective in developing countries [11]. Second, the first-line approach to treat gestational diabetes mellitus (GDM) is medical nutritional therapy [12]. The composition of the gut microbiota in pregnant women changes before or after the onset of GDM, and a powerful regulator of it is the diet, which is known to have a large impact on host insulin resistance and inflammatory responses. However, considering the potential impact on maternal and neonatal health, the study of regulating maternal gut microbiota through dietary intervention to treat gestational diabetes is not of clinical promotion value [13].

### 3.2.3 Comparative Analysis

Through the analysis of 15 Chinese literature in Chinese for “hypoglycemic index dietary value for treating gestational diabetes” research mainly to compare the physical indicators and the incidence of various adverse pregnancy outcomes to judge hypoglycemic index diet for gestational diabetes treatment value, consistent conclusion: hypoglycemic index diet in the nutritional treatment of gestational diabetes application value, have clinical promotion value. Through the analysis of foreign literature, it can be concluded that foreign countries pay more attention to the research of what factors that affect the human body so as to achieve the treatment of gestational diabetes. On this point, I think the researchers in our country are more concerned about which factors in the body are affected by the low glycemic index diet to achieve the final therapeutic effect. Among them, 12 literatures studied on the value or effect of low glycemic index diet in nutritional treatment of gestational diabetes. There are two articles on the application status of different dietary patterns in patients with gestational diabetes, One explored the positive role of a low-glycemic index diet in the nutritional treatment of gestational diabetes. Because from a scientific point of view, only after profound research in this area can a more reasonable diet structure be deployed to achieve the best therapeutic effect.

## 4 Conclusion

Gestational diabetes during the period of low glucose index diet can reduce fasting blood glucose, 2 h postprandial blood glucose, insulin resistance index and the incidence of pregnancy complications, it also can scientific deployment of fat, carbohydrate, protein and other nutrients intake, not only can provide pregnant women and fetus sufficient calories and nutrients, and can effectively control blood sugar levels, reduce the emergence of complications. The intervention of human gut microbes to treat gestational diabetes may become a new topic in future research.

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