

Whey Protein Supplements for Patients with Type 2 Diabetes Mellitus - A Mini Review

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Received: February 25, 2020; **Published:** September 29, 2021

Abstract

Type 2 diabetes mellitus is a global problem. The search for therapeutic alternatives is a pressing need and the use of dietary supplements is one of the possible options. Among several food supplements, those based on whey protein are among the most studied. This mini-review aims to discuss the physiological mechanisms and the clinical trials that support the use of whey protein supplements in patients with DM2.

Keywords: *Diabetes Mellitus (DM); Type 2 Diabetes Mellitus (T2DM); Protein Supplements*

Diabetes Mellitus (DM) is a pandemic, with approximately 463 million cases worldwide [1]. Type 2 Diabetes Mellitus (T2DM) is responsible for 90 - 95% of DM cases [2]. Within this context, the search for therapies for T2DM treatment is increasing. The use of dietary supplements is one of the therapeutic alternatives that has been researched with to improve the treatment of patients with T2DM. Whey Protein supplements, a kind of protein supplement whose main indication is to complement the protein quota of athletes who desire muscle hypertrophy, are between the most used protein supplements worldwide [3]. They are included in group A supplements according to the Australian sports institute classification, therefore its use is considered to be effective, safe and evidence based [4]. What we call whey protein is a mixture of several isolated proteins present in whey, contained in the liquid supernatant obtained during cheese production [3,5]. Among the proteins present in its composition are Lactoglobins, Immunoglobulins, Lactoferrin, Lactoperoxidase and Albumin, which make whey protein a very rich compound in essential amino acids (AAE) of high biological value, with amino acids of the branched-chain (AACR) and Cysteine [3,5]. In clinical practice, there are 3 types of whey protein commercially available: the concentrated form, which has varying amounts of protein (up to 85%), associated with a varying amount of carbohydrates and fats; the Isolated form, which has more than 90% protein, with almost total removal of fats and carbohydrates, and the hydrolyzed form, with protein concentration equal to that of the isolated form, however, with the advantage that the proteins are already partially pre-digested, which favors even faster absorption, in addition to the total absence of carbohydrates in its formulation, such as lactose [5]. This form reduces the risk of food intolerances, especially lactose intolerance and allergic reactions, being especially suitable for populations at risk for these events.

The interest in the use of whey protein in the treatment of type 2 Diabetes increases when a bench study demonstrated an increase in the production of GLUT 4, a protein responsible for insulin-stimulated glucose transport into skeletal muscle and adipose cells, increasing cellular uptake of glucose [6]. Then, another bench study showed that two peptides derived from B-lactoglobulin, one of the proteins with the highest concentration in whey protein composition, had an inhibitory action on the DPP IV enzyme, causing an increase in circulating levels of GLP1, stimulating insulin production and blocking glucagon production, which is known to have hypoglycemic effects [7]. From that point on, some clinical studies were carried out to corroborated these findings. In a small clinical study with 15 patients with DM2, supplementation with Whey Protein before meals, at a dose of approximately 50 grams, resulted in delayed gastric emptying, increased GLP1 secretion and decreased postprandial glycemia [8]. This study suggested another possible hypoglycemic mechanism of whey

protein supplementation, gastric emptying slowing. In a review, Marathe and colleagues confirmed the importance of delayed gastric emptying to control postprandial blood glucose and the potential of using protein supplements as a strategy to delay gastric emptying [9]. In another clinical trial with 56 patients with DM2 and overweight, divided into 3 groups, eating isocaloric diets with 1500 Kcal/day, Jakobovits and colleagues showed greater weight loss, associated with additional gains in preserving lean mass and improved glycemic control, in the group of patients who were supplemented with 42 grams of protein (28 grams of whey protein) for breakfast, when compared to the group that ingested a smaller amount of protein (13 grams) and the group that ingested 42 grams of protein from other protein sources [10]. In a meta-analysis with 9 studies with patients with DM2, overweight and/or obesity, greater weight loss, decreased body fat and glycemic levels were evidenced in patients who substituted a meal for whey protein intake, reinforcing the possibility of using whey protein supplements as a meal replacement in patients with metabolic disorders who need to lose weight [11]. An important aspect - safety - must be remembered. No serious side effects were observed with whey protein supplementation in patients with T2DM [12]. Focusing specifically on the progression of diabetic renal disease issue, there was no evidence of any increase in that risk in patients with preserved kidney function, defined by a glomerular filtration rate (GFR) greater than 50 ml/min/m² and no albuminuria [13]. These results need to be confirmed in larger, multicenter studies, but the possibility of using whey protein supplements as a complementary therapy to treat such a prevalent and potentially serious disease like type 2 diabetes seems to be very attractive.

Conclusion

In conclusion, the use of whey protein supplements to increase glycemic control in type 2 Diabetes Mellitus seems to be a promising strategy, with efficacy and safety.

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Volume 16 Issue 10 October 2021

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