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Effect of Fenugreek and Psyllium Husk Intake on Obese Patients with Diabetes Mellitus

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Abstract: Obesity and type 2 diabetes mellitus (T2DM) are interlinked metabolic disorders that pose a significant global health burden. Excess body fat contributes to insulin resistance, poor glycemic control, and increased cardiovascular risk. In recent years, functional foods and dietary fibers have gained attention as supportive strategies in diabetes management. Fenugreek (Trigonella foenum-graecum) and psyllium husk (Plantago ovata) are natural sources of soluble fiber and bioactive compounds known to improve glucose and lipid metabolism. This review critically examines the role of fenugreek and psyllium husk in improving glycemic status, lipid profile, insulin sensitivity, and body weight among obese individuals with diabetes mellitus.

Keywords: *Obesity, T2DM-Type 2 Diabetes Mellitus, Fenugreek (Trigonella Foenum-Graecum), Psyllium Husk (Plantago Ovata).*

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I. INTRODUCTION

The prevalence of obesity and diabetes mellitus has increased rapidly across both developed and developing nations. Obesity is a major modifiable risk factor for the development of T2DM due to its strong association with insulin resistance and chronic low-grade inflammation [1]. Managing diabetes in obese patients is complex and requires a multifaceted approach that includes pharmacological treatment, physical activity, and dietary modification. Increasing evidence supports the role of dietary fiber in improving metabolic outcomes. Fenugreek seeds and psyllium husk are widely used traditional remedies that have demonstrated promising antidiabetic and anti-obesity effects in clinical and experimental studies.

II. PATHOPHYSIOLOGY OF OBESITY AND DIABETES MELLITUS

Excess adipose tissue in obesity leads to metabolic dysfunction through altered secretion of adipokines and inflammatory mediators. Elevated levels of free fatty acids and pro-inflammatory cytokines impair insulin signaling pathways, resulting in reduced glucose uptake by skeletal muscle and adipose tissue. This insulin resistance contributes to persistent hyperglycemia and dyslipidemia. Dietary strategies that reduce postprandial glucose excursions and enhance insulin sensitivity are therefore essential for effective diabetes management [2].

III. FENUGREEK: COMPOSITION AND MECHANISM OF ACTION

Fenugreek seeds are rich in soluble fiber, particularly galactomannan, along with saponins, flavonoids, and alkaloids. One of its unique components, 4-hydroxyisoleucine, has been shown to stimulate insulin secretion in a glucose-dependent manner [3]. The viscous fiber content delays gastric emptying and slows carbohydrate digestion, thereby reducing postprandial blood glucose levels. Fenugreek also interferes with intestinal cholesterol absorption, contributing to improved lipid profiles.

IV. CLINICAL EVIDENCE SUPPORTING FENUGREEK USE

Clinical trials have reported significant reductions in fasting blood glucose, postprandial glucose, and glycated hemoglobin (HbA1c) following fenugreek supplementation in patients with T2DM [4]. Additionally, fenugreek intake has been associated with lower serum total cholesterol, LDL cholesterol, and triglyceride levels [5]. Its ability to enhance satiety may also aid in reducing caloric intake and body weight among obese individuals.

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V. PSYLLIUM HUSK: COMPOSITION AND MECHANISM OF ACTION

Psyllium husk consists predominantly of soluble, gel-forming fiber derived from the seeds of Plantago ovata. Upon hydration, psyllium forms a viscous mass in the gastrointestinal tract, which slows gastric emptying and intestinal glucose absorption. This mechanism helps attenuate postprandial glycemic spikes. Psyllium also binds bile acids, promoting their excretion and resulting in reduced serum cholesterol levels [6].

VI. CLINICAL EVIDENCE SUPPORTING PSYLLIUM USE

Several studies have demonstrated that regular psyllium supplementation improves glycemic control in individuals with T2DM. Reductions in fasting blood glucose, postprandial glucose levels, and HbA1c have been consistently reported [6]. Psyllium intake has also been linked to enhanced satiety, improved insulin sensitivity, and favorable changes in lipid profiles, supporting its role in weight and cardiovascular risk management [7].

VII. COMBINED EFFECTS OF FENUGREEK AND PSYLLIUM HUSK

The combined consumption of fenugreek and psyllium husk may provide additive or synergistic metabolic benefits. Fenugreek primarily enhances insulin secretion and modulates carbohydrate metabolism, while psyllium exerts its effects by delaying nutrient absorption and increasing satiety. Together, these fibers may offer improved glycemic regulation, lipid lowering, and weight management in obese diabetic patients.

VIII. SAFETY, DOSAGE, AND PRACTICAL APPLICATIONS

Both fenugreek and psyllium husk are generally well tolerated when consumed in appropriate amounts. Fenugreek is commonly administered in doses ranging from 5 to 25 grams per day, whereas psyllium is typically recommended at 5 to 10 grams daily with adequate fluid intake. Mild gastrointestinal symptoms such as bloating may occur during initial use. Individuals receiving antidiabetic medication should monitor blood glucose levels to avoid potential hypoglycemia.

IX. FUTURE RESEARCH DIRECTIONS

Although existing evidence supports the metabolic benefits of fenugreek and psyllium husk, further long-term randomized controlled trials are required. Future studies should focus on standardized dosing, combined supplementation strategies, interactions with pharmacological agents, and effects on inflammatory markers and gut microbiota.

X. CONCLUSION

Fenugreek and psyllium husk represent effective, low-cost dietary interventions that may complement conventional therapy in obese patients with diabetes mellitus. Their capacity to improve glycemic control, lipid metabolism, insulin sensitivity, and body weight highlights their therapeutic potential. Incorporation of these fibers into daily diets may contribute to better metabolic outcomes and reduced risk of diabetes-related complications.

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