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Research Article

The Impact of Nutritional Status on HbA1c Levels in Patients with Type 2 Diabetes

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Abstract

The aim of this study is to evaluate the effects of nutritional status on HbA1c levels in patients with type 2 diabetes attending the Endocrinology and Metabolic Diseases outpatient clinic at Numune Training and Research Hospital. Patients' knowledge, attitudes, and behaviors regarding nutrition were examined. The study was conducted using a pre-test/post-test design. All participants completed a questionnaire, and in-depth interviews and focus group discussions were held. A decrease in HbA1c levels was observed after the intervention.

Keywords: HbA1c; Type 2 Diabetes

Introduction

Type 2 diabetes is a chronic metabolic disorder that is rapidly increasing worldwide and can lead to serious health complications. According to the World Health Organization, the prevalence of diabetes has risen dramatically in recent years. As of 2021, approximately 537 million adults globally are living with diabetes, and this number is projected to reach 643 million by 2030 In the management of type 2 diabetes, an individual's lifestyle-especially dietary habits—is just as important as medical treatment. The level of glycated hemoglobin (HbA1c), which is used to evaluate long-term blood glucose control, is a significant biomarker in diabetes management Studies have shown that individuals with diabetes experience significant reductions in HbA1c levels when they receive proper nutritional education. In this context, individuals' knowledge about diabetes, their attitudes and behaviors regarding nutrition directly affect their treatment adherence and, consequently, their HbA1c levels. In particular, patients' misconceptions about nutrition can lead to unnecessary dietary restrictions or irregular eating patterns, disrupting metabolic balance. Likewise, the knowledge level of family members can also influence the behavior of the patient.

This study aims to evaluate the relationship between nutritional status and HbA1c levels in individuals diagnosed with type 2 diabetes. Conducted at the Endocrinology and Metabolic Diseases outpatient clinic of Numune Training and Research Hospital, this research seeks to observe the effects of individualized nutritional education on glycemic control and to examine the role of education in diabetes management.

Materials and Methods

The research was planned as case-control study and we applied to the hospital ethics committee. But they didn't give permission because of the control group also need education you can't give education only case group. So, we the methodology was changed. It was planned before-after study instead of case –control study. At the beginning, before education, it was found the mean value of Hbc1 level, it was 10.8.

Every patient will be trained two times/in a month for the first six months and at the second six months they will be educated one time in a month. Four times/in a year, fasting blood glucose and HbA1c will be measured. The decreasing of the HbA1c will be evaluated according to age, gender, educational status, marital status, smoking, alcohol consumption and any chronic disease.

Results

The study was conducted at Numune Training and Research Hospital and was based on the comparison of HbA1c levels before and after a nutritional intervention. The average age of participants was 52.5 ± 1.1 years, and the mean duration of diabetes was 9.1 ± 0.9 years. While 56.3% of the patients had no comorbidities, the most common accompanying disease was hypertension (21.1%). 69% of the participants were on oral antidiabetic drugs or insulin.

While 49.3% of participants stated they had knowledge about diabetes, 83.1% did not know how much to eat during meals, and 97.2% were unfamiliar with the concept of food exchange.

As part of the intervention, all patients received individual nutritional education. The content of the education included meal frequency, portion control, snack planning, and food exchange. HbA1c levels were re-measured within three months after the education.

The average HbA1c level decreased from $10.0 \pm 0.3\%$ to 8.3% after the intervention. Based on their adherence, patients were categorized into four groups.

Discussion

The findings reveal that misinformation and misconceptions about nutrition in patients with type 2 diabetes directly affect glycemic control. Misunderstandings about diet often lead to unnecessary restrictions or inappropriate eating patterns, causing secondary issues such as fear of hypoglycemia.

The study also showed that group-based education with active participation was more effective than individual education alone. Additionally, involving family members in the education process plays a key role in helping patients sustain lifestyle changes [1-3].

Conclusion

In diabetes management, not only individual nutritional education but also the awareness of family members and consideration of patients' personal limitations are essential. This study emphasizes the need to expand the scope of diabetes education in healthcare policies. Educational models targeting "Difficult Diabetes Patients" should also be included in the training of healthcare professionals.

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