
Analysis of the Effects of Community-based Refined Management of Chronic Diseases on Elderly Patients with Diabetes

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Abstract: *Objective:* To explore the effectiveness of community-based refined management of chronic diseases when applied to elderly patients with diabetes, and to analyze its impact on patients' blood sugar, glycosylated hemoglobin levels, probability of hospitalization for complications, and risk of death. *Methods:* 100 elderly patients with diabetes who visited the outpatient clinic of our hospital from January 2023 to December 2024 were selected as the research subjects, divided into two groups, the management group and the control group, with 50 people in each group. The control group underwent routine blood sugar adjustment, and the management group implemented community-based refined management intervention for chronic diseases. The fasting blood sugar, 2-hour postprandial blood sugar and glycosylated hemoglobin levels of the two groups of patients before and after management were comparatively analyzed, and data related to complications, hospitalization rate and death risk after management were collected. *Results:* After refined management intervention, the fasting blood sugar, 2-hour postprandial blood sugar and glycosylated hemoglobin levels of elderly patients with diabetes in the management group were significantly lower than before management and lower than those in the control group ($p < 0.05$). After management, the blood sugar standard rate of the management group reached 78.00%, the hospitalization rate for complications was 8.00%, and no deaths occurred during the period. After management in the control group, the blood glucose compliance rate reached 52.00%, and the hospitalization rate for complications was 24.00%. No deaths occurred during the period. There was a significant difference in the blood glucose compliance rate and hospitalization rate for complications ($p < 0.05$). *Conclusion:* Refined management of chronic diseases in the community can effectively reduce blood sugar and glycosylated hemoglobin levels in elderly patients with diabetes, improve blood sugar compliance rates, reduce the risk of hospitalization for complications, and ensure the safety of patients. It has the value of clinical promotion and application.

Keywords: Community chronic diseases; Refined management; Elderly diabetes; Blood glucose compliance rate; Hospitalization rate for complications

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1. Introduction

Diabetes in the elderly is a clinically common chronic metabolic disease with a long course and high difficulty in disease control. The patient's blood sugar control status is directly related to the probability of complications and life safety^[1,2]. In current community medical services, routine chronic disease management mostly focuses on basic medication guidance and regular physical examinations. There is insufficient attention to individual patient differences and full-process dynamic management and control, making it difficult to fully stimulate patients' subjective initiative to participate in disease management. As a result, most patients have problems such as irregular medication and inadequate dietary control, which in turn results in poor blood sugar control and a consistently high complication rate. The refined management of chronic diseases in the community of our hospital focuses on formulating personalized management and control plans based on individual characteristics such as the patient's specific condition (blood sugar, blood lipids, blood pressure compliance and complications), living habits, etc., and achieves standardization and personalization of disease management with the help of full-process dynamic monitoring and intervention, which may have a positive effect on improving the quality of diabetes management in the elderly. In recent years, the aging of the population has continued to accelerate, the number of elderly patients with diabetes has continued to rise, and the importance of community chronic disease management services has become increasingly prominent. Exploring more efficient chronic disease management models has become an important direction for the optimization of community medical services^[3,4]. Based on this current situation, this study specifically explores the application effect of community-based refined management of chronic diseases in elderly patients with diabetes. The purpose is to provide relevant reference for the optimization of community chronic disease management, help improve the disease management capabilities of elderly patients with diabetes, and improve their quality of life.

2. Materials and methods

2.1. General information

100 elderly patients with diabetes who visited the outpatient clinic of our hospital from January 2023 to December 2024 were selected as the research subjects, divided into two groups, the management group and the control group, with 50 people in each group, including 27 males and 23 females in the management group, with an age range of 60 to 82 years old, and an average age of (68.56 ± 4.32) years. There were 28 males and 22 females in the control group, with an age range of 60 to 83 years old, and an average age of (68.12 ± 4.45) years.

2.1.1. Inclusion criteria

- (1) Meet the diagnostic criteria for elderly diabetes;
- (2) Have clear consciousness and can cooperate to complete management operations;
- (3) Voluntarily join this study.

2.1.2. Exclusion criteria

- (1) Combined with severe liver and kidney dysfunction;
- (2) Presence of mental illness;
- (3) Combined with malignant tumors.

2.2. Method

In the control group, medication was adjusted according to routine blood glucose at each outpatient visit without detailed management. The management team all implements community-based refined management intervention for chronic diseases.

2.2.1. Personalized assessment and plan formulation stage

A special management team is led by doctors with more than 5 years of experience in diabetes diagnosis and treatment, and its members include nurses and health managers. Physicians use detailed consultations, physical examinations, and laboratory test results to comprehensively understand the patient's course of diabetes, blood sugar fluctuation patterns, underlying conditions, past medication history, and drug tolerance. At the same time, they work with nurses to understand the patient's living habits, family support, and disease awareness through questionnaires and face-to-face communication, and complete complications screening for the patient. Based on the comprehensive assessment conclusions, doctors take the lead in formulating a personalized and refined management plan, clarifying blood glucose control goals, medication strategies, monitoring frequency and intervention focus. At the same time, doctors directly explain the basis, core content and expected results of the plan to patients and their families in detail, patiently answer relevant professional questions such as diagnosis and treatment plans, drug safety, etc., and build a good doctor-patient trust relationship to enhance patients' initial willingness to cooperate.

2.2.2. Full dynamic intervention stage

According to the personalized management plan, the physician takes the lead in implementing the full dynamic diagnosis and treatment intervention:

(1) Fine adjustment of medication

The physician regularly adjusts the medication plan based on the patient's blood glucose monitoring data and adverse drug reaction manifestations. For patients with poor oral hypoglycemic drugs, timely assessment of pancreatic islet function and formulation of an insulin injection plan, while personally demonstrating the correct insulin injection method and dose adjustment method, to ensure the accuracy and safety of medication;

(2) Early screening and intervention of complications

Physicians will conduct special screening for diabetic complications every 6 months, including fundus examination, renal function test and foot examination, etc. to promptly detect signs of early complications and formulate targeted intervention measures, such as adjusting medication regimens for patients with early diabetic nephropathy, guiding high-quality low-protein diet, and carrying out foot intervention for high-risk patients with diabetic foot;

(3) Personalized guidance on diet and exercise

Based on the patient's comorbidities (such as hypertension and coronary heart disease), body mass index and blood sugar fluctuation characteristics, the doctor develops a personalized diet plan to clarify the proportion of daily carbohydrate and protein intake and avoid dietary taboos related to underlying diseases. At the same time, based on the patient's cardiopulmonary function and physical condition, the doctor recommends appropriate exercise methods and exercise intensity. For example, patients with coronary heart disease recommend low-intensity walking, Tai Chi, and clear exercise. Duration and key points of blood sugar monitoring before and after exercise to prevent the risk of exercise-related hypoglycemia;

(4) Dynamic blood sugar monitoring management

The doctor determines the monitoring frequency and monitoring time points according to the patient's blood sugar fluctuations, and instructs patients with large blood sugar fluctuations to increase the frequency of monitoring (such as fasting, 2 hours after three meals, before going to bed), and requires patients to bring blood sugar monitoring records to the hospital for follow-up visits regularly, and doctors dynamically optimize the management plan based on monitoring data;

(5) Health education and psychological counseling

Doctors organize a diabetes health science education lecture every quarter, focusing on professional knowledge such as the clinical value of blood sugar control, key points of complication prevention and treatment, medication misunderstandings, etc. At the same time, in response to patients' anxiety, worry and other emotions, doctors

provide psychological counseling through one-on-one communication to reduce patients' psychological burden and enhance their confidence in disease management. In addition, a telephone follow-up is conducted every two weeks led by a physician to promptly understand the patient's home management situation, symptom changes and medication compliance, solve the diagnosis and treatment-related problems encountered by the patient, and provide targeted guidance.

2.2.3. Consolidation and follow-up stage

Through the analysis of real clinical cases, doctors in-depth explain the importance of adhering to refined management for blood sugar control and prevention of complications, and strengthen patients' awareness of disease management. Guide family members to actively participate in management and supervision, and teach family members how to assist patients in monitoring blood sugar, reminding them to take medication, and identifying symptoms of hypoglycemia. The doctor formulates a long-term follow-up plan, clarifying the follow-up time (1 month, 3 months, 6 months, 12 months after management) and method (telephone follow-up combined with outpatient review). At each follow-up visit, the doctor directly evaluates the patient's blood sugar control, complication progression, and medication safety, and promptly improves the management plan to help patients develop long-term and stable health management habits.

2.3. Observation indicators

According to the blood glucose and glycosylated hemoglobin control requirements for elderly diabetic patients formulated in the Chinese Elderly Diabetes Diagnosis and Treatment Guidelines (2021 Edition), the fasting blood glucose, 2-hour postprandial blood glucose and glycosylated hemoglobin levels of elderly diabetic patients before and after the implementation of community-based refined management of chronic diseases were compared and analyzed, and data related to the blood glucose compliance rate, complication hospitalization rate and death risk after management were collected. Patients are classified according to whether they use drugs with a higher risk of hypoglycemia and their health status is good, moderate, or poor. Among them, patients who do not use drugs with a higher risk of hypoglycemia: the control standards for glycosylated hemoglobin (HbA1c) are: good < 7.5%, moderate < 8.0%, and poor < 9.5%; the control standards for fasting or pre-meal blood sugar are: good Good is 5.0–7.2 mmol/L, medium is 5.0–8.3 mmol/L, and poor is 5.6–10.0 mmol/L; the control standards for blood sugar before bedtime are: good is 5.0–8.3 mmol/L, moderate is 5.6–10.0 mmol/L, and poor is 6.1–11.1 mmol/L. For those who use drugs with a higher risk of hypoglycemia: the control standards for glycosylated hemoglobin (HbA1c) are: good at 7.0–7.5%, moderate at 7.5–8.0%, and poor at 8.0–8.5%; the control standards for fasting or pre-meal blood sugar are: good at 5.0–8.3 mmol/L, medium is 5.6–8.3 mmol/L, and difference is 5.6–10.0 mmol/L; the control standards for blood sugar before bedtime are: good is 5.6–10.0 mmol/L, medium is 8.3–10.0 mmol/L, and difference is 8.3–13.9 mmol/L.

Complications include diabetic peripheral neuropathy, diabetic nephropathy, diabetic retinopathy, diabetic foot, etc.

2.4. Statistical methods

SPSS24.0 was used to analyze the data. The *t* test was used for the measurement data and the χ^2 test was used for the count data. $p < 0.05$ means the difference is very obvious.

3. Results

3.1. Comparison of blood sugar and glycosylated hemoglobin levels of patients before and after refined management

After refined management intervention, the fasting blood sugar, 2-hour postprandial blood sugar and glycosylated hemoglobin levels of the elderly diabetic patients in the management group were significantly lower than those before management and lower than those in the control group ($p < 0.05$), **Table 1**.

Table 1. Comparison of blood glucose and glycosylated hemoglobin levels of patients before and after refined management ($\bar{x} \pm s$)

Group		Fasting blood glucose (mmol/L)	Blood glucose 2 hours after meal (mmol/L)	Glycated hemoglobin (%)
Management group (n = 50)	Before management	8.96 ± 1.23	12.54 ± 1.67	8.72 ± 0.95
	After management	6.58 ± 0.85*#	9.21 ± 1.02*#	6.43 ± 0.68*#
Control group (n = 50)	Before management	8.89 ± 1.18	12.47 ± 1.59	8.65 ± 0.88
	After management	7.92 ± 1.05*	10.83 ± 1.36*	7.81 ± 0.76*

Note: * indicates the comparison with this group before management, $p < 0.05$; # indicates the comparison with the control group after management, $p < 0.05$.

3.2. Analysis of patients' blood glucose compliance rate, complications, hospitalization and death after refined management

After management by the management team, the blood glucose compliance rate reached 78.00%, the hospitalization rate for complications was 8.00%, and no deaths occurred during the period. After management in the control group, the blood glucose compliance rate reached 52.00%, and the hospitalization rate for complications was 24.00%. No deaths occurred during the period. There was a significant difference in the blood glucose compliance rate and hospitalization rate for complications ($p < 0.05$). **Table 2.**

Table 2. Analysis of patients' blood glucose compliance rate, complications, hospitalization and death after refined management [n (%)]

Group	n	Blood glucose target rate	Number of hospitalizations for complications (incidence rate)	Number of deaths (incidence)
Management group	50	39 (78.00)	4 (8.00)	0 (0.00)
Control group	50	26 (52.00)	12 (24.00)	0 (0.00)
χ^2		7.429	4.762	0.000
p		0.006	0.029	1.000

4. Discussion

Elderly diabetes is a chronic metabolic disease, and its treatment and management process is long. The patient's own disease management ability has a very important impact on the effectiveness of blood sugar control and the prevention of complications. Conventional community chronic disease management mostly adopts unified management and control measures, ignoring the individual differences of patients and the importance of dynamic management and control throughout the process, resulting in insufficient subjective enthusiasm of patients to participate in disease management, and making it difficult to effectively improve blood sugar control effects. The refined management of chronic diseases in the community organically combines personalized intervention with full-process dynamic management and control, and carries out targeted management and control intervention based on the specific conditions of patients, which can effectively make up for the shortcomings of conventional management [5].

The results of this study show that after the intervention of refined management of chronic diseases in the community, the fasting blood sugar, 2-hour postprandial blood sugar and glycosylated hemoglobin levels of 50 elderly patients with diabetes were significantly reduced compared with those before management, and the blood sugar compliance rate reached

78.00%. This result shows that refined management of chronic diseases in the community can effectively improve the blood sugar control status of elderly patients with diabetes and increase the rate of blood sugar compliance. The reason behind the analysis is that in the initial stage of implementation of this management model, a personalized management plan is developed through a comprehensive assessment of the patient's condition, so that the management and control measures are more in line with the actual needs of the patient; in the full dynamic intervention stage, the fine adjustment of medication led by doctors can timely optimize the medication plan to ensure the effectiveness of reducing blood sugar, while also relying on diet, exercise and other aspects. Refined guidance to assist in blood sugar control, coupled with strengthened dynamic blood sugar monitoring, can promptly adjust the management plan to ensure the accuracy and effectiveness of blood sugar control; in the consolidation and follow-up stages, by strengthening patients' awareness of disease management and involving family members in supervision, management effectiveness is further consolidated and patients are helped to develop good health management habits. The reduction of blood sugar and glycated hemoglobin levels and the improvement of the compliance rate can effectively reduce the damage of high blood sugar to various organs of the body and provide a basis for the prevention of complications ^[6].

In terms of complications, hospitalization and death, after intervention by community-based refined management of chronic diseases, the hospitalization rate for complications among 50 elderly patients with diabetes was only 8.00%, and there were no deaths. This is mainly because the refined management of chronic diseases in the community focuses on the prevention and early intervention of patients' complications, reducing the risk factors related to complications through personalized diet and exercise intervention, and relying on regular follow-up and examination to detect early signs of complications, and then adopt targeted intervention methods to reduce the risk of complications. In addition, this management model improves patients' disease awareness and self-management ability, so that patients can correctly master the knowledge of complication prevention and emergency treatment methods, and can take timely and effective measures when uncomfortable symptoms occur, reducing the possibility of complications and hospitalization. Complications such as diabetic nephropathy and diabetic retinopathy can pose serious threats to patients' quality of life and life safety. Refined management of chronic diseases in the community can effectively reduce the risk of hospitalization for such complications and ensure patients' life safety ^[7].

From the perspective of management concepts, the refined management of chronic diseases in the community reflects the patient-centered medical service orientation and highlights the dominant and core position of physicians in the management process. This is significantly different from the model in conventional chronic disease management in which nursing intervention is the main means. Relying on solid diagnosis and treatment expertise, doctors can more accurately grasp the patient's condition characteristics, comorbidities, and medication needs, making the formulation of personalized management plans more scientific and targeted. This is also the key reason why this management model can achieve better results ^[8]. This model breaks through the unified and static management and control methods in conventional management. Through dynamic evaluation and plan adjustment led by doctors, management services are more in line with patients' actual diagnosis and treatment needs. At the same time, doctors directly participate in health education, psychological counseling and follow-up intervention, etc., which can answer patients' professional questions in a timelier manner, alleviate patients' worries about diseases and diagnosis and treatment, further improve patients' management compliance, and realize the transformation from passive acceptance of management to active self-management. This physician-led refined management model can not only improve the quality of elderly diabetes management, but also provide reference ideas for the management of chronic diseases in other communities.

In summary, applying physician-led community-based refined management of chronic diseases to elderly patients with diabetes can give full play to the professional diagnosis and treatment advantages of physicians. Through accurate personalized plan formulation, full-process dynamic diagnosis and treatment intervention, and scientific follow-up management, it can effectively improve the blood glucose compliance rate of patients, while reduce the risk of complications and hospitalization, and ensuring the safety of patients' lives. This has a positive effect on improving patients' subsequent recovery conditions and improving the quality of community medical services, and is worthy of

widespread promotion and application in clinical community medical work.

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Disclosure statement

The author declares no conflict of interest.

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