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THE RESULT AND FACTORS AFFECT TO GLYCEMIA MANAGEMENT IN TYPE 2 DIABETES PATIENTS AND KIDNEY DISORDER TREATED IN VINH PHUC GENERAL HOSPITAL, VIETNAM IN 2023

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ABSTRACT

Background: Diabetes is one of the most widespread endocrine disease with increasingly prevalence in developing countries. Kidney disorder is a frequent comorbidity in type 2 diabetic patients. In these patients, there are some particular characters that affect on treatment and prognosis. Verifying these factors can improve the result of treatment.

Objectives: To describe the result of glycemia management in type 2 diabetes patients and kidney disorder treated in Vinh Phuc General Hospital in Vietnam, 2023.

Methods: A cross-sectional study was performed on 123 type 2 patients diagnosed with diabetes and kidney disorder treated in Vinh Phuc general Hospital.

Results: The average of patients age is 70,62 ± 9,62. Average duration of disease is 70,62 ± 9,62. The patienst was treated with insulin isolated is 76,4%. The propotion of target FBG on the first day and 90th is 35,8% and 42,3%. Moderate to good adherence by Morisky scale on the first and 90th elevated from 68,3% to 91,2%.

Conclusions: Type 2 diabetic with kidney disorder in our sample seem to be more frequent in elderly population, have long duration of disease, mostly be treated with insulin isolated. The proportion of target FBG is low. Dietary patterns, physical activity, medication adherence get improve after intervention.

Keywords: Type 2 diabetes, diabetic kidney disease, Vinh Phuc.

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1. INTRODUCTION

Chronic complications of diabetes are systemic in most organs, causing damage to target organs. Among chronic complications, kidney complications due to diabetes are a common complication. The clinical picture is discreet, so it is easy to ignore the initial symptoms. When clinical manifestations appear, kidney function has already improved. decline, quickly leading to irreversible chronic kidney failure [1], [2], [3]. Decreased kidney function will aggravate other complications of diabetes, increase events and mortality. Diabetic nephropathy is one of the microvascular complications occurring at a rate of 20 - 40% [4], [5]. Therefore, early diagnosis of kidney complications due to diabetes is extremely necessary to help detect kidney damage early and provide timely treatment to prevent progression of kidney damage.

The Vinh Phuc Provincial General Hospital has a large volume of patients examined, monitored and treated, but research evaluating the current status of kidney complications in patients with type 2 diabetes undergoing outpatient follow-up at the hospital is still limited. Therefore, we conducted this study to describe the characteristics of blood glucose control in patients with type 2 diabetes with kidney damage treated as outpatients at Vinh Phuc Provincial General Hospital.

2. METHODS

2.1. Study design: A cross-sectional study. During the study period, 123 patients met the selection criteria.

2.2. Research subjects, time and place of study

2.2.1. Study subjects:

The study included type 2 diabetes outpatients with kidney disorders at the Endocrinology Clinic of Vinh Phuc General Hospital.

• Selection criteria: Patients diagnosed with type 2 diabetes and kidney disorders as comorbidity, consented to participate in the study.

• Exclusion criteria**:** Patients diagnosed with other accompanying endocrine diseases; patients with severe, acute or chronic anemia, and chronic diseases; patients diagnosed with urolithiasis.

2.2.2. Study period: The study was conduct from November 1st 2022 to June 30th 2023.

2.2.3. Location of study: The study was conducted in the Endocrinology Clinic of Vinh Phuc General Hospital, Vietnam.

2.3. Sample size and sample selection:

Applying the sample size formula estimates a ratio, based on previous research, the minimum sample size is 114 patients. Using convinience sampling technique, 123 eligible outpatients were reached for data collection process.

2.4. Research criteria and data collection:

All patients are questioned, clinically examined, tested according to a uniform medical sample at the beginning and day 90.

• Interview the patients on demographics, history, time of detection of diabetes.

• Interview the patients on diet, exercise regimen, Morisky scale questions and scoring

• Medical examination records anthropometric information (height, weight, BMI).

• Laboratory and probe record laboratory indicators (glucose, HbA1c, creatinine), total urinalysis, calculation of glomerular filtration rate.

2.5. Data analysis: Data were entered and analysed using IBM SPSS Statistics 22.0

2.6. Research ethics: Consented by the Ethics Council of Vinh Phuc General Hospital.

3. RESULTS

3.1. General characteristics of the subjects studied

Table 1. Demographic information of the sample

Character		Amount (n=123)	%
Sex	Male	91	74,0
	Female	32	26,0
BMI group	<18.5	1	0,8
	18,5-22,9	56	45,5
	>23	66	53,7
Increased waist circumference	Yes	60	48,8
	No	63	51,2
Median age (X±SD) (min – max)		70,62 ± 9,62 (44 - 92)	

Males account for 74%. The average age of the study group was 70,62 ± 9,62. BMI > 23 group has the highest rate (53,7%). Patients with increased waist circumference accounted for 48,8%.

Table 2. Features associated with diabetes mellitus

Character		Amount	Proportion
Duration of diabetes mellitus (years)	≤ 9 years	23	18,7
	> 9 years	100	81,3
	Medium (year) (X±SD) (min -max)	14,2 ±5,0 (4 - 26)	
The duration of kidney disorders	> 12 months	107	87,0
	≤ 12 months	16	23,0
Stage of kidney disorders at the beginning	Kidney damage with normal kidney function	2	1,6
	Kidney function is slightly reduced Kidney slight dysfunction	11	8,9
	Kidney moderate dysfunction	71	57,7
	Kidney moderate- severe dysfunction	28	22,8
	Kidney severe dysfunction	11	8,9
Treatment options			
Blood sugar management therapy	Metformin therapy	19	15,4
	SGLT2 therapy	20	16,3
	Insulin monotherapy	94	76,4

The average duration of diabetes mellitus for the study group was 14,2 ±5,0 years. Patients diagnosed with kidney disorders in over 12 months accounted for 87%. Kidney function decreased by an average of 57,7%. Kidney moderate/severe dysfunction accounted for 22,8%. Severely reduced kidney function accounted for 8,9%. There were 94 patients using insulin alone, accounting for 76,4%.

3.2. Results of glycemic management in type 2 diabetes patients with kidney disorders

Table 3. Fasting blood glucose concentration management results through monitoring

Character		The first time (n=123)		Day 90 (n=123)		p
		n	%	n	%	
Fasting blood glucose concentration management	Reach	44	35,8	52	42,3	< 0,05
	Failed	79	64,2	71	57,7	
Mean fasting blood glucose (FBG) (mmol/l ± SD)		9,18 ± 4,63		7,39 ± 2,66		< 0,05

The difference in the number of patients who reached the fasting blood glucose target at the beginning and at day 90 was statistically significant with p < 0,05. Mean fasting blood glucose at beginning and day 90 differed statistically significant with p < 0,05.

Table 4. Dietand exercise adherence through follow-up

Content	The first time (n=123)		Day 90 (n=123)		p
	n	(%)	n	(%)	
Proper diet	77	62,6	101	82,1	<0,05
Reasonable training regime	83	67,5	100	81,3	<0,05

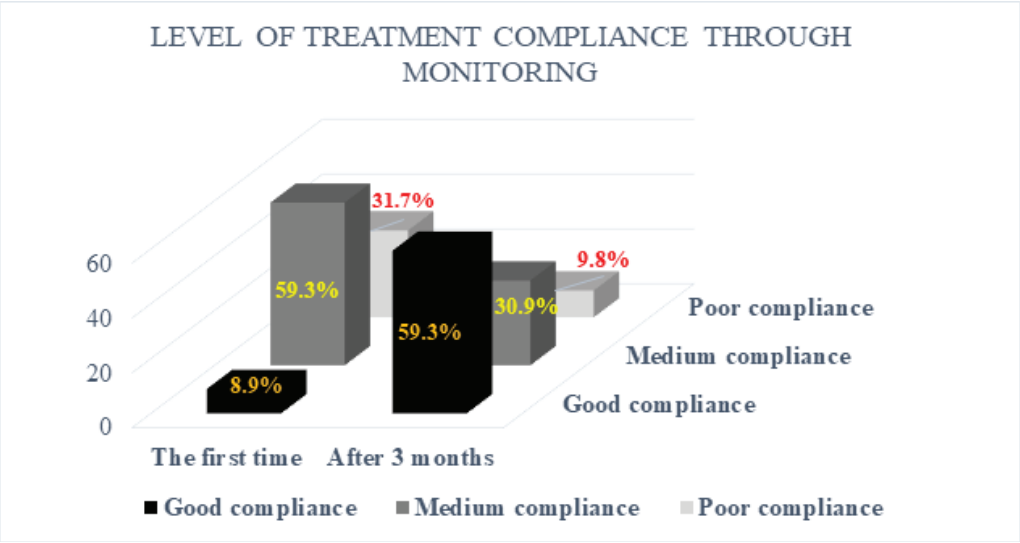
The difference between proper diet and proper exercise regimen between the beginning and day 90 was statistically significant to p<0,05.

Table 5. The results of the patient's assessment of adherence to the use of the drug

Question (each answer yes)	The first time (n=123)		After 3 months (n=123)		p
	n	(%)	n	(%)	
1. Occasionally forgetting to take medication	89	72,3	53	43,1	< 0,05
2. Within 2 weeks, there are days when you forget to take the medicine	47	38,2	38	30,9	> 0,05
3. Gor stop the drug without telling your doctor	79	64,2	51	41,5	< 0,05
4. When you travel or leave home, forget to bring your medication from time to time.	88	71,5	79	64,2	> 0,05
5. Yesterday forgot to use the drug	12	9,8	10	8,1	> 0,05
6. Stop the drug when symptom relief	76	61,8	52	42,3	< 0,05
7. Feel gentle when following the treatment plan.	68	55,3	42	34,1	< 0,05
8. Difficultyremembering to use all medications.	52	42,3	45	36,6	> 0,05

After 3 months, the rate of forgetting to take medication, reducing or stopping medication without informing the doctor, stopping medication when symptoms subside, and finding it troublesome to follow the treatment plan decreased compared to the initial time. This is statistically significant (p<0,05).

Figure 1. Follow-up adherence



There was a statistically significant change in medication adherence at baseline and day 90 with (p<0.05).

Table 7. Results of hypoglycemic events through follow-up

Happening	n	%
Hypoglycemia (< 4.4 mmol/l)	13	10,6

At follow-up, 13 patients had hypoglycemic events, accounting for 10.6%.

4. DISCUSSION

Surveying 123 type 2 diabetes patients who had kidney damage between November 202 and June 2023, we found that type 2 diabetes patients with kidney damage had moderate age High pitcher (70.62 ± 9.62.). This result is similar to previous studies such as those of Dam Thi Huong Lien [3], Khuc Thi Hong Anh [2]. The duration of diabetes mellitus is long (14.2 ±5), the duration of kidney damage mainly > 12 months. This result is consistent with studies as well as the pathophysiological basis that the longer the duration of the disease, the higher the risk of complications. Research by Ahmed Medina et al. kidney complications in type 2 diabetes patients found that the median duration of CKD is 5 years after diabetes detection, with an average annual incidence of 193/10,000 [8]. 76.4% of patients treated with Insuli alone, a ratio similar to Le Van Mo in 96 diabetic nephropathy patients in Kien Giang in 2021 (85%) [4].

In our study, at the baseline the proportion of patients with fasting blood glucose levels reached 35.8%, similar to that of authors Dam Thi Huong Lien (32.4%) [3], higher than the study of author Le Van Mo (24%) [4]. From this, it can be seen that, although fasting glucose control is very important to limit complications, the target rate of achievement in type 2 diabetes patients has very low kidney damage. Through consultation with the treatment regimen, this rate at day 90 increased to 42.3% similar to the results of the nutritional intervention study by author Ong Tu US (47.06%)[5].

Nutrition, exercise, and medication interventions play an important role in achieving treatment goals.

The proportion of patients adhering to diet and exercise regime in our study had similar results to the study of author Nhu Thi Lan Anh (Dietary and exercise adherence levels in our study and the authors were: 62.6% vs 63.5% and 67.5% vs 62.4%, respectively). This result is quite low, which proves that although diet and exercise are an integral part of diabetes guidance, management and treatment, it has not been paid enough attention by both physicians and patients.

Adherence to medication is critical to better treatment goals while reducing treatment costs, especially for patients with chronic diseases. A retrospective study of 11,000 patients found that type 2 diabetes patients with poor adherence to treatment had higher rates of hospitalization and all-cause mortality than patients with good adherence. To assess disease adherence, the study used an 8-question Morisky toolkit assessing drug use[6]. In our study, 8.9% of patients had good adherence according to the Morisky score; 59.3% were moderate adherent, and 31.7% were poorly adherent. This result is similar to Mohamed M. (poor adherence rate is still high) [6]. or Nguyen Thi Phuong Thuy's study , adherence rate Poor value was 32.7%. Among the reasons for reduced adherence to treatment was the proportion of patients who forgot to take the drug, reduced or discontinued when the disease stabilized and forgot Carrying medication while away also accounts for a high proportion (> 60%). Our study had a higher rate of forgetting to carry medication than our authors, Nguyen Thi Phuong Thuy. The reason may be that our patients are older, with much higher rates of insulin use (76.4% vs. 27.3 %), the inconvenience in storage and use of Insulin may be the cause of reduced adherence. Following the guidelines, at day 90 there was a statistically significant improvement in treatment adherence as well as improvement improve problems that reduce adherence to treatment.

Hypoglycemia (OS) is a dangerous and common complication in patients with diabetes mellitus (diabetes), especially in elderly diabetic patients. Statistics from the American Diabetes Association (ADA) show that 2-4% of diabetes deaths annually are OS-related [9]. Through follow-up, in our study, 13 patients had hypoglycemic events accounting for 10.6%. This result is much lower than the study of authors Nguyen Trung Anh et al. on hypoglycemic events in elderly type 2 diabetes patients at Thanh Nhan hospital *(*47.1%) [1] and the study of Chi America (24.76%). However, the authors' study was conducted on inpatients, with long follow-ups , with no follow-up intervention so the ratio is higher. In addition, in the study of author America Chi, the rate of excessive dieting accounted for a high proportion (61.9%). This suggests that proper diet plays an important role in both achieving the goal of controlling blood glucose and limiting hypoglycemic events.

5. CONCLUSION

The study of 123 type 2 diabetes patients with kidney damage showed that patients with high average age, long duration of the disease, were mostly treated with insulin alone, the rate of successful glycemic control in these patients is not high.

There was a meaningful improvement in results in blood glucose control, diet, exercise regimen, and medication adherence at baseline, and 90 days after consultation and treatment management. Hypoglycemia in follow-up had a prevalence of 10.6%.

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