TREATMENT METHODS IN HOSPITALIZIED PATIENTS WITH T2D – A RETROSPECTIVE STUDY

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Diabetes mellitus represents one of the tremendous public health problems around the whole world, imposing a global burden on the health system, leading to a high degree of disability and premature death. The main purpose of diabetes treatment is to prevent or postpone the onset of chronic complications and to maintain a high quality of life. Our study realized in the Endocrinology Department of Timofei Moşneaga Republican Clinical Hospital is a retrospective cohort study. Depending on the obtained values such as age, sex, HbA1c, as well as outpatient treatment regimens and outpatient treatment recommendations, all the data were classified into various groups and analyzed. In the examined group the patients ranged from 40 to 80 years the disease duration has an average of 11.1 ± 5 years. The distribution by gender criteria determined that the study group was relatively proportional. In the study group the HbA1c value was higher than 8% in 77% of cases and only 9% of patients reached the target of HbA1c below 7%. Inpatient treatment schemes differ from inpatient ones, with a predominance of combined regimens with oral hypoglycemic agents and insulin. In conclusion, it is certain that in order to prevent chronic complications and increase life expectancy, an individualized approach is required both as therapeutic objectives and as a treatment strategy.

Keywords: diabetes, HbA1C, treatment, goals.

INTRODUCTION

Diabetes mellitus represents one of the biggest public health problems in the whole world, imposing a global load either on the health system or on socio-economic development[5, 7]. Type 2 diabetes mellitus (T2D) is a chronic pathology, which incidence has increased 4 times in the last three decades[6, 11, 12], thus it has reached the proportions of a global and national pandemic[11].

The Republic of Moldova is registering the rise in the number of people with diabetes as well, so in the period from 2009 to 2019 year the number of people with diabetes had increased from 55,023 to 120,493 people so practically has doubled[2,3].

The main objective in diabetes treatment is to prevent or postpone the onset of chronic complications and to maintain a high quality of life[1, 8, 9, 10]. In order to reduce the risk of chronic complications, it is evident that a multifactorial therapeutic approach is needed which should influence on several risk factors, such as hyperglycemia, dyslipidemia, hypertension and obesity, etc.

T2D treatment represents a problem with many variables and unknowns in the course of many years. The American Diabetes Association (ADA) and the European Diabetes Association (EASD) recommend the individualized management of hyperglycemia in people with T2D[4].

The goal of our research was a retrospective analysis of the treatment schemes applied to people with T2D hospitalized in the Republican Clinical Hospital "Timofei Moşneaga" Endocrinology Department during 2019 year.

MATERIALS AND METHODS

The research realized in the Endocrinology Department of Timofei Moşneaga Republican Clinical Hospital is a retrospective cohort study. In order to achieve the goals of the study, were analyzed the clinical observation sheets of the

patients with T2D hospitalized in the period between 01.01–31.12.2019.

The total number of all patients hospitalized during mentioned period formed a group of 2067 patients, 1388 of which were people with the established diagnosis of T2D, which represented 67% of all hospitalizations in the Endocrinology Department.

The study group included 1148 clinical observation sheets of patients with T2D, who were eligible according to the inclusion criteria: known diagnosis of T2D, the presence of information in the observation sheet regarding anthropometric data, HbA1c values, treatment regimens administered in outpatient conditions and discharge treatment recommendations. Hence the study group constituted 83% from all hospitalized patients diagnosed with T2D.

In the examined group the patients ranged from 40 to 80 years with an average of 57.4 ± 6.07 years, the disease duration was between 0–38 years with an average of 11.1 ± 5 years. The distribution by gender criteria determined that the study group was relatively proportional – there were 628 (54.7%) women and 520 (45.3%) men.

The division of patients according to the duration of diabetes was performed to observe the rate of treatment regimens administered at different stages of diabetes mellitus.

In order to analyze whether the therapeutic objectives were achieved, the value of HbA1c and the treatment regimens applied before admission and discharge were analyzed.

RESULTS

T2D treatment is complex and can be performed either by monotherapy with non-insulin oral antidiabetics or insulin, or in various combinations of medications. In our study we aimed to highlight what were the treatment regimens used by patients until and after hospitalization in the Endocrinology Department.

We tried to highlight the treatment regimens according to the administered drugs: oral antidiabetics (as monotherapy or combination therapy), combination therapy (oral antidiabetics + different insulin therapy regimens) and insulin therapy only.

The general study group was divided according to the duration of diabetes into 7 subgroups for every 5 years, except the early period, which included people with newly diagnosed diabetes with a duration up to 1 year, after which the distribution was made in the following way: 1–5 years; 6–10 years; 11–15 years; 16–20 years; 21–25 years and people with the disease duration over 25 years. The treatment schemes in every subgroup were analyzed to follow the changes in the management of the disease depending on the duration of diabetes, the graphical representation can be observed in Figure 1.

Management of hyperglycemia in T2D is changing over the course of diabetes from simple to compound – from monotherapy to combination therapy, initially with oral diabetes medications after which goes people taking the combination of metformin and insulin, to people treated with various insulin regimens. This is due to the progressive evolution of the disease which over time leads to depletion of β cell function.

Following the analysis (Figure 2) it was determined that until the hospitalization 24 of the patients did not receive drug treatment, which represents 2% of cases in the general study group, oral antidiabetic treatment was administered by 379 patients (33%), combinations of oral hypoglycemic medications and insulin were reported in 435 patients (38%) and insulin therapy was administered by 310 patients (27%).

It is observed a change in the hypoglycemic therapeutic profile at discharge, so that patients without drug treatment disappear completely, the rate of oral agents administration decreases from 33% (379 patients) to 21% (241 patients), the rate of insulin administration as monotherapy decreases from 27% (310 patients) to 15% (173 patients), while the rate of people taking oral diabetic medication + insulin combination therapy has an upward trend to 64% (734 patients) from 38% (435 patients), practically doubling compared to pre-hospital treatment.

The most common administrated oral hypoglycemic agent was metformin, which is present in outpatient treatment regimens in 804 of the cases. Metformin was administered either as monotherapy in 197 patients (24.5%) or combination therapy in 607 patients (75.6%).

Inpatient treatment regimens differ from outpatient treatment schemes due to the need to intensify therapy to reduce glycemic values and reduce the risk of hypoglycemia, with a predominant percentage of combined regimens with oral antidiabetics and insulin.
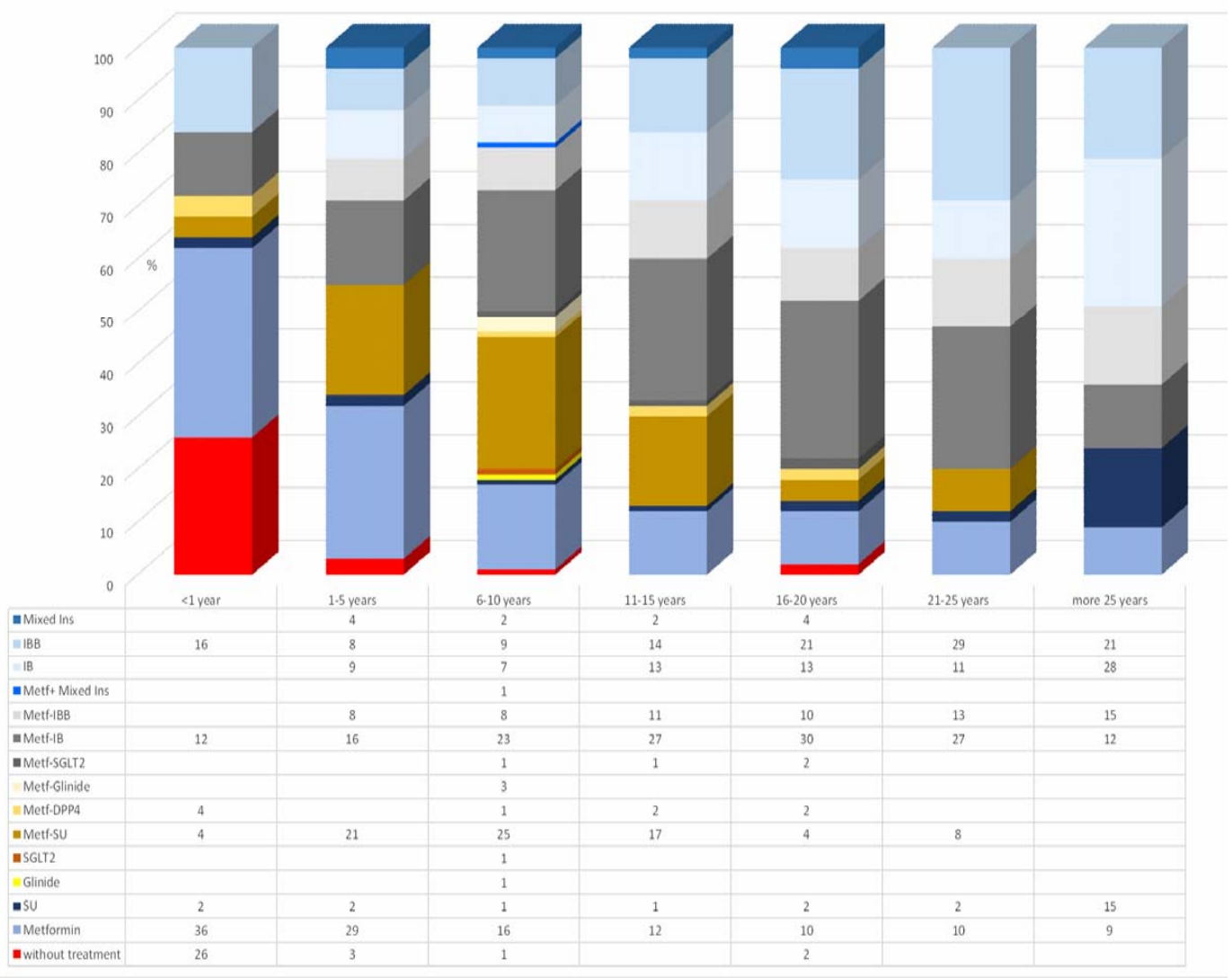
	<1 year	1-5 years	6-10 years	11-15 years	16-20 years	21-25 years	more 25 years
Mixed Ins		4	2	2	4		
IBB	16	8	9	14	21	29	21
IB		9	7	13	13	11	28
Metf+ Mixed Ins			1				
Metf-IBB		8	8	11	10	13	15
Metf-IB	12	16	23	27	30	27	12
Metf-SGLT2			1	1	2		
Metf-Glinide			3				
Metf-DPP4	4		1	2	2		
Metf-SU	4	21	25	17	4	8	
SGLT2			1				
Glinide			1				
SU	2	2	1	1	2	2	15
Metformin	36	29	16	12	10	10	9
without treatment	26	3	1		2		

Figure 1. The analysis of treatment methods in dependence of T2D duration.
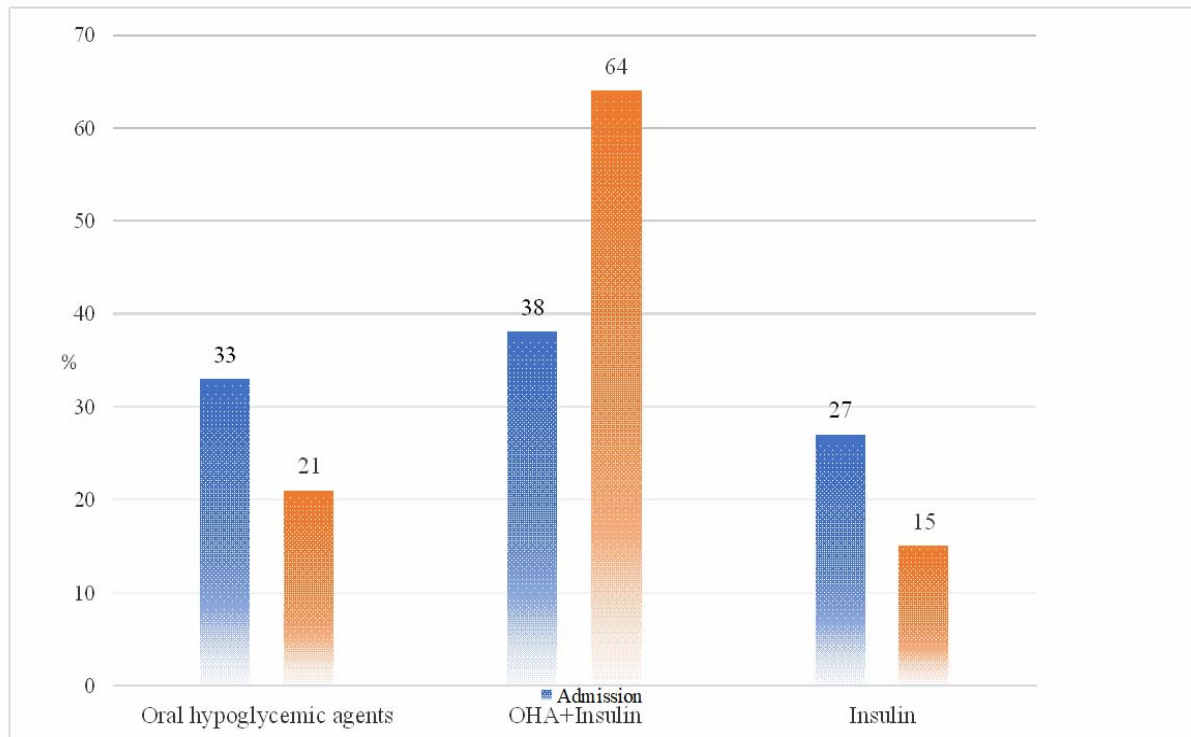
Figure 2. The analysis of treatment schemes at admission and discharge.

CONCLUSIONS

1. The rate of patients hospitalized with T2D during 2019 was 67%. Patients mainly belonged to the age groups between the 5th and 6th decades of life. The gender distribution was practically similar in the age group between 40–69 years, the male predominating in the 20–39 age period.

2. The mean values of carbohydrate metabolism parameters were much higher than the therapeutic targets, so only 28% of the patients had a satisfactory glycemic control.

3. The HbA1c value was higher than 8% in 77% of cases and only 9% of patients reached the target of HbA1c below 7%.

4. The treatment analysis in dependence on the duration of diabetes demonstrates a reduction in oral hypoglycemic agent monotherapy regimens and the increase in the number of patients administrating insulin therapy in different schemes (monotherapy or combination with oral agents) and regimens (basal or basal bolus).

5. Outpatient treatment regimens mainly consisted of combination therapies, in particular metformin plus insulin or metformin in combination with new drug groups (DPP4 and SGLT2) – as a result the intensification aimed at normalizing HbA1c value.

ABBREVIATIONS

T2D – Type 2 Diabetes
HbA1c – Glycated Hemoglobin
DPP4 – Inhibitors of dipeptidyl peptidase 4
SGLT2 – Sodium-glucose cotransporter-2

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