INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 05 Issue 05 May 2022

DOI: 10.47191/ijmra/v5-i5-13, Impact Factor: 6.261

Page No. 971-974

Relationships Between the Achieved Target Levels of LDL Cholesterol and the State of Various Types of LV EF in Patients with Coronary Artery Disease and Type 2 Diabetes.

Mukharram A.Musaeva[1], Dinara A.Parpibaeva[2], Muborak S.Salaeva[3], Nargiza D.Salimova[4]

[1]Assistant of the simulation training department of the Tashkent Medical Academy, Tashkent, Uzbekistan

[2]Doctor of Medical Sciences, Associate Professor, Head of the Department of Simulation training, Tashkent Medical Academy, Tashkent, Uzbekistan

[3]Candidate of medical sciences, Associate Professor of the Department of Simulation training, Tashkent Medical Academy, Tashkent, Uzbekistan

[4]Candidate of medical sciences, Associate Professor of the Department of Simulation training, Tashkent Medical Academy, Tashkent, Uzbekistan

ANNOTATION: Today, diabetes mellitus is one of the most powerful risk factors for the development of cardiovascular diseases and its complications. [1] In 50% of patients with type 1 diabetes and in 80% of people with type 2 diabetes, early disability and premature death are recorded due to cardiovascular complications. People with diabetes are often at risk for strokes, heart attacks, and high blood pressure. In this regard, the main strategy for the treatment of patients with diabetes is to prevent the development of cardiovascular complications, which includes strict control of glycemia, blood pressure, as well as antiplatelet and lipid-lowering therapy.

Despite the fact that strict glycemic control alone does not reduce the risk of myocardial infarction and mortality from it, most epidemiological and pathophysiological studies indicate a worse prognosis and a higher incidence of cardiovascular complications in chronic hyperglycemia. The use of a fixed combination of sitagliptin / metformin is one of the preferred options in the treatment of type 2 diabetes in patients with a high risk of cardiovascular disease due to the presence of type 4 dipeptidyl peptidase inhibitors of cardio protective effects. In this paper, changes in the lipid spectrum in patients with ischemic heart disease and type 2 diabetes mellitus with varying degrees of cardiac output are related to the number of years the patient has had diabetes mellitus, sitagliptin / metformin and statin drugs changes depending on the dose are highlighted.

KEYWORDS: dipeptidyl peptidase-4 inhibitors, metformin, type 2 diabetes mellitus, heart failure, average ejection fraction, preserved ejection fraction, lipid spectrum, statin.

INTRODUCTION

Type 2 diabetes mellitus (DM2) is a chronic progressive disease. Half of the patients with DM 2 already had complications, including those from the cardiovascular system, by the time the disease manifested. Ccardiovascular diseases are 2–5 times more common in people with diabetes than in people without this pathology [1,4]. By the age of 50, almost 50% of diabetic patients have at least one of them unstable angina, myocardial infarction, life-threatening cardiac arrhythmias, and chronic heart failure rapidly develops.[2] At the same time, there is a high risk of developing conditions such as coronary heart disease (CHD), myocardial infarction (MI), arterial hypertension (AH), and acute cerebrovascular accident (ACVA). Thus, 69% of patients with diabetes have dyslipidemia, 80% have hypertension, 50–75% have diastolic dysfunction, 12–22% have chronic heart failure (CHF).[1] Mortality from MI among patients with DM is 1.5–2 times higher than among people who do not suffer from this disease, both in the acute stage of MI and during long-term follow-up [2]. In this regard, the main strategy for the treatment of patients with diabetes is to prevent the development of cardiovascular complications, which includes strict control of glycemia, blood pressure, as well as antiplatelet and lipid-lowering therapy. The development of vascular complications of type 2 diabetes mellitus is associated with chronic hyperglycemia, so the goal of treating the disease is to compensate for carbohydrate metabolism disorders as fully as

possible. The lack of an ideal drug for the treatment of patients with type 2 diabetes, which would not only be able to provide high-quality and permanent control of glycemia without weight gain, the risk of hypoglycemia, and a negative effect on the heart, kidneys and liver, but also preserve the secretory function of β-cells, forced scientists to continue the search for new opportunities to influence the cause of the onset and progression of type 2 diabetes.

The attention of the entire diabetic community is drawn to the cardiovascular safety of hypoglycemic drugs. The combination of metformin + DPP-4 inhibitor is associated with a significantly lower risk of adverse cardiovascular events and all-cause mortality.[3] Numerous randomized clinical trials involving sitagliptin / metformin have a strong evidence base that allows you to comprehensively evaluate the hypoglycemic and non-glycemic effects, as well as the safety of use, especially in the group of patients with heart failure-mean ejection fraction. Anti-atherosclerotic properties of DPP-4 inhibitors may be associated with anti-inflammatory activity, improvement of endothelial function, and effects on lipid metabolism. In particular, while taking DPP-4 inhibitors in patients with type 2 diabetes, there was a decrease in the concentration of markers of systemic sluggish inflammation (low grade inflammation), including C-reactive protein, interleukins 1β, 6 and 18, tumor necrosis factor α, secretory phospholipase A2, macrophage activation marker sCD163.[1,5]

MATERIAL AND RESEARCH METHODS

A total of 60 patients with coronary artery disease and 2 patients with concomitant diabetes aged 30 to 70 years were examined. Patients of the main group (n-50) were divided into 2 groups depending on the ejection fraction (EF).

The first group - with an average ejection fraction (HF aEF -40-49%) - n-17.

The second group - with preserved ejection fraction (HFpEF ≥50%) n- 33.

Work with each patient included: questioning (complaints, anamnesis), physical examination (measurement of height and body weight of the patient with calculation of BMI, as well as examination of the cardiovascular, respiratory, digestive, urinary and endocrine systems). Paraclinical examination included: general analysis of blood and urine, biochemical blood analysis, ECG, echocardiographic examination of the heart, HMECG, daily monitoring of blood pressure, questionnaires using the Moirsky-Green questionnaires to assess adherence.

RESEARCH RESULTS

In the whole sample, the mean experience of DM-2 did not differ between the groups and amounted to 10.05±0.59 and 9.5±0.81 years; according to the number of patients who underwent AMI 7 and 5 ($\chi 2$=0.18); PCI 7 and 7 ($\chi 2$=0); the mean age of patients was 59.3±1.4 and 62.4±2.3 years (P=0.5) in the groups with HF aEF and HF pEF, respectively.

To correct the lipid spectrum, patients were prescribed fixed doses (10-20 mg/day) of rosuvastatin from the moment of admission (many patients were already taking a statin). Statin therapy was prescribed for the entire observation period with compliance control.

Monitoring of the patients' condition (clinical and instrumental data, indicators of lipid and carbohydrate metabolism) was carried out at admission and after 1 year of follow-up.

Analysis of the studied indicators depending on the achievement of target levels of LDL cholesterol showed the following. The number of patients who reached the target level of LDL-C was higher in the HFaEF group and amounted to (n-9; 53%) versus (n-12; 36%) in the HFpEF group. Although some patients were already initially at the achieved target level, and continued to take statins at the same dose.

According to the analysis of lipid spectrum indicators (Table 3.3.1), in patients with HFaEF, the average values of TC were: in the initial state 129±12.17 mg/dL; after a year of observation 110.5±9.92 mg/dl (in relation to the initial state t= 1.177; P=0.09); and in the comparison group with HFpEF: at the beginning of the observation 193.75±9.38 mg/dl; after a year of observation 144.83±1.42 mg/dl (in relation to the initial state t= 5.150; P=0.01). That is, the severity of the decrease in the level of total cholesterol was determined by the level of cholesterol at the beginning of the observation. And the difference in reduction was 18.5±3.69 mg/dL (HFaEF) VS 48.91±7.96 mg/dL (t=-3.46589900; P=0.04).

Comparing the parameters of LDL cholesterol in the analyzed subgroups, we see the following features. In the group of patients with HFmean LDL EF decreased from 54±11.04 mg/dl to 39.75±7.52 mg/dl (t= -1.066; P=0.5) (t= -2.820; P=0 .04), in the HF HF group from 82.75±15.10 mg/dl (t= -1.183; P=0.5) to 64.16±4.28 mg/dl (t= -1.183; P= 0.5). Despite a significant difference in the level of reduction between groups (t=2.820; P<0.05). Although this difference was not significant in terms of Δ reduction in LDL-C and amounted to 18.58±10.81 in the group with HF and 14.25±5.02 mg/dL (t=-0.363; P>0, 5).

A similar situation is repeated with the content of triglycerides. Initially, the initial levels of triglycerides differed in subgroups and in the group with HFpEF was significantly higher than in the group with HFaEFF was 220.83±4.89 mg/dl versus 167.33±19.44 mg/dl

(t=-2.667; P=0.04). A distinctive feature is the degree of severity of the level of TG.Аналогичная ситуация повторяется и с содержанием триглицеридов. A distinctive feature is the degree of severity of the level of TG. In the group of patients with the target level of LDL-C with HF pEF, the decrease in TG was pronounced and amounted to 202.66±0.61 mg/dL (t= - 3.679; P<0.05), compared with the decrease in TG in the subgroup with HFaEF 164.55±18.93 mg/dL (t=-0.102; P=0.5). But according to the degree of decrease in the difference in ΔTG in the group with HF aEF, there was no decrease in TG 2.77±11.42 mg/dL (t=-2.667; P=0.04), in comparison with the group of HF pEF 18.16±5, 51 mg/dL (t=-1.213; P=0.4). Perhaps the results obtained can be explained by a decrease in the level of PPG in this subgroup (HF pEF), because they are interconnected.

The eGFR indices in the subgroups did not change for the worse, and were before and after treatment in the HF aEF and HF pEF groups, respectively: 66.9±8.32 vs 61.8±5.72 and 69±8.57 vs 74±2 .04.

Biochemical parameters depending on the achievement of target levels of LDL-C (70 mg/dl) in patients with coronary artery disease with DM 2 with HF aEF and HF pEF before and after treatment (M±m).

Indicators	CH ср ФВ (n-9)		CH с ФВ (n-12)	
	До лечения	После лечения	До лечения	После лечения
Total cholesterol, mg/dl	141,7±18,7	116±9,58##	193±9,38	144±1,42**
CHLDP, mg/dl	68,4±17,4	43,5±7,64##	82,7±15,1	64,1±4,28
CHHDL,mg/dl	32±2,81	37±3,31	31,9±3,67	35,6±1,02
CHVLDP, mg/dl	32,8±3,54	32±3,75###	77,5±1,02	63±0,61**
TG, mg / dL	167±19,4	164±18,9#	220±4,89	202±0,61**
GFR,ml/min/1.73m ²	66,9±8,32	61,8±5,72	69±8,57	74±2,04
PCI, (number)	7		7	0(χ2)
PICS, (number)	7		5	0,18(χ2)
DM (years)	10,5±0,59		9,5±0,81	
Дозы С/М, мг	61,1/705,5± 7,34/82,6	61,1/705,5± 7,34/82,6	62,5/850± 10,2/30,61	54,1/850± 10,2/30,61
Doses S/M, mg	18,8±2	19,4±0,55	19,7±4,26	17,9±2,04
Fasting blood glucose, mmol/l	8,6±0,42	7,57±0,42*	11,1±0,75	9±0,97
Postprandial blood glucose, mmol/l	13,6±1,26	10,3±0,52	14,8±2,24	11,6±1,95*
HbA1,%	7,64±0,59	7,28±0,22##	9,8±0,64	8,35±0,31*

*P<0.05; ** P<0.01, *** P<0.001 between baseline and stage of therapy in the analyzed groups.

CONCLUSION

The increase in blood sugar and lipid index was an interrelated process, and in both groups a positive change in lipid profile was noted as a result of the pleiotropic effect of the drug metformin. In the 1st group 9 (52.9%) and in the 2nd group 12 (36%) patients reached the target level for CHLDLP. CHVLDP and TG in the HF pEF group decreased significantly after treatment compared with the HF aEF group. Blood sugar levels also dropped significantly. Changes in the parameters of the lipid spectrum in patients with HF pEF do not depend on the state of carbohydrate metabolism compensation. While in the group of patients with HF aEF content is 1.3 times lower, especially at the final stage (t=3.061; P=0.003), the CHLDLP in the outcome is 1.6 and after treatment is 2.1 times lower in terms of compared with the group of heart failure with pEF, especially in decompensated patients with the same doses of statins and sitagliptin / metformin.

The combination of sitagliptin/metformin in the regimen of hypoglycemic therapy in patients with type 2 diabetes is well tolerated by patients and did not cause hypoglycemia.

REFERENCES

1) Diabetes mellitus and cardiovascular diseases // Edited by Ametov A.S., Kurochkin I.O.
2) Ametov A.S., Pakus E.N. Efficacy and safety of the combination of metformin and sitagliptin in the treatment of patients with type 2 diabetes mellitus with obesity // Diabetes Mellitus 2010. No. 3. C. 62–65.

3) Algorithms of specialized medical care for patients with diabetes mellitus / Edited by I.I. Dedova, M.V. Shestakova, A.Yu. Mayorova. – 9th edition (updated). – M.; 2019. P. 214. DOI: 10.14341/DM221S1
4) Rustamova M.T., Salaeva M.S., Salimova N.D., Nurmatov D.Kh. Influence of risk factors for the development of renal dysfunction in patients with stable angina on the background of type II diabetes mellitus // Bulletin of the Association of Physicians of Uzbekistan, Tashkent. 2020. S. 16-19
5) Kubota A, Maeda H, Kanamori A, Matoba K, Jin Y, Minagawa F, et al. Pleiotropic effects of sitagliptin in the treatment of type 2 diabetes mellitus patients. J Clin Med Res 2012; 4:309-13.
6) Sesti G, Avogaro A, Belcastro S, Bonora BM, Croci M, Daniele G, et al. . Ten years of experience with DPP-4 inhibitors for the treatment of type 2 diabetes mellitus. Acta Diabetol. (2019) 56:605–17. 10.1007/s00592-018-1271-3
7) Gallwitz B. Novel therapeutic approaches in diabetes. Endocr Dev. (2016) 31:43–56. 10.1159/000439372
8) Deacon CF, Holst JJ. Dipeptidyl peptidase-4 inhibitors for the treatment of type 2 diabetes: comparison, efficacy and safety. Expert Opin Pharmacother. (2013) 14:2047–58. 10.1517/14656566.2013.824966
9) Gerich JE. Contributions of insulin-resistance and insulin-secretory defects to the pathogenesis of type 2 diabetes mellitus. Mayo Clinic Proc. (2003) 78:447–56. 10.4065/78.4.447
10) Creutzfeldt W. The incretin concept today. Diabetology. (1979) 16:75–85. 10.1007/BF01225454
11) Nauck MA, Meier JJ. Incretin hormones: their role in health and disease. Diabetes Obes Metab. (2018) 20(Suppl 1):5–21. 10.1111/dom.13129
12) Sesti G, Avogaro A, Belcastro S, Bonora BM, Croci M, Daniele G, et al. . Ten years of experience with DPP-4 inhibitors for the treatment of type 2 diabetes mellitus. Acta Diabetol. (2019) 56:605–17. 10.1007/s00592-018-1271-3