

**THE ANALYSIS OF TREATMENT SCHEMES EMPLOYING
EXCLUSIVELY ORAL ANTI-DIABETES DRUGS IN DIABETES
MELLITUS TYPE 2 TREATMENT, IN BIHOR COUNTY,
BETWEEN 2007 AND 2011.**

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Abstract

The patients presenting diabetes mellitus type 2 suffer generally from overweight or obesity, displaying contributing life style (alimentary habits, sedentary) acting together with other factors to induce the onset of the disease. The early initiation of the treatment is associated with an improved control of the blood sugar level and the reduction of the complications of diabetes mellitus. The present study was aimed to monitor the frequency of administration of the oral anti diabetes drugs in monotherapy, in associated oral anti-high blood sugar medication and the preferred type of medication recommended for therapy.

Key words: diabetes mellitus, oral anti-diabetes drugs

INTRODUCTION

The patients presenting diabetes mellitus type 2 suffer generally of overweight or obesity, displaying contributing life style (alimentary habits, sedentary) acting together with other factors to induce the onset of the disease [1]. Therefore, soon after diagnosis it is urgent to identify the intervention means on the life style. By improving the life style the following objectives are aimed: decrease of blood sugar level, normalization of blood serum lipids level, of uric acid level (alternatively, to bring this indicators as close to normal levels as possible), to maintain at an optimal level the blood pressure. When the attempts to improve life style fail, a switch to drug medication is to be performed [2].

The initiation of early drug medication is associated with an improved control of the blood sugar level and the reduction of long term complications in *diabetes mellitus* type 2 [3].

The classes of drugs employed in *diabetes mellitus* treatment are recorded in table 1.

Table 1.

Therapy options in diabetes mellitus type 2

Biguanides
Sulphonyl ureic drugs
Meglitinides derivatives
Inhibitors of alpha-glucosidase
Thiazolidinediones (TZDs)
Glucagon like peptide-1 agonists (GLP-1)
Dipeptidil peptidase IV inhibitors (DPP-4)
Insulin
Amylomimetics
Dopaminergic agonists

In the absence of metabolic balance corresponding to proposed targets, relying exclusively on monotherapy, combined oral therapy is imposed. It can be employed in patients recently diagnosed with type 2 diabetes mellitus, presenting the level of blood sugar à jeun ≥ 240 mg/dl, but < 300 mg/dl (in the absence of urinary cetonic bodies) and/or HbA1c $\geq 9,0\%$ but $< 10,5\%$. The most frequent drug combination is the association of biguanides and sulphonylureic drugs. In this situation, generally hospitalization is necessary: at least at the beginning, insulin treatment is compulsory [4].

MATERIAL AND METHOD

In the present study were included all the patients with type 2 diabetes mellitus recently diagnosed, monitored by the Diabetes, Nutrition and Metabolic Diseases County Center, Bihor County, during 5 years (2007-2011). The data concerning the prescribed treatment were accessed from the individual observation sheet of each patient included in the study.

RESULTS

The therapy with oral anti-diabetes drugs was initiated soon after diagnostication in a proportion of diabetes mellitus type 2 patients of 63.54%-70,55% of the 14,358 new diabetes mellitus type 2 cases registered in Bihor County during the study period.

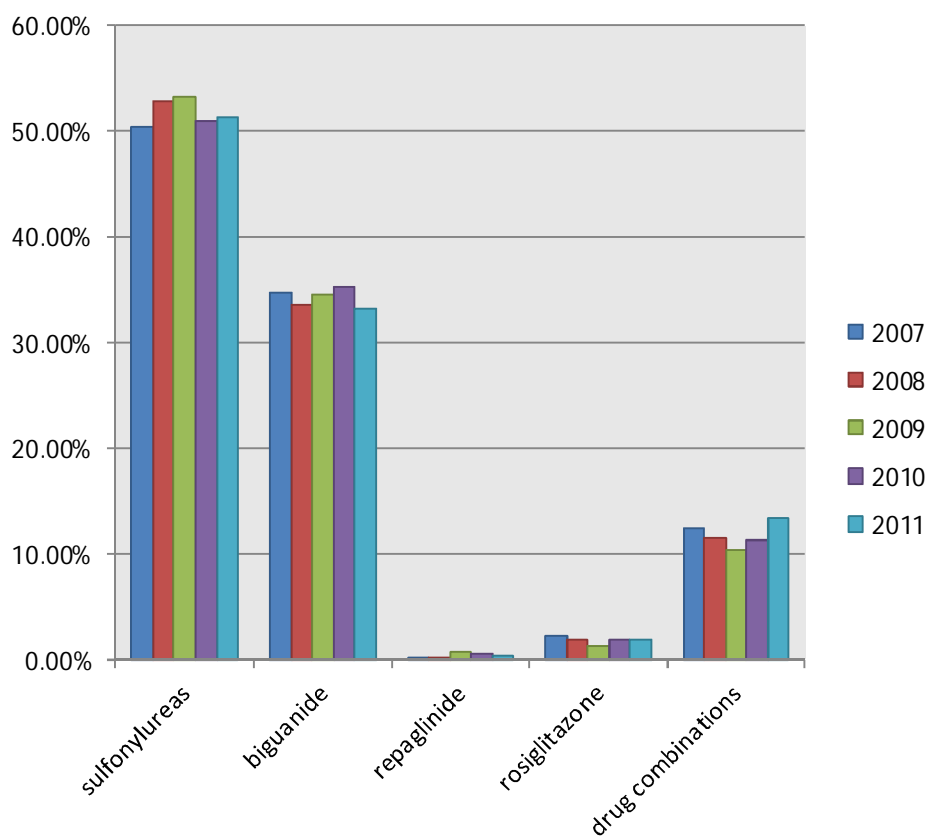
Employed in mono-therapy, an increase in frequency prescription of sulphonylureic drugs followed by biguanides was observed. The acarboze, repaglinide and rosiglitazone employed in mono-therapy were rarely observed in therapeutical schemes prescribed to the patients suffering from type 2 diabetes mellitus.

Drug associations followed in terms of frequency the utilization of sulphonylureic drugs and bigunides in mono-therapy (Tab.2).

Table 2.

The analysis of treatment schemes employing exclusively oral anti-diabetes drugs.

Oral anti-diabetes drugs	2007	2008	2009	2010	2011
<i>Sulphonylureas</i>	50,34%	52,89%	53,24%	51,04%	51,35%
<i>Biguanide</i>	34,80%	33,56%	34,45%	35,34%	33,21%
<i>Repaglinide</i>	0,22%	0,20%	0,67%	0,55%	0,30%
<i>Rosiglitazone</i>	2,30%	1,90%	1,27%	1,84%	1,79%
<i>Drug combinations</i>	12,34%	11,45%	10,37%	11,23%	13,35%



Associations of sulphonylureic drugs with biguanides followed by the association of sulphonylureic drugs with rosiglitazone, the utilization of the later increasing since 2010 (Tab.3).

Table 3.

Utilization frequency of oral anti-diabetes drugs.

Drug associations	2007	2008	2009	2010	2011
<i>sulphonylureas+biguanide</i>	99,72%	90,23%			
<i>sulphonyl ureas+acarbose</i>					
<i>sulphonylureas+rosiglitazone</i>					
<i>biguanides +rosiglitazone</i>		8,12%	10,83%	11,14%	12,34%
<i>biguanides+repaglinide</i>					
<i>biguanides+acarbose</i>					
<i>acarbose+ rosiglitazone</i>					
<i>acarbose+ repaglinide</i>	0,28%	0,45%	0,33%	0,32%	0,48%
<i>repaglinide + rosiglitazone</i>					

Most frequently employed among oral anti-diabetes drugs was sulphonylureic medication during the analyzed period in mono-therapy and in associated drugs therapy.

A decreasing trend was correlated with reduction of sulphonylureic medication in mono-therapy in favor of biguanide associations and less in acarbose and rosiglitazone associations(Tab.4)

Table 4.

The weight of sulphonyl ureic medication utilization

Oral anti-diabetes drugs	2007	2008	2009	2010	2011
<i>sulphonyl ureic drugs</i>	70,34%	69,78%	68,69%	70,14%	67,92%
<i>sulphonyl ureas+ biguanide</i>	23,78%	25,16%	26,32%	21,44%	27,54%
<i>sulphonylureas +other anti-diabetes medication</i>	5,88%	5,06%	4,99%	8,42%	4,54%

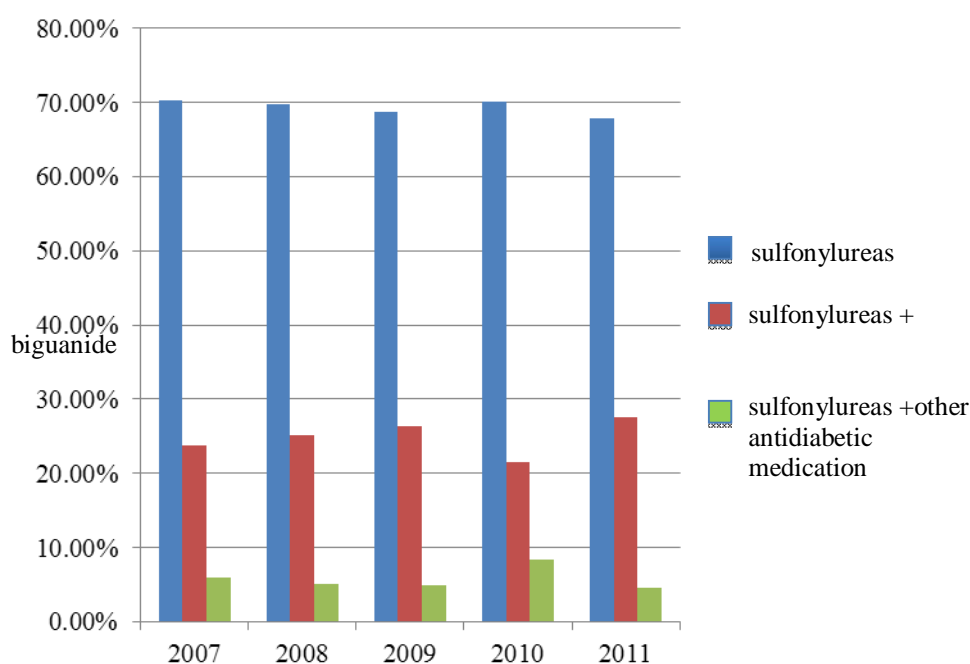


Fig. 2: Sulphonylureic medication utilization weight at the onset of type 2 *diabetes mellitus* treatment

The only biguanide class drug employed in Bihor County during the survey period was metformine. This was employed either in mono-therapy or associated with sulphonylureas and, at lesser extent associated with rosiglitazone or repaglinide (Tab.5).

Table 5.

Weight of biguanides utilization at the onset of type 2 diabetes mellitus treatment.

Oral anti-diabetes drugs	2007	2008	2009	2010	2011
<i>biguanide</i>	52,67%	50,78%	50,39%	48,24%	47,92%
<i>biguanide+sulphonylureas</i>	43,47%	44,32%	46,67%	50,54%	50,58%
<i>biguanide+ other anti-diabetes medication</i>	3,86%	4,90%	2,94%	1,22%	1,50%

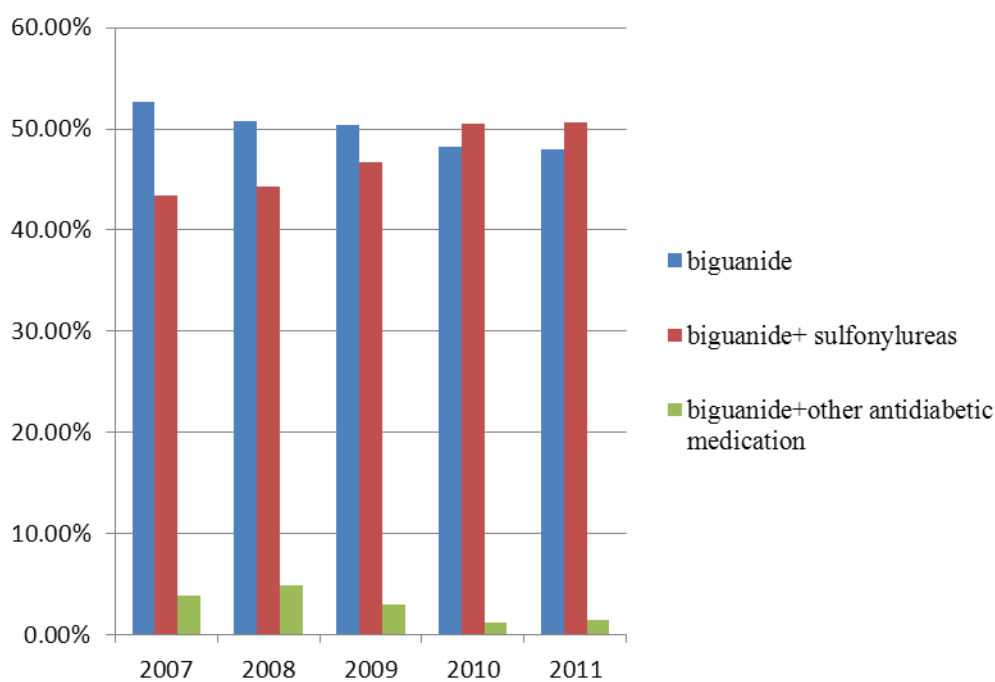


Fig. 3: Biguanides medication utilization weight at the onset of type 2 *diabetes mellitus* treatment

DISCUSSIONS

The decrease of the risk for micro-vascular complications (eye or kidney diseases) is accomplished through the control of blood sugar and pressure. The onset of macro-vascular diseases (coronary, vascular, cerebral-vascular or peripheral) is delayed by an optimal control of blood lipids and high blood pressure, dropping smoking and aspirin therapy. The reduction of neurological and metabolic risks can be obtained by blood sugar control [5-8].

Ideally, the level of blood sugar before meal should be maintained at 90-130 mg/dl and the level of glycosilic hemoglobin (HbA1c) should reach <7%. Aside these measures, the optimization of blood pressure and the control of plasmatic lipids are necessary [9-12].

The drastic drop of blood sugar values cannot be the best strategy for all patients with diabetes mellitus. Hence, it is recommended the stratified approach in assessing individual risk. In patients suffering from type 2 diabetes mellitus with increased cardiovascular risk, the reduction of HbA1c to 6% or even smaller values can increase the risk for cardiovascular failure [3, 13-16].

Sulphonylureic drugs together with biguanidines in mono-therapy were the most frequently prescribed drugs. The acarbose, repaglynid and rosiglitazone used in mono-therapy were also employed in the treatment schemes of type 2 diabetes mellitus.

The association of anti-diabetes medication followed in terms of utilization frequency the use of sulphonylureic and biguanides in mono-therapy. Among the most frequently employed associations were sulphonylureas and biguanides followed by the association of sulphonylureas and rosiglitazone, the utilization of the latter increasing since 2010.

In oral anti-diabetes mono-therapy, the therapy with sulphonylureic drugs represents an important segment of pharmacologic control of the blood sugar level, a worldwide trend. The utilization of sulphonyluric drugs is marked by a decreasing trend, increasing instead the associations containing this category of drugs such as the association with metformine and, at lesser extent, other associations with other anti-diabetes classes of drugs. This trend was observed also in Bihor County being consistent with nationwide trend [17] and with the recommendations included in the guides issued after the survey period [18-21]. This particular trait in therapy approach may be the expression of local traditions or subjective preferences in prescriptions by physicians.

Hence, the slight decreasing trend in the utilization weight of sulphonylureas, however maintaining a prescription level over 50% in oral

anti-diabetes treatment - a fact that puts the surveyed group of patients in a similar situation with the one reported for Spain and Portugal [22, 23]. This can be related to the necessity of conversion of this approach to insulin therapy which registers an increase correlated with the decrease of the analyzed medication.

The analysis confirms the increasing trend concerning therapy option for Metformin which characterizes each surveyed group. The explanations resides in the increase of metformin association to other medication anteriorly prescribed and in a greater extent the increase of metformin frequency utilization as first therapy choice, a phenomenon characterizing mostly the last two years of the surveyed period.

CONCLUSIONS

The objectives of diabetes mellitus management are:

- achievement of high level of specific education, which is compulsory to reach adequate clinical and metabolic parameters.

- adopting adequate treatment according to patient's particular traits, with high flexibility for those integrated in an economic/social system.

- prevention/delay of chronic micro and macro cardiovascular and neurological complications onset.

- ensure a compliance level in the absence of which the life quality of the patient is negatively influenced.

- early detection and correct treatment of associated conditions (affecting cardiovascular system, the liver, the kidneys, etc.).

Among all oral anti-diabetes medication, the most employed during the survey period was sulphonylureic medication, in mono-therapy and in associations of therapy drugs.

On second place, after sulphonylureic medication, most frequently employed were biguanides in mono-therapy and drug combinations.

Among most frequently associated drugs were sulphonylureas with biguanides.

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