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A SHORT OBSERVATIONAL STUDY REGARDING THE LIFESTYLE INTERVENTION IN NEWLY DIAGNOSED TYPE 2 DIABETIC PATIENTS – COHORT 2010

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Abstract

To evaluate the results in metabolic control at newly discovered type 2 diabetic mellitus (T2DM) patients regarding the lifestyle optimization only. In this short (1 year) observational study we included a number of 1855 newly discovered T2DM patients. We compared body mass index (BMI), fasting blood glucose (FBG), HbA1c, triglycerides (TG), high density level cholesterol (HDLc) all these recorded initially at the diagnosis and then 1 year later. At baseline 52.91% males and 52.41% females were recommended only lifestyle and the rest was treated with metformin, sulfonylurea or insulin. After one year the patients who remained on lifestyle only decreased with only 5%, demonstrating that lifestyle optimisation remains one of the most important “therapeutic” tools in the metabolic control of T2DM patients studied.

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Key words: metabolic syndrome, body mass index, HDL.

Introduction

Classically, lifestyle changes (diet and exercise) have been considered a cornerstone of the treatment of both type 1 and 2 diabetic patients. Recently, some guidelines (1) recommend that drug therapy must be initiated as soon as possible after the diagnosis of diabetes. Weight loss strategy in patients with type 2 diabetes mellitus (T2DM) consists in low caloric and low fat diets.

The aim of our study was to assess the safety and efficacy of one year lifestyle intervention as the single first therapeutic step in newly diagnosed T2DM patients.

Patients and methods

This study was conducted in the outpatient Diabetic Center “Ion Pavel” belonging to the National Institute of Diabetes “N.C. Paulescu”, from 1st January – 31st December 2010. During this period 1855 newly diagnosed T2DM patients have been registered. After the exclusion of all primary insulin dependent patients (2) and gestational diabetes patients, there remained: 909 males (49.91%) mean age 56.32(±12.24) years, and 912 females (50.09%) mean age 59.86(±11.2) years.

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T2DM diagnosis and recommendations on diet and physical exercise have been done by the same team, in accordance with the current diabetes care standards in the Center.

Results and Discussion

The main clinical and biochemical characteristics of the studied parameters recorded (for males and females) during the first year after the onset of diabetes are given in Table 1. The body mass index (BMI) was calculated as weight (kg)/height (m²). Fasting venous blood samples were taken to determine fasting blood glucose (FBG), total cholesterol, triglycerides (TG), high density level cholesterol (HDLc) and glycated hemoglobin (HbA1c). Comparison between women and men, in two visits was statistically analyzed using Epi info, with significance threshold set at $p < 0.05$. The biochemical characteristics were presented as mean \pm standard deviation.

It can be seen the dynamics of HbA1c, FBG, TG, HDLc in the first year after the onset of diabetes. Median HbA1c was during the first visit for males 9.03% and during the second visit we observed a significant decrease at 7.6% and for females during the first visit was 8.43% also with a significant decrease at 7.64%. Median fasting glucose (mg/dl) at baseline was 215.65mg/dl for males with a decrease to 176.42mg/dl and for females at baseline was 204.84mg/dl with a decrease to 159.95 mg/dl.

As can be seen, the incidences of diabetes begin to increase from 25-30 years with a sharp slope between 50 and 60 years, with a maximum at 56-60 years. After 60 years, up to 80-90 years the incidence slowly decreases. A small difference in incidence in females can be noted with a lower incidence in males before 60 years, becoming higher after that age. This corresponds with another epidemiologic study published by our group in 1994 (3).

Lifestyle optimization only as therapy at baseline was recommended in 52.41% of females and 52.91% of males. Oral agents were prescribed from the beginning due to higher values of HbA1c or to associated chronic complications or comorbidities to 231 males and 240 females. Only 26.31% of the females were taking metformin while 11.51% were taking sulfonylurea, and only 26.07% of the males were taking metformin while 11.55% were taking sulfonylurea. A short period of insulin treatment was recommended at baseline for 8.80% of the males and 9.75% of the females. The majority of these patients needed a rapid and good metabolic control before surgical intervention for various reasons.

After one year 38.83% of the males and 41.33% of the females remained only on lifestyle optimization and some others were transferred on oral agents - metformin for 35.64% of the males and 34.21% of the females; sulfonylurea for 15.51% of the males and 13.15% of the females. Only 10.01% of the males and 11.29% of the females were using insulin (Fig.3). This observation supports our view that the lifestyle optimization is one of the most important and powerful "treatment" in T2DM patients.

Triglyceride:HDL cholesterol ratio (4) is one of the most useful indicators of proatherogenic profile. The ratio is significantly higher in men than in women, explaining the lower frequencies of cardiovascular complications noticed for women. However, both in males and females this ratio increases with BMI, suggesting that the lipids found in the circulatory are connected with the metabolic function of adipocytes and also with the liver function which is often affected because higher amounts of fat in non-alcoholic fatty liver disease (5,6).

Conclusion

We recorded a significant decrease ($p < 0.01$) in FBG, HbA1c, tri-

Table 1. The clinical and biochemical characteristics for type 2 diabetic patients at baseline and one year later.

	Male		Female	
	First visit	Second visit	First visit	Second visit
BMI (kg/m ²)	29.73 \pm 5.43	29.03 \pm 4.86 [#]	31.74 \pm 6.67	31.18 \pm 6.17 [#]
FBG(mg/dl)	215.65 \pm 98.65	171.42 \pm 64.08*	204.84 \pm 99.32	159.95 \pm 51.9**
HbA1c (%)	9.03 \pm 3.71	7.6 \pm 1.88*	8.43 \pm 2.65	7.64 \pm 1.52*
Triglycerides	245.29 \pm 268.82	176.68 \pm 140.26***	195.7 \pm 179.34	153.66 \pm 96.7***
HDL-c (mg/dl)	40.14 \pm 11.5	41.36 \pm 10.25*	45.25 \pm 12.93	47.04 \pm 12.65*
* $p < 0.001$;	** $p < 0.004$;	*** $p < 0.017$;	[#] NS	

Distribution of T2DM patients by age group

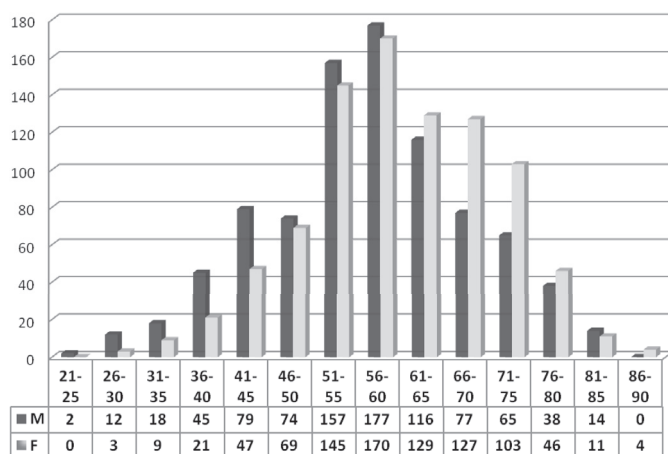


Figure 1. Age distribution of newly diagnosed type 2 diabetic patients.

Baseline

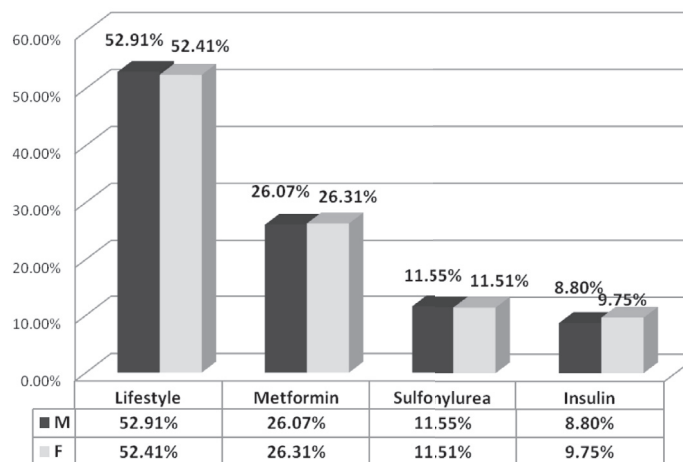


Figure 2. The distribution of patients according to treatment recommendations at first visit.

One year later

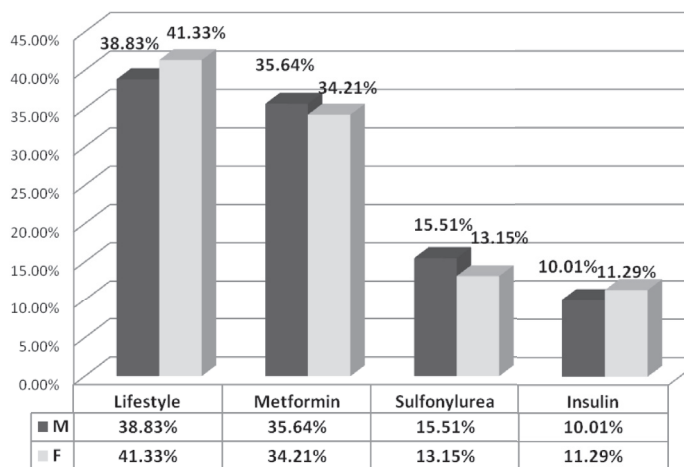


Figure 3: The distribution of patients according to treatment after one year follow up.

The ratio TG/HDLc

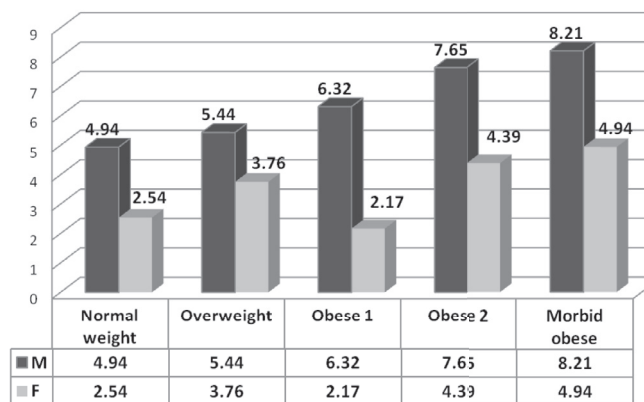


Figure 4. Triglycerides - HDL cholesterol ratio according to body mass index

glycerides, and increase in HDLc and no changes in BMI. Our data strongly support the “classical” view of lifestyle intervention as the first therapeutic step in T2DM. The introduction *per primam* of drug medication might diminish the interest and motivation of patients for the outstanding importance of lifestyle changes. The ratio TG/HDLc can therefore be a useful indicator of proatherogenic profile. We recommend the imple-

mentation of lifestyle optimization even before drug administration for three reasons: (i) as we demonstrated, half of patients remain on medication one year after diagnosis, (ii) the idea must be ingrained in the patient’s mind that lifestyle optimization is an efficient form of treatment that must be respected for his/her entire life, and (iii) lifestyle optimization is much more cost efficient (also see 7,8).

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