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BIOLOGICAL BIOMARKERS OF SIDE COMPLICATION UPON DIABETICS CARRIED IN M'SILA CITY HOSPITAL - ALGERIA.

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ABSTRACT

Diabetes mellitus is a common endocrine disorder chronic metabolic affecting the metabolism of carbohydrates, lipids, proteins and enzyme activities. Diabetes mellitus is a disease not without complications, including acute metabolic complications and chronic complications that are the basis of a very high mortality rate. The objective of this study is to estimate the (Glycemic Equilibrium, HbA1c) for 12 months, and test of pancreatic, kidney function (Amylase, Lipase, Urea, Creatinine). This study was carried out in a hospital, we have followed 59 patients (21 men and 38 women) divided into 2 groups: 40 had chronic complications and 19 had acute omplications.

KEYWORDS: Type I diabetes, Type II diabetes, Glycemic equilibrium, Acute complications, Chronic complications.

INTRODUCTION

In 1946, in the preamble to the constitution of the World Health Organization (WHO) a definition of health is established: "Health is a state of complete physical, mental and social, and not merely the absence of disease or infirmity.» With this definition, prevention and care are not the only means at the health service, there are also the laws, the regulations, the political orientations of environment, and land development .The population health became

a collective responsibility.[1,-2, 3] The term diabetes mellitus etymologically derived from two Greek roots "diabetes" (pass through) and "mellitus" (honey).[4]

Diabetes mellitus is a common chronic metabolic endocrine disorder affecting the metabolism of carbohydrates, lipids, proteins and enzymes.[5] Diabetes mellitus is a disease not without complications, acute metabolic complications and chronic complications that are the basis of a very high mortality rate.[6] The different types of diabetes are manifested clinically by hyperglycemia all, but will differ in their acute and chronic manifestations, by severity and age of onset. They have recently been classified into four groups, two of which are the principal type I diabetes and type II.[7]

Diabetes mellitus (type I and II) is a disease of great frequency and progresses rapidly, it is a major public health problem.[8] If formerly, diabetes mellitus contributes to morbidity and mortality observed in developed countries today developing countries are not spared.[9]

The objective of this study is to estimate the prevalence of diabetes and the test of pancreatic and renal function and evaluation of the liver function, and the search for the presence or absence of metabolic complications associated with diabetes mellitus . The techniques we have applied are those of the interview, clinical examination, biological balance sheets.

MATERIALS AND METHODS

From January 2, 2013 until December 31, 2013 we realized an investigation into the endocrinology unit proximity of M'sila town. Our sample includes 59 patients (21 males and female 38sujets) divided into two groups: 40 with chronic complications and 19 with acute complications. The evaluation of glycemic control (HbA1c and Gly) was performed in all diabetics who viewed in a complete way, systematically and homogeneous for 1 month and then every 3 months, 6 and 12 months.The study was conducted with a endocrinologist, he has established an exhaustive list of the patients with diabetes monitored from January 2013 and has left me free access to the reference sheets. We also systematically searched the existence of cardiovascular risk factors such as smoking and dyslipidemia.

This study allowed an assessment the diagnostic level of diabetes and the therapeutic care of patients and their biological control. So we have two types of evaluation, one is clinical and the other biological.

CLINICAL ASSESSMENT INCLUDED

- Regular weighing of patients to appreciate a possible weight gain.
- Taking blood pressure, looking for one or more metabolic or degenerative complications. (CI, DN, DR, CVA)

Heart failure(HF), Diabetic nephropathy(DN), Diabetic retinopathy(DR), Cerebrovascular accident(CVA).

BIOLOGICAL EVALUATION

THE EVALUATION OF GLUCIDIC METABOLISM: Fasting glucose(FG), glycated hemoglobin(HbA1c). These quantitative data was entered in Microsoft Office Word 2007 software and analyzed on software Graph Pad PRISM (Version 5.0).then they were recovered on Microsoft Office Excel 2007 pages through consultation form (Appendix 4) filled by doctor dealing during the consultation but also through the results communicated either by the patients themselves or by nursing assistant surgeon.

The comparison between groups was performed by the Student t test. The value found by calculating t can affirm that people are different with a risk of error p such that:

-p> = 0.05 the difference was not significant;

-0.05> P> 0, 01 = the difference is significant;

-0.05> P> 0.001 = the difference is highly significant;

- P <0.001 = the difference is highly significant.

RESULTS

1- Evaluation of Glycemic Balance:

1-1-Blood glucose

Table 1: The average rate of blood glucose in the 3 groups after 1.3, 6 and 12 months

	1st month	3rd month	6th month	12th month
Control	0,87 ±0,02	0,87±0,01	0,85±0,01	0,84 ±0,01
Type I diabetics	1,29 ±0,05	1,28 ±0,06***	1,25±0,05***	1,23 ±0,04***
Type II diabetics	1,29 ±0,03	1,28±0,04***	1,24±0,04***	1,22±0,03***

Each value corresponds to the mean ± Standard Deviation (Student test: nsp□0,05, *** p <0.001) groups compared with the control (without diabetes), blood glucose expressed as (g / l).

At first the average of blood glucose of diabetic patients (Type I and II) is satisfactory, from the 3rd month, it shows a very highly statistically significant decrease. Although, the average of blood glucose in non-diabetic patients are normal at 1st month, it's been a decrease of these from the 3rd month until 12th month. Blood glucose in diabetic patients, are higher than those of non-diabetic patients at different time.

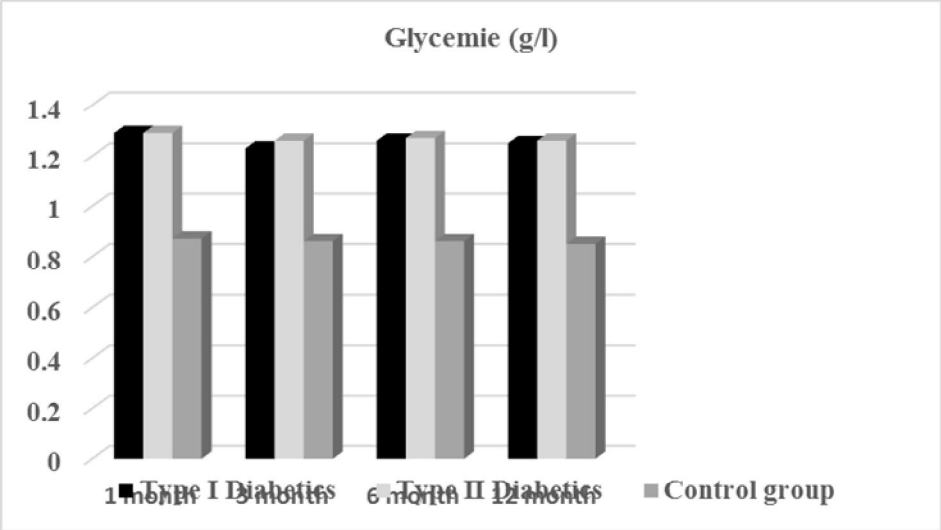

Figure 1: Average rates of glucose levels in the three groups

1-2-HbA1c

Table 2: The mean HbA1c in diabetic patients after 1, 3, 6 and 12 months

	1st month	3rd month	6th month	12th month
Type I diabetics	6,96±0,1%	6,76 ±0,16%	6,73 ±0,16%	6,71 ±0,14%
Type II diabetics	7,22 ±0,1%	6,94 ±0,21%	6,89 ±0,18%	6,84 ±0,18%

Each value corresponds to the mean ± Standard Deviation (Student test: ns p□0,05 ** 0.05> p> 0.001).

The comparison of HbA1c in both groups of patients (Type I) and (Type II) is highly statistically significant difference from the 3rd month until the end of the study (12th month). Patients with diabetes (Type I & II) showing a progressive decrease in their average HbA1c.

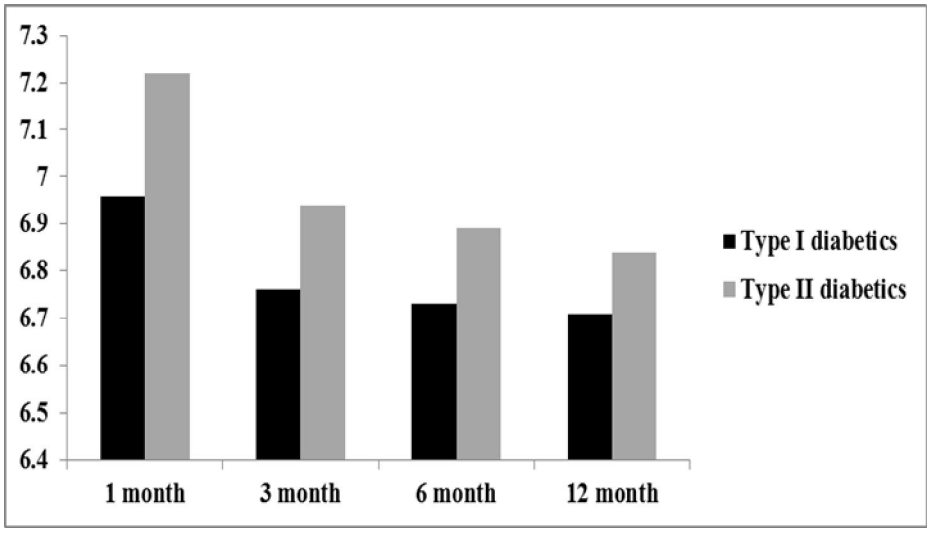

Figure 2: The average level of HbA1c of diabetic patients at 1, 3, 6 and 12 months

2- The evaluation of renal function and testing the function of the pancreas

2-1- The determination of Urea and Creatinine

Table 3: Urea and creatinine in the different complicated diabetic groups

Type de complication	Urea (g/l)	Creatinine (mg/l)
Control	0,17±0,129	09,34±1,29
MCI (Myocardial infarction)	0,235±0,092*	09,75±2,45**
TRI (Terminal Renal Insufficiency	0,945±0,188***	32,75±10,90***
DN(Diabetic nephropathy)	0,220±0,133**	08,84±2,99**
Steatosis	0,306±0,098*	11,22±1,64*
Pancreatitis	0,375±0,063*	13,00±1,41*

Each value corresponds to the mean ± Standard Deviation (Student test: * 0.05> p> 0.01,** 0.05> p> 0.001, *** p <0.001) groups compared with the control (non-diabetic).

All the types of complications having a concentration of urea and creatinine are located in the normal range except patients with TRI (Terminal Renal Insufficiency) showing a higher concentration, which could reach respectively 0.94 g / l 32.75 mg / l on average.

We have found that there is a very highly significant difference of urea and creatinine in patients with Terminal Renal (TRI, Insufficiency and we found a highly significant difference in these parameters for the diabetic nephropathy (DN) group .The groups that have remained showed only significant difference from Control group.

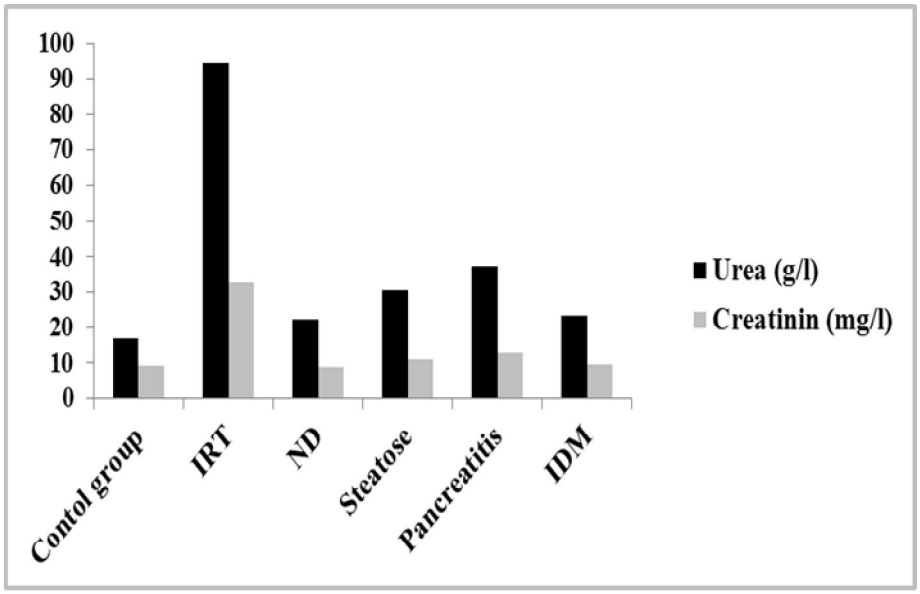

Figure 3: Distribution of urea and creatinine in the complicated diabetics.

2-2- DETERMINATION OF THE LIPASE AND AMYLASE

Table 4: Amylase and lipase in the different complicated diabetic groups

	Amylase (U/L)	Lipase (U/L)
Control	48,95±18,19	30,32±5,43
MCI	60,67±16,33	31,33±5,82
TRI	60,00±23,71	30,00±6,05
DN	54,77±18,66	30,31±5,46
Steatosis	49,00±18,30	30,67±4,35
Pancreatitis	100,00±14,14**	118,50±6,3***

Eeach value corresponds to the mean ± Standard Deviation (Student test: nsp□0,05,** 0.05> p> 0.001, *** p <0.001) groups compared with the control (non-diabetic).

All the types of complications having a concentration of lipase and amylase are located in the normal range except patients who suffer of pancreatitis had a higher concentration of lipase and amylase especially.

We have found a very highly significant increase statistically highly significant lipase and amylase in diabetic patients with pancreatitis.

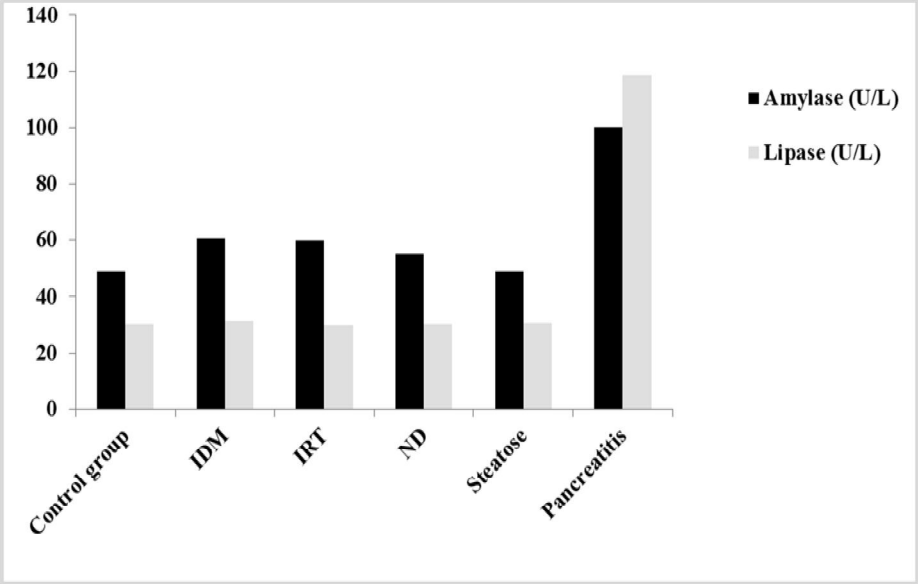

Figure 4: Distribution of amylase and lipase in the complicated diabetic patients

DISCUSSION

So according to these HbA1c values obtained in different times it can be concluded that diabetes in these patients is well controlled, that is to say, their blood sugar is well controlled. Our results are slightly similar to those of.[11, 13, 15, 18, 19] Blood glucose levels of diabetic patients remained satisfactory at different times with a very highly significant decline. Blood glucose in diabetic patients, are higher than those of non-diabetic subjects, at different this time. Our results have been well proven in several studies.[10, 12, 19, 22]

The HbA1c is a more relevant factor for monitoring glycemic control in diabetic patients, the fasting blood glucose is just a snapshot. The UKPDS data have established that a 1% increase in HbA1c is accompanied by over 10 years of a 10% increase in cardiovascular mortalitythis shows the importance of the improvement of the HbA1c. Glycemic control in diabetic patients, were average at the beginning, we found a highly significant improvement in HbA1c from the 3rd month followed until the end of monitoring. In the light of these data, it is possible to deduce that the urea and creatinine are veritable biomarkers for the detection of TRI, because the only complication that had a variation of these two parameters, this increase of urea and creatinine in diabetics who are suffering from IRT has been well demonstrated by.[16, 23, 24, 25, 26]

From our results we can conclude that the lipase and amylase were the only biomarkers for diagnosing a case of pancreatitis in diabetic patients, but the lipase is the most specific and

for this reason it is commonly asked by doctor's internists for the screening of pancreatitis. These observations have been well proved in several studies.[14, 17, 20, 21, 24, 26]

CONCLUSION

Diabetes mellitus in humans, is a disease whose incidence risk of increasing significantly in the coming years, particularly in obese individuals. It is urgent to proceed with a numerical assessment of diabetic pandemic. In medical practice, this assessment is based on risk identification. This is determined not only by biological markers but by a series of clinical parameters have long been known, especially the interrogation in search of family history, clinical examination, and paraclinical examinations; there is currently a very important development of radiological, ultrasound or IRM allow the assessment arterial status well before the appearance of complications.

In all patients with diabetes, the search for a smoking, blood pressure taking and waist measurement are indispensable but often forgotten elements. Every year, it seems necessary to measure the micro albuminuria, total cholesterol, HDL cholesterol and the triglycerides, transaminases and urea and creatinine to detect any complication associated with diabetes.
The demonstration continues for new biochemical and genetic markers is useful for the doctor who, in front of diabetes, has to determine the risk of Acute or chronic complication, to better understand the pathophysiology of diabetic disease and find the therapy more appropriate.

Diabetes, by its prevalence in Algeria and the projections made, should be one of public health priorities for our country. Primary prevention, early diagnosis through screening in subjects at risk and improving care conditions are essential.

Such perspectives merit the further reflection, better coordination of efforts, and thus an effective partnership between governments, health authorities, learned societies, parallel organs - such as Social Security (CNAS) - not forgetting the role of civil society through associations of diabetics.

Under the pressure of globalization, lifestyles are changing throughout the world, which adds to the demographic transition to produce a dramatic increase in the incidence of the disease. The term epidemic is not usurped in many ethnic and geographic communities where the disease is spreading at an amazing speed, as in the Pacific islands or in some Amerindian

communities. The social, financial and human of this "epidemic" will depend on the adaptation of resources and the organization of health systems to prevent complications of the disease and cope.

We have already seen the causes of the epidemic. The means (theoretical) prevention can not just targeting individuals, to encourage them to "lose weight", "eat better" or "move", although these initiatives remain essential. The major challenge of prevention is at the collective level: all major stakeholders in our public life, médecins, epidemiologists, administrators, politicians, industry groups, health workers, states, international donors, must be put in a situation full support of the disease, they must also become aware of the magnitude of the problem and finally act when faced with this scourge has become a serious public health issue.

This study will be really useful when it is followed by others, so compared to subsequent data to assess progress through the quest for quality. This would include more the patients to increase the sensitivity of the results and evaluate the impact of time on these. It is therefore essential to involve the practice of evaluation in a dynamic of change.

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