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SOME BIOCHEMICAL PARAMETERS VALUES ON DIABETES MELLITUS INDIVIDUALS

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Key words: diabetes mellitus

Abstract: From our study resulted that sugar diabetes is more frequent with female subjects and sugar diabetes type II is much more frequent (30 subjects) than type I. Blood urea and creatinine levels of the studied subjects were within normal limits.

INTRODUCTION

Diabetes mellitus is a familial disorder and the susceptibility to it is conditioned-at least in part by inherited factors. Diabetes may thus quite properly be termed inborn. The disease is a complex, widespread disorder of metabolism, intimately related in its scientific history to the development of understanding of the metabolism of carbohydrate, protein and fat. It is clearly influenced by multiple and complex environmental and genetic factors, which interact.

Dobson, in 1776, has concluded that the saccharine matter eliminated by the kidney in diabetes was "not formed by the secretory organ, but previously existed in the serum of the blood". In spite of this fact Ambrosiani is credited with having first recorded in 1835 that the blood of diabetic patients contains more sugar than that of nondiabetic individuals.

THE PURPOSE OF INVESTIGATIONS

With these present investigations we proposed to establish some biochemical parameters values on diabetes mellitus individuals from the population of Neamţ County.

MATERIAL AND METHODS

We choose for our studies 55 subjects with diabetes mellitus, from whom 25 with first typ of diabetes mellitus and 30 with second type of diabetes mellitus. These are from two groups of age: 20-45 years old and 45-70 years old.

In order to establish the diagnosis or to confirm it, blood and urine samples were taken for laboratory tests.

We used the following investigations methods: Oral Glucose Tolerance Test, the glucose dosage in blood and urine useing ortho-toluidine, the determination of glucose (Benedict reaction), the urea dosage in serum using the colorimetric method, the creatinin dosage in serum.

RESULTS AND DISCUSSIONS

Sugar diabetes is a serious disease, whose evolution is characterized by insulin

secretion failure, which leads to major changes in the glucose metabolism. In stead of being used as a nutrient by cells, glucose remains in the blood and can be eliminated through urine.

The diagnosis of diabetes mellitus is performed determining the glucose level in the blood (glycemia). Normal blood sugar values are within 80-110 mg/dl. A person is a suspect of sugar diabetes if the level of blood sugar is higher than 126 mg/dl on an empty stomach. Blood sugar is repeated on different days in order to confirm the diagnosis and other tests are run.

If we analyze the distribution of people according to their type of diabetes, 25 subjects are insulin-dependent and 30 are insulin-independent. Our analysis revealed increases of blood sugar levels in patients suffering from sugar diabetes. Thus, with female patients with sugar diabetes type I, glucose levels are within 266.777-273.8 mg/dl (table 1) and with male patients with sugar diabetes type I, glucose levels are within 250.333-289.6 mg/dl (table 2).

In the case of patients suffering from sugar diabetes type II, glucose levels are the following: with female patients within 156.5-325.916 mg/dl (table 3) and with male patients within 172.5-248.75 mg/dl (table 4). Consequently, there can be noticed a high hyperglycemia.

Blood urea of subjects with sugar diabetes type I varies within 25.68-27.284 mg% with women (table 5) and within 19.76-26.866 mg% with men (table 6). With female patients suffering from sugar diabetes type II, urea levels vary within 25.35-26.725 mg% (table 7); with male patients suffering from sugar diabetes type II blood urea varies within 27.45-30.8 mg% (table 8). We think these are within the normal urea levels, namely 20-40 mg%.

Blood creatinine ranges between 0.95-0.958 mg% with female patients suffering from sugar diabetes type I (table 9) and between 0.98-1.045 mg% with male patients suffering from the same type of diabetes (table 10). Subjects suffering from sugar diabetes II have the following levels of blood creatinine: 1-1.062 mg% with women (table 11) and 0.837-0.925 mg% with men (table 12). The levels of creatinine and urea are within normal limits (0.7-1.1 mg%).

Urine normally has very low levels of carbohydrates (100-300 mg‰ glucose). Pathologically speaking, glucose may appear in significant quantities, phenomenon named glucosuria.

` In our study, patients suffering of sugar diabetes had the following levels of glucosuria: 411.111-426 mg‰ for female patients with sugar diabetes type I (table 13), 376.333-428 mg‰ for male patients with sugar diabetes type I (table 14). 276.666-280.416 mg‰ for female patients with sugar diabetes type II (table 15) and 260-578.75 mg‰ for male patients with sugar diabetes type II (table 16).

From our group study resulted high blood sugar levels which exceed the upper normal limit with 2 or even 3 times. Higher levels of blood sugar were noticed with patients suffering from sugar diabetes type II of 45-70 years old than those of 20-45 years old.

Uremia levels are within normal limits both with subjects suffering from sugar diabetes type I and type II (fig. 5-8).

With the subjects we studied, blood creatinine levels were within normal limits (0.7-1.1 mg%).

Lack of proper treatment of people suffering from diabetes may lead, in time, to complications: cardiovascular (high blood pressure, ischemic heart disease, leg arteriopathy, gangrene), eye (cataract, blindness), kidney (kidney infections, diabetes glomerulonephritis, kidney failure), neurological (brain vascular disease, diabetes polyneuropathy), infectious (lung, urinary, tegument and mucous).

CONCLUSIONS

Diabetes mellitus is a metabolic genetically determined disease, characterized by hyperglycemia and glucosuria, as a result of a carbohydrate metabolism disorder.

The basic cause in most cases is an insufficient quantity of active insulin.

From our group study resulted that sugar diabetes is more frequent with female subjects (of the 55 subjects, 32 were female patients).

Most of the patients with sugar diabetes are 45-70 years old (30 subjects).

Sugar diabetes type II is much more frequent (30 subjects) than type I.

Blood urea and creatinine levels of the studied subjects were within normal limits.

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Table 1
Glucose concentration in female patients blood with diabetes mellitus type I

Biochemical parameter	Normal (mg/dl)	Statistical values			
		Pathological (mg/dl)			
		20 - 45 years old		45 – 70 years old	
		x ±Es	CV%	x ±Es	CV%
Glucose	80-110	266,777 ± 94,749	35,516	273,8 ± 77,166	28,183

Table 2
Glucose concentration in male patients blood with diabetes mellitus type I

Biochemical parameter	Normal (mg/dl)	Statistical values			
		Pathological (mg/dl)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	80-110	250,333 ± 102,267	40,852	289,6 ± 64,871	22,400

Table 3
Glucose concentration in female patients blood with diabetes mellitus type II

Biochemical parameter	Normal (mg/dl)	Statistical values			
		Pathological (mg/dl)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	80-110	156,5 ± 55,417	35,523	325,916 ± 74,228	22,775

Table 4

Glucose concentration in male patients blood with diabetes mellitus type II

Biochemical parameter	Normal (mg/dl)	Statistical values			
		Pathological (mg/dl)			
		20 – 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	80-110	172,5 ± 35,939	20,834	248,75 ± 78,273	31,466

Table 5

Urea concentration in female patients blood with diabetes mellitus type I

Biochemical parameter	Normal (mg%)	Statistical values			
		Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Urea	20-40	27,284 ± 11,801	43,254	25,68 ± 2,288	12,803

Table 6

Urea concentration in male patients blood with diabetes mellitus type I

Biochemical parameter	Normal (mg%)	Statistical values			
		Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Urea	20-40	26,866 ± 12,513	46,575	19,76 ± 4,329	21,907

Table 7

Urea concentration in female patients blood with diabetes mellitus type II

Biochemical parameter	Normal (mg%)	Statistical values			
		Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Urea	20-40	25,35 ± 10,365	40,887	26,725 ± 9,988	37,373

Table 8
Urea concentration in male patients blood with diabetes mellitus type II

Biochemical parameter	Statistical values				
	Normal (mg%)	Pathological (mg%)			
		20 – 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Urea	20-40	30,8 ± 10,103	32,801	27,45 ± 10,342	37,675

Table 9
Creatinine concentration in female patients blood with diabetes mellitus type I

Biochemical parameter	Statistical values				
	Normal (mg%)	Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Creatinine	0,7-1,1	0,958 ± 0,190	19,832	0,95 ± 0,206	21,684

Table 10
Creatinine concentration in male patients blood with diabetes mellitus type I

Biochemical parameter	Statistical values				
	Normal (mg%)	Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Creatinine	0,7-1,1	1,045 ± 0,225	21,531	0,98 ± 0,175	17,857

Table 11
Creatinine concentration in female patients blood with diabetes mellitus type II

Biochemical parameter	Statistical values				
	Normal (mg%)	Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Creatinine	0,7-1,1	1 ± 0,357	35,7	1,062 ± 0,214	20,141

Table 12
Creatinine concentration in male patients blood with diabetes mellitus type II

Biochemical parameter	Statistical values				
	Normal (mg%)	Pathological (mg%)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Creatinine	0,7-1,1	0,925 ± 0,170	18,378	0,837 ± 0,178	21,253

Table 13
Glucose concentration in female patients urine with diabetes mellitus type I

Biochemical parameter	Statistical values				
	Normal (mg‰)	Pathological (mg‰)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	100-300	411,111 ± 66,038	16,063	426 ± 69,137	16,229

Table 14
Glucose concentration in male patients urine with diabetes mellitus type I

Biochemical parameter	Statistical values				
	Normal (mg‰)	Pathological (mg‰)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	100-300	376,333 ± 78,591	20,883	428 ± 62,209	14,534

Table 15
Glucose concentration in female patients urine with diabetes mellitus type II

Biochemical parameter	Normal (mg‰)	Statistical values			
		Pathological (mg‰)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	100-300	276,666 ± 47,609	17,208	280,416 ± 42,664	15,214

Table 16
Glucose concentration in male patients urine with diabetes mellitus type II

Biochemical parameter	Normal (mg‰)	Statistical values			
		Pathological (mg‰)			
		20 - 45 years old		45 – 70 years old	
		x ± Es	CV%	x ±Es	CV%
Glucose	100-300	260 ± 43,204	16,616	578,75 ± 46,598	8,051