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STUDY ON THE ROLE OF KINETIC THERAPY IN THE TREATMENT AND PROFILAXIS OF DIABETES

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Abstract

Research goals:

- to establish which are the optimum exercises to be used in the kinetic programme used in compliance with the patients state (gradation, etiopathogenic context, levels of blood sugar);
- to establish the dos and don'ts in applying the kinetic programme as part of the patient's overall treatment (medication, physical, kinetic) of the patient;
- to establish the optimum number of sessions in a treatment programme;
- to establish the optimum period of using this therapy after which the patient's symptoms will improve;
- to elaborate a kinetic program which the patient could follow and do in their day-to-day life at home or at the workplace.

Methods

Reading the literature

Interviews

Observation

Tests

Trials

Results

Our research has been carried out with the help of 10 volunteers, aged between 32 and 58, with an average age of 45. By studying these cases we have come to know their condition and to understand the way in which the proposed kinetic exercises could be performed. In order to evaluate a patient with diabetes we had to get a full history from the patients, a physical exam and a set of laboratory analyses.

We evaluated:

- The sensation of fatigue felt by the patients
- Dizziness suffered by diabetics
- Insulin level

The state of the patients' health was evaluated by analysing the results obtained concerning the level of fatigue, dizziness, blood sugar level and weight.

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We agreed that physical exercise should be part of the daily routine of the patient and the secure interval of blood sugar for physical exercise is between 100 and 250 mg/dL.

Conclusions

Early use of kinetic therapy through the regular practice of physical exercise is a good prophylactic method for diabetics and it could also lower the risk of developing the disease.

Using kinetic exercises by overweight people keeps their blood sugar in check and they can lose weight. The loss of weight together with the physical exercise prevents the onset of type 2 diabetes in overweight people and quite often helps regulate blood sugar without any medication.

In conclusion, healthy people as well as diabetics can benefit from regular physical activity in order to maintain their weight within reasonable limits, help the body adequately assimilate sugar in the blood which will be efficiently used in the cells and tissues.

Key terms: diabetes, kinetic programme, insulin, physical exercise.

Introduction

Diabetes is a consequence of partial or total absence of secreted insulin which leads to an increase in blood sugar, which causes metabolic unbalances of blood fat, proteins and electrolytes and which in time develops severe micro and macroangiopathic complications. (Dumitrescu, 2003)

Diabetes included a set of metabolic diseases characterised by hyperglycemia (increase in blood sugar) which results in improper insulin secretion, insufficient action of insulin or of both. Pathological changes of carbohydrate metabolism (sugar) causes unbalances in lipid metabolism (fat) as well as proteins. (Clavell, 2003). One of the therapies used to prevent this is physical exercise, which is known to lower blood sugar.

The beneficial effects of physical exercise in the case of diabetes have been largely acknowledged by physicians since the eighteenth century. After the discovery of insulin, an appropriate carbohydrate diet and physical exercise were the other two elements in treating diabetes. At present, diabetics are instructed to take up physical exercise, which is also recommended in specialised publications. (Mogos, 1990)

Research objectives:

- to establish which are the optimum exercises to be used in the kinetic programme used in compliance with the patients state (gradation, etiopathogenic context, levels of blood sugar);
- to establish the dos and don'ts in applying the kinetic programme as part of the patient's overall treatment (medication, physical, kinetic) of the patient;
- to establish the optimum number of sessions in a treatment programme;
- to establish the optimum period of using this therapy after which the patient's symptoms will improve;

- to elaborate a kinetic program which the patient could follow and do in their day-to-day life at home or at the workplace.

Research methods

1. Establishing the optimum physical exercises for the kinetic programme by considering the phases and the evaluation of the patients' state of health.
2. Establishing the number of repetitions, sets and the duration of the recovery programme.
3. Studying medical literature on the causes of diabetes
4. Studying references and research methodology in preventing diabetes-induced damage and finding evaluating tools which could be used in kinetic programmes.

Methods

- Reading the literature;
- Interviews;
- Observation;
- Tests;
- Trials;
- Results;
- Hypothesis.

This study proposes to demonstrate that the proposed kinetic programme contributes to regulating blood insulin levels and optimising the quality of life of the diabetic patient.

Results

Our research has been carried out with the help of 10 volunteers, aged between 32 and 58, with an average age of 45. By studying these cases we have come to know their condition and to understand the way in which the proposed kinetic exercises could be performed.

Tabel nr. 1. Members of experimental group

Nr.	Name and Surname	Gender	Age	Profession	Clinical diagnosis
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1	D.A.	M	58	consultant	Type 2 diabetes
2	C.A.	F	47	accountant	Type 2 diabetes
3	P.C.	F	34	tailor	Type 2 diabetes
4	G.M.	F	32	driver	Type 2 diabetes
5	J.D.	F	38	teacher	Type 2 diabetes
6	L.F.	F	53	engineer	Type 2 diabetes
7	P.H.	F	44	teacher	Type 2 diabetes
8	T.S.	M	47	owner	Type 2 diabetes
9	R.I.	M	42	labourer	Type 2 diabetes
10	C.R.	M	53	driver	Type 2 diabetes

Evaluating the diabetic patients included a full medical history, a full body exam, remarking on the modification that diabetes has on the body, as well as a full set of medical tests.

We evaluated:

- fatigue felt by patients
- diabetes-induced dizziness
- insulin levels
- weight loss

1. The first testing parameter is fatigue

Patient	1	2	3	4	5	6	7	8	9	10
Initial results	2	3	2	2	2	3	3	2	3	3
Final results	0	2	1	1	1	2	1	1	1	2

We have evaluated it on a scale of:

- light fatigue – 1
- medium fatigue – 2
- severe fatigue – 3

We obtained the following results:

Upon initial tests 5 patients from the experimental group complained of a degree of fatigue of 2 and the remaining 5 of a degree of 3.

We obtained the following results:

- 6 cases with a degree of fatigue of 1
- 3 cases with a degree of fatigue of 2
- 1 case of 0 fatigue

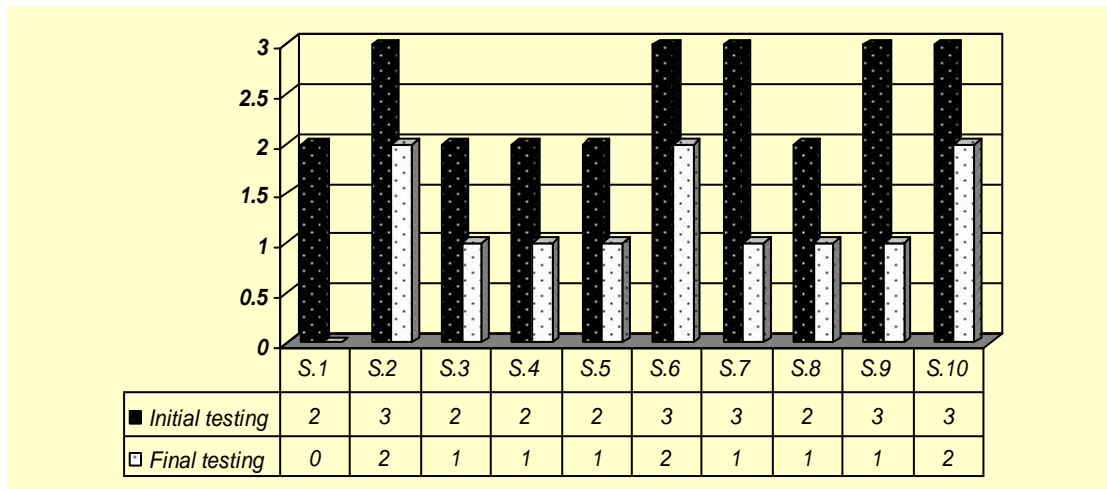


Chart .1. – Comparative analysis of results of fatigue

2. The second parameter in testing the experimental group was the degree of fatigue in patients with diabetes and hypertension. This was done through an evaluation of fatigue on a scale of:

- Light fatigue – 1

- Acute fatigue – 2

We obtained the following results:

6 patients from the experimental group reported a high threshold of dizziness and 4 patients complained of light fatigue.

Subject	1	2	3	4	5	6	7	8	9	10
Initial result	1 degree	1 degree	1 degree	2 degrees	2 degrees	2 degrees	2 degrees	2 degrees	1 degree	1 degree
Final result	1 degree	0 degree	1 degree	1 degree	1 degree	1 degree	1 degree	1 degree	0 degree	1 degree

The following results were obtained after the final test:

- 2 cases reported a level of dizziness of 0
- 8 cases reported a level of dizziness of 1

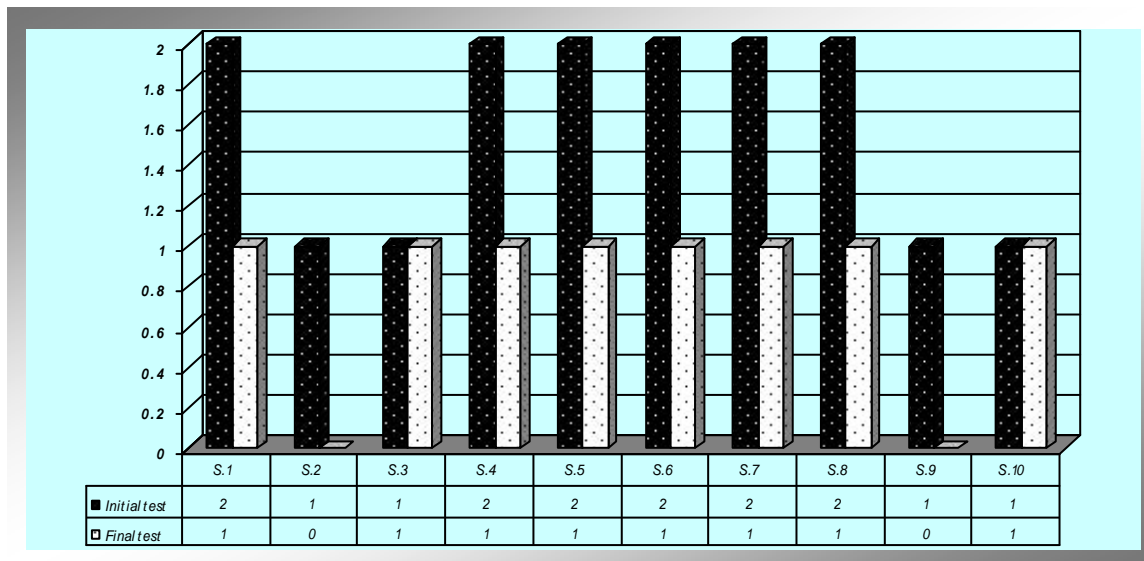


Chart.2. – Comparative analysis of results for dizziness levels

3. Concerning the level of blood sugar after finishing the kinetic programme, we obtained the following results:

Patient	1	2	3	4	5	6	7	8	9	10
Initial result	230 mg%	280 mg%	340 mg%	260 mg%	321 mg%	190 mg%	297 mg%	249 mg%	367 mg%	278 mg%
Final result	181 mg%	157 mg%	211 mg%	150 mg%	198 mg%	120 mg%	210 mg%	141 mg%	230 mg%	135 mg%
Difference	49 mg%	123 mg%	129 mg%	110 mg%	123 mg%	70 mg%	87 mg%	195 mg%	137 mg%	143 mg%

The results were:

- Patient 1 had a drop of 49 units in blood sugar levels
- Patient 2 had a drop of 123 units in blood sugar levels
- Patient 3 had a drop of 129 units in blood sugar levels
- Patient 4 had a drop of 110 units in blood sugar levels

- Patient 5 had a drop of 123 units in blood sugar levels
- Patient 6 had a drop of 70 units in blood sugar levels
- Patient 7 had a drop of 87 units in blood sugar levels
- Patient 8 had a drop of 195 units in blood sugar levels
- Patient 9 had a drop of 137 units in blood sugar levels
- Patient 10 had a drop of 143 units in blood sugar levels

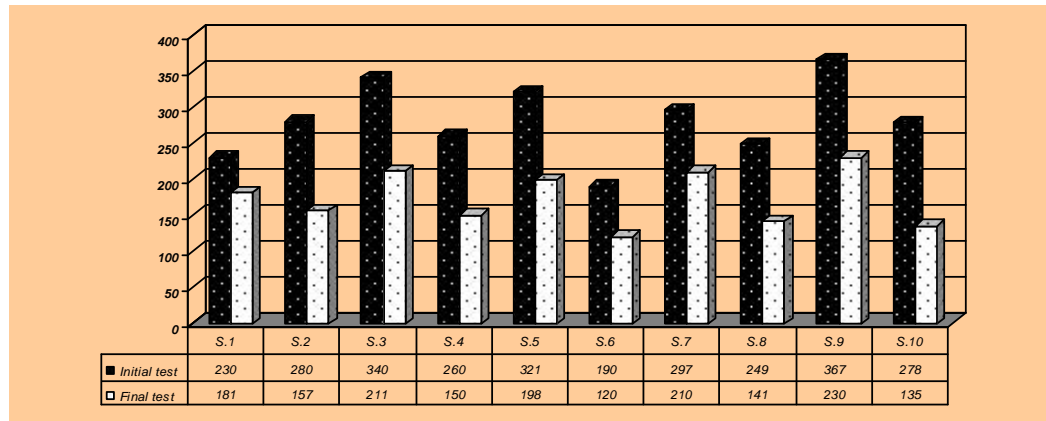


Chart.3. – Comparative analysis of blood sugar results

4. Weight loss after finishing the kinetic programme

Patient	1	2	3	4	5	6	7	8	9	10
Initial weight	97kg	111kg	89kg	98kg	88kg	75kg	93kg	102kg	107kg	90kg
Final weight	92kg	99kg	84kg	89kg	77kg	72kg	90kg	95kg	100kg	83kg

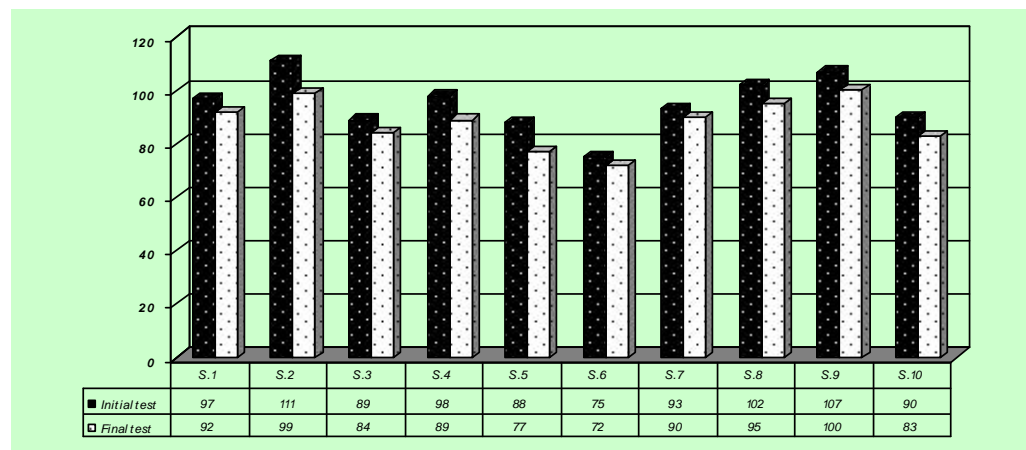


Chart.3. – Comparative analysis of results of bodyweight evaluation

Discussions

In his doctoral thesis entitled "Răspunsul imun și metabolic în relație cu exercițiul fizic" (*Immune and metabolic response in connection with physical exercise*), Chireac (2012) carried out a similar study concerning the influence of physical exercise on glycemic index. The first testing carried out on the experimental sample showed a total glycemia of 91.66 and after applying the physical exercises program, a reduction in glycemia values of 74.05 was seen.

Douglas (2012) carried out a study on the relation between physical effort and diabetes mellitus, stating that by making aerobic and anaerobic types of physical effort, a positive outcome in terms of reduction and normalization of glycemia in all the persons who practice physical exercise on a regular basis will be obtained.

The general state of health of the experimental group was evaluated by analysing the results obtained



concerning the level of fatigue, dizziness, blood sugar level and weight.

We agreed that physical exercise should be part of the daily routine of the patient and the secure interval of blood sugar for physical exercise is between 100 and 250 mg/dL.

After finishing the proposed kinetic programme, at the final testing, it was found that in 6 cases the level of fatigue was 1, in 3 cases it was 2 and in only one case the was none at all.

Concerning the level of dizziness, we have obtained the following results: 8 cases reported a level of 1 and only 2 cases no longer had this symptom.

Concerning the level of blood sugar, the average between initial and final test levels was 116 mg/dL which confirms the fact that the kinetic programme used has had beneficial effects on the health of the patients. After finishing the kinetic programme, the patients had lost in average 6,8 kg.

Conclusions

In current society, untreated diabetes represents one of the main causes of blindness, renal failure or amputation of lower limbs.

Also, conditions associated with diabetes such as high blood pressure or dyslipidemia represents risks of cardiovascular diseases.

The level of fatigue was lowered through kinetic programmes, in all patients at all times of evaluation, with a significantly low level in the experimental group.

The kinetic programme has had positive results in reducing dizziness as well as blood sugar levels and improving the state of health.

Through these results we have managed to underline the role of the kinetic therapist in evaluating and treating the effects of diabetes in order to establish the kinetic objectives, methods and means within the complex health recovery programme.

The early use of kinetic therapy through regular physical exercise is a good method to treat diabetes and to reduce the risk of developing such a condition.

Using kinetic exercises by overweight people keeps their blood sugar in check and the can lose weight. The loss of weight together with the physical exercise prevents the onset of type 2 diabetes in overweight people and quite often helps regulate blood sugar without any medication.

In conclusion, healthy people as well as diabetics can benefit from regular physical activity in order to maintain their weight within reasonable limits, help the body adequately assimilate sugar in the blood which will be efficiently used in the cells and tissues.

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