

THE CONTRIBUTION OF KINETIC THERAPY IN LOBSTEIN'S DISEASE

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Key words: kinetic therapy, Lobstein's disease, glass-bone disease.

Abstract: Osteogenesis imperfecta is a genetic disease of the connective tissue whose main clinical sign is increased bone fragility, manifested especially through fractures of the long limbs. OI presents major clinical signs and minor clinical signs.

a). Major clinical manifestations: skeletal deformities, blue sclera, dentinogenesis imperfecta (fragile and opalescent teeth).

b). Minor clinical manifestations: generalized ligamentous laxity, hernias, muscular hypotonia, hyperhidrosis, bruises that are frequent and appearing after minimum trauma.

At the moment the treatment of OI. falls into the following coordinates:

1. kinetic therapy; medical recovery;
2. medical treatment-treatment with aminobiphosphonates (aredia and nerixia);
3. orthopedic and surgical treatment of the fractures and bone deformities;
4. mesenchymal stem cell transplant from the red marrow.

Introduction

Osteogenesis imperfecta (O.I.), osteopsathyrosis, glass-bone disease, blue sclerae disease, brittle bones, congenital periosteal dysplasia are only a few of the names given to this disease.

Definition:

Osteogenesis imperfecta is a genetic disease of the conjunctive tissue whose main clinical sign is increased bone fragility, especially manifested through fractures at the level of the long bones. OI. presents major clinical signs and minor clinical signs.

a). Major clinical manifestations: skeletal deformities, blue sclera, dentinogenesis imperfecta (fragile and opalescent teeth).

b) Minor clinical manifestations: generalized ligamentous laxity, hernias, muscle hypotonia, hyperhidrosis, bruises that are frequent and appearing after minimum trauma.

Osteogenesis imperfecta is most often discovered with the occasion of a fracture, the patient suffers following a minor trauma, after starting walking. The trauma is most time insignificant or is entirely absent, the fracture occurring following a misstep or a wider movement.

Currently the O.I. treatment follows the coordinates:

1. kinetic therapy, massage, hydro-kinetic therapy, kinetic prophylaxis, thalassotherapy, occupational therapy
2. medication
 - treatment with aminobiphosphonates (aredia and nerixia);
3. orthopedic and surgical treatment of the fractures and bone deformities;

Kinetic therapy contributes to the removal or improvement of the suffering of children, offering them the joy of returning to normal as soon as possible.

Kinetic therapy acts to reestablish the reduced or lost functional abilities and facilitates the development of some compensatory and adaptation mechanisms, that ensure to the child a degree of family and social independence as high as possible.

Objectives:

Recovery in general, as well as kinetic recovery has a few specific objectives:

- preventing post-immobilization motor deconditioning
- regaining and maintaining the ability to exercise
- shortening the duration of convalescence and decreasing medical care expenses
- increasing the quality of the patient's life
- educating the parents regarding the arrangement of the living space as well as the first aid that must be granted in case of fractures.
- increasing muscle force.

Crt.	Name and	Age	Sex	Diagnostic	Occurrence
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no.	forename				mechanism
1.	A. R.	10	F	O.I.- right femur fracture 1/3 proximal with angulation;	Trauma 28.10.2009
2.	G. A.	11	F	O.I.- left femur fracture	Trauma 14.11.2009
3.	B. M.	9	F	O.I.- right humerus fracture	Trauma 01.11.2009
4.	N. D.	9	F	O.I.- femur fracture 1/3 proximal	trauma
5.	N. C.	11	F	O.I.- left humerus fracture	trauma
6.	R. C.	10	F	O.I.- right radial fracture 1/3 distal	trauma

Tab. No. 1. Presentation of the patient lot

Methods of research used

- Bibliographic study method
- Interview method
- Observation method
- Experiment method
- Locomotor apparatus evaluation and functional testing method:
 - ▶ evaluation of muscle amplitude
 - ▶ manual evaluation of the muscle force
- Graphic and image method
- Statistic analysis method

Unfolding of the research

I took into account in the period 15.11.-15.12.2010, six subjects diagnosed with Lobstein's disease, with close ages (it is interesting the fact that 5 of them are born in January), three of them being selected for the experimental group and the other three for the control group. The subjects were initially tested, after which the ones in the experimental group were submitted aside from the medication to a kinetic treatment as well. The patients in the control group only received medication, recommended by the doctor, their evolution being monitored with no other intervention.

In order to have a comparison, the subjects in these groups were selected two by two, on the criteria of showing as many mutual characteristics as possible, one belonging to the control group, and the other to the experimental group.

The patients of the experimental group for the period December 2009 – June 2010 followed a recovery program made of sessions of kinetic therapy, hydro-kinetic therapy, kinetic prophylaxis, occupational therapy, even from the first week after removing the plaster cast.

For the first period of the recovery program (the first three weeks) after the initial evaluation (that took place during the period 01-15.12.2009) the patients of the experimental group had a daily 40 minutes session. For the following 5 weeks the patients participated to 4 sessions of 50 minutes per week.

After week 8 I performed the first intermediary evaluation of the patients, and after week 16 I performed the second intermediary evaluation, during which time the patients took part in 3 – 4 sessions per week of 50 minutes, each of them being intertwined with hydrotherapy sessions. At the end of the period (middle of June) I also performed a final evaluation.

Analysis of the results

From the observations performed on the subjects (selected according to the same criteria), was clearly showed that the therapeutic means used together with the medication had special benefic effects, concreted in the improvement of the state of health.

In the first intermediary testing which took place after a period of 2 months, there was noticed an important difference among the two groups. The second intermediary testing (after another 2 months) came to show the results obtained after the second treatment stage, observing a difference of the values between the two groups (see charts)

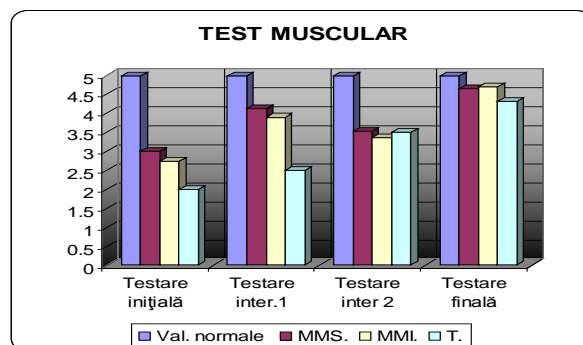
The efficiency of the treatment applied to the experimental group was also showed in the final testings (after 2 months), when the differences between the two groups increased.

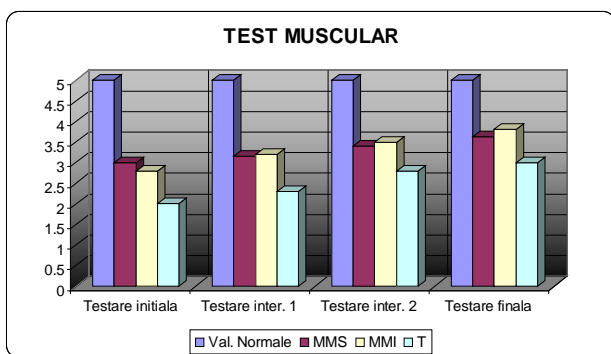
For each of the patients of the experimental groups the activity ended them moment the general objectives initially established were reached.

Testing muscle force

Chart no.:1, case 1 – experimental group.

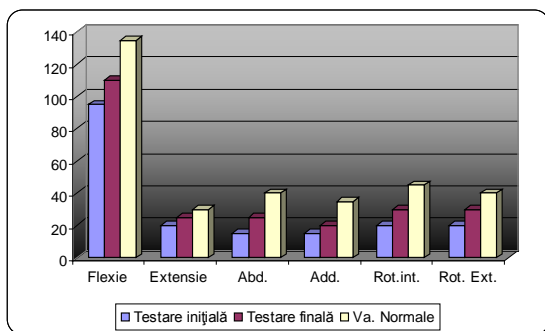
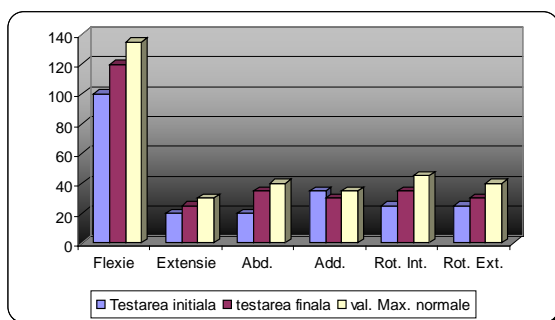
Chart no.: 5, case 1 – control group.





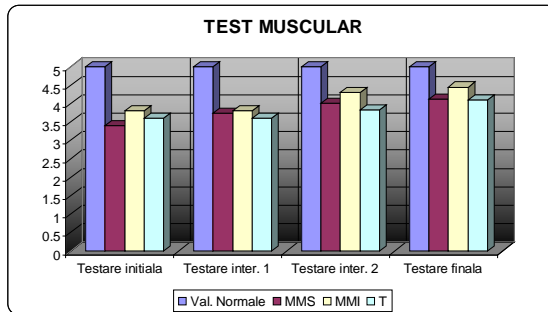
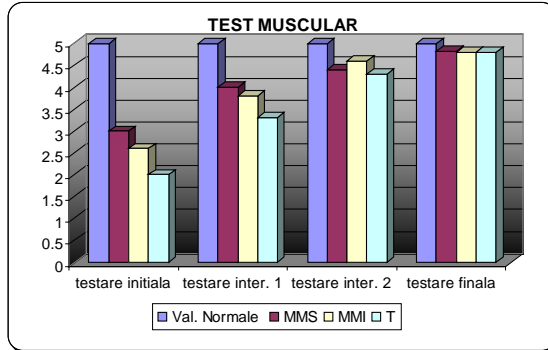
Goniometric testing

Chart no.: 2, case 1- experimental group Chart no.: 6, case 2 – control group.



Testing muscle force

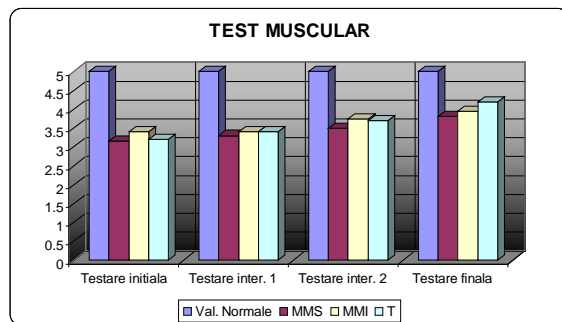
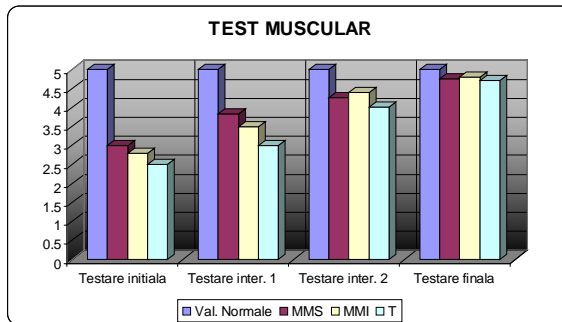
Chart no.:3, case 2 – experimental group Chart no.: 7, case 2 – control group.



Testing muscle force

Chart no.:4, case 2 – experimental group

Chart no.: 8, case 2 – control group.



Following the testings performed, (because of the generalized muscle hypothy) I obtained identical values both for the upper and the lower limbs, as a result I used the average values for interpreting the carts for the muscle force of the lower, upper limbs as well as of the torso.

In the case of the first pair of subjects it can be noticed that in the first intermediary testing the difference was considerable between the subject in the control group and the one in the experimental group. The difference was reduced in the second intermediary testing (cart no. 1 and chart no. 5) because of the fact that subject no.1 in the experimental lot suffered a fracture at the level of the lower limb – left femur, which lead to a long period of immobilization and also of decrease of the intensity of performing the physical exercise which determined a considerable decrease of the muscle force also presented in the periodical evaluation.

The final testing will highlight an increase of the values between the two subjects (see chart no.1 and 5), which is possible because of the fact that the subject in the experimental group has intensified the treatment in the fourth stage and had respected the indications given in regards to the post-immobilization recovery procedure.

In the case of the goniometric testing of the same pair (chart no.2 and no.6 in subjects no.1 in the experimental group, respectively control group), in chart no. 2 there can be noticed the fact that in the initial testing the subject in the experimental group had the values closet o the subject in the control group – chart no.6. at the end of the treatment period in the final testing there can be noticed a deference between the initial and the final values of the patients. For example: in the case of the extension in the subject in the experimental group in the initial testing it had a value of 15°, while in the final testing she obtained an increase of 10°, while in the case of the subject in the control group there was only noticed an increase of 5°.

In the case of subjects no.2 and no. 3 in the experimental group and respectively control group (charts no. 3 - 4 and 7 – 8) there can be noticed a lower value of the muscle force in the experimental lot (initial training) in relation to the higher values in the witness lot.

Following the performance of the program by the subjects in the experimental lot there can be noticed from one evaluation to the next the constant and more substantial progress (increase of the value of muscle force) in comparison with the subjects in the control group. Thus, in the final testing the subjects in the experimental group presented higher values than the values registered by the subjects in the control group.

Conclusions:

Following the complex kinetic approach constituted based on the active kinetic therapy, occupational therapy and hydrotherapy we reached the following conclusions:

- ensuring the regularity and continuity if the kinetic therapy and tertiary kinetic prophylaxis can avoid the periods of stagnation and regression in maintaining and even increasing the muscle force
- the improvement of the algic syndrome and decreasing the swelling are objectives we must consider and which must be solved in the shortest time in order to be able to apply the kinetic program under proper conditions;
- in the daily approach of the patient it is very important to consider the psychic state in that day, and the approach should be made so as to be able to obtain a maximum of results for the kinetic therapy session;
- the continuation of applying the recovery therapy consolidates the progress obtained, and perseverance can push the barrier of functional victories even further.

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Titlu: Contribuția kinetoterapiei în maladia Lobstein.

Cuvinte cheie: kinetoterapie, boala Lobstein, boala oaselor de sticla.

Rezumat: Osteogeneza imperfecta este o boala genetica a tesutului conjunctiv al carui principal semn clinic este creșterea fragilității osoase, manifestată în special prin fracturi ale membrilor lungi. OI prezintă semne clinice majore și minore.

- a) Manifestări clinice majore: deformări scheletice, sclera albastră, imperfecta dentinogenesis (dinti fragili și opalescență).
- b) Manifestări clinice minore: laxitate ligamentoasă generalizată, hernii, hipotonia musculară, hiperhidroză, vânătăi, care sunt frecvente și apar după traumatisme minime.

Titre: La contribution de la therapie cinétique dans la maladie de Lobstein.

Mots-clés: kinésithérapie, le maladie Lobstein, maladie de verre d'os.

Résumé: L'ostéogenèse imparfaite est une maladie génétique du tissu conjonctif dont le principal signe clinique est augmentation de la fragilité osseuse, qui se manifeste notamment par des fractures des membres de long. OI présente signes cliniques majeurs et mineurs.

- a). Major manifestations cliniques: des difformités du squelette, sclérotiques bleues, dentinogenèse imparfaite (dents fragiles et opalescente).
- b). manifestations cliniques mineures: la laxité ligamentaire généralisée, les hernies, une hypotonie musculaire, l'hyperhidrose, des ecchymoses qui sont fréquentes et qui sont survenues après un traumatisme minimal.