

The detection of T-lymphocytes and of their subpopulations by the rosette technique represents a progress in the study of these cells and has led to significant advances in our understanding of the pathogenesis of this disease. Further experiments are necessary to extend these observations.

Imunitatea mediată celulară a fost cercetată pe un grup de 68 bolnavi împărțiți în 3 grupuri în funcție de stadiul de evoluție al bolii. S-a demonstrat că în silicoză există dereglarea imunității. Detectarea rozetelor E și a rozetelor activate a fost realizată folosind metoda clasică.

Procentajul mediu al limfocitelor T totale a fost scăzut semnificativ statistic ($62 \pm 2\%$) ($p < 0.05$), comparativ cu grupul martor ($66 \pm 2.6\%$). Studiul în silicoză a arătat scăderea limfocitelor T ajutoare și creșterea limfocitelor T supresoare/citotoxice precum și scăderea raportului T ajutoare/T supresoare (1.32 ± 0.13), comparativ cu grupul martor (1.66 ± 0.04).

Prezența acestor variații în bolnavii cu silicoză sugerează participarea imunității mediate celulară în patogeniza bolii, înaintarea mediată celulară fiind direct responsabilă de evoluția silicozei.

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Antiinflammatory Effect of Laser Therapy in Rheumatoid Arthritis

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The effect of a 940-980 nm length wave laser radiation on rheumatoid arthritis was analyzed in 60 patients: 44 adults and 16 children. Each joint was daily treated by irradiation during 7 minutes for a period of 10 days. The evolution was estimated using an analogic scale with 3 steps for 2 parameters: local pain and local inflammation for each treated joint. The evolution was favourable in both aspects, but the inflammation seemed to be better influenced than the pain. The evolution was better in children than in adults. The inflammations of the interphalangeus, carpometacarpian and shoulder's joints were a better evolution than the knee inflammation. The serological data were not influenced by laser therapy. When relapse never the treated joint was affected again. No adverse or unwanted effects were observed during the treatment excepting a sedation and an increase of night sleep duration.

Previous data [1-5] showed a benefit effect of a therapy with a laser radiation of 940-980 nm wavelength in a series of rheumatic diseases such as painful back, osteoarthritis of the knee, and ankle painful shoulder, musculoskeletal and skin disorders. The analyzed data were suggesting a possible important influence on the inflammatory processes associated to the degenerative disorders characteristic for the studied pathology [1]. These suppositions were partially confirmed in an analysis of the effect of laser therapy in an experimental model of joint inflammation in rats [6] [7].

On the other hand there are in the literature on the field some data regarding an efficacy of the laser therapy in rheumatoid arthritis [3] [8-14] but it is difficult to say if the benefit effect is due to a proved analgesic effect [15-17] or/and to an antiinflammatory one [14] [18], with or without an influence on fibroblasts [19] or macrophages [20] activity.

The present work intends to verify if laser therapy is effective in rheumatoid arthritis, if it is possible a prognostic of the efficacy of this therapy depending on the pathological particularities.

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MATERIAL AND METHOD

Apparatus. A GaAs laser was used. The device was emitting a coherent radiation with 940-980 nm length waves and was developing a power of 50 mW.

Patients. A total of 60 patients were analyzed: 44 adults hospitalized in the Medical Clinic of the "N. Gh. Lupu" Hospital and 16 children hospitalized in the "A. Ruseanu" Clinic of Pediatrics, both from Bucharest. Eight patients were males and 52 females. The total number of treated joints was 118:8 at the vertebral column, 12 at the shoulder, 40 at the knee, 14 carpometacarpian joints, 4 at the hip and 40 interphalangeal joints of the hand.

Experimental design. Each joint was daily treated by irradiation during 7 minutes with the above described laser radiation for a period of 10 days. The patients evolution was estimated using an analogic scale with 3 steps for 2 parameters: local pain and local inflammation for each treated joint. Each parameter received a maximal 2 score at the beginning of the treatment and thereafter the score was appreciated on the third, seventh and tenth day of the treatment. There were also analyzed the common biological data at the beginning and the end of the treatment. Some of these patients were reevaluated when they were rehospitalized.

Statistical analysis. The mean values and standard deviations were computed for each determination of each parameter and joint treated. Statistical significance of the differences between means was appreciated using one way analysis of variance (ANOVA). The differences between means were considered significant only if $p < 0.05$.

RESULTS

The results of the research are summarized in Figs 1, 2 and 3.

In Fig. 1 it is presented the comparative evolution of the pain and of the inflammation for all the treated joints during the treatment. During the 10 days of treatment the evolution was a favourable one in both aspects, pain and inflammation. However, the inflammation seems to be better influenced than the pain.

Figure 2 presented the evolution of pain and of the inflammation during the 10 days of treatment as a comparison of the adult patients and children. It can be seen that the evolution was better in children than in adults but in both the inflammation was stronger influenced than the pain.

In Fig. 3 is presented the evolution of the pain and inflammation during the 10 days of treatment as a comparison among four joints: interphalangeal of the hand, carpometacarpian, shoulder and knee. The inflammations of the interphalangeal, carpometacarpian and shoulder's joints were a better evolution than

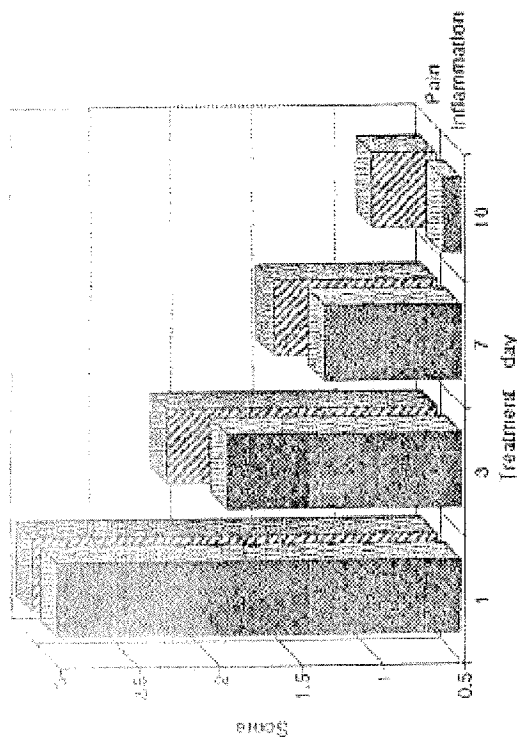


Fig. 1. - Comparative evolution of the pain and of the inflammation for all the treated joints during the treatment. Each bar presents the mean score of the pain or inflammation in the first, third, seventh and tenth day of the treatment ($n = 118$ treated joints).

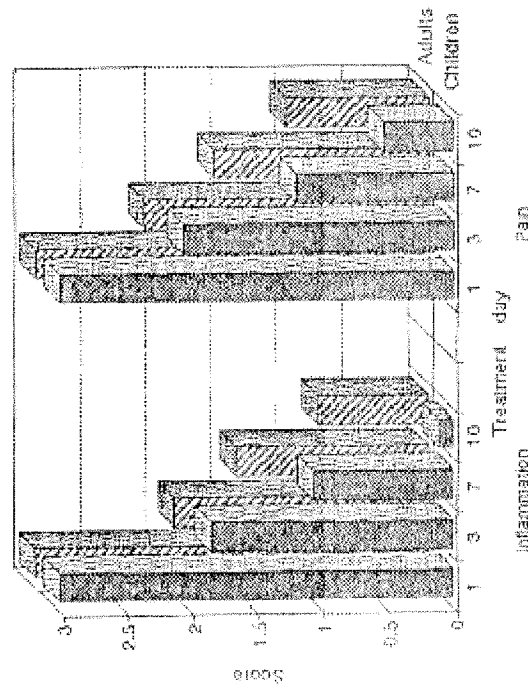


Fig. 2. - Evolution of the pain and of the inflammation during the ten days of treatment as a comparison between the adult patients and children. Each bar presents the mean score of the pain or inflammation in the first, third, seventh and tenth day of the treatment for the adult patients ($n = 44$) and children ($n = 16$).

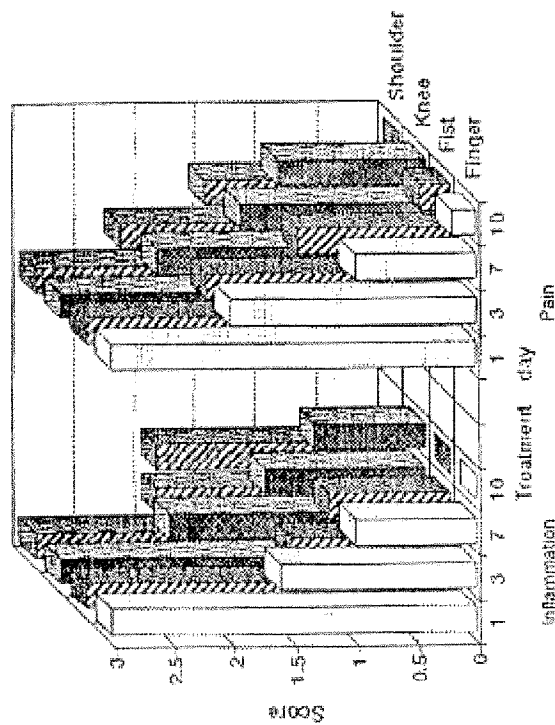


Fig. 3. The evolution of the pain and inflammation during the 10 days of treatment as a comparison among four joints: interphalangeal of the hand, carpometacarpian, shoulder and knee. Each bar presents the mean score of the pain or inflammation in the first, third, seventh and tenth day of the treatment for the interphalangeal joints of the hand ($n = 40$), the carpometacarpian joints ($n = 14$), the shoulder ($n = 12$) and the knee ($n = 40$).

the knee inflammation. In all treated joints the inflammation was stronger influenced than the local pain. The inflammation of the shoulder slower responded to the treatment: after 7 days of treatment the inflammation of this joint was not so well influenced as the other joints. However, after 10 days of treatment the shoulder joint was the best influenced.

The serological data were not influenced by laser therapy.

Some of the treated patients were rehospitalized for a new attack of the disease. Never the treated joint was affected again. In all cases other joints than the treated joints were affected in a new attack.

No adverse effects were observed during the treatment. Only an unwanted effect: some of the patients accused sedation and an increase of night sleep duration.

DISCUSSIONS

The above presented data show that the treatment with laser radiation with the above presented characteristics had a favourable effect on the inflammations of the joints in patients with rheumatoid arthritis. All treated joints presented a

favourable response to the treatment but the response had not the same intensity in all patients.

The rule was that the adult patients presented a worse response than the children and in adult there were situations in which the response was not complete that it was not the case in children. It is possible that in child the pathological modifications produced by the disease were not so important as in the adult patients.

There were also differences concerning the response to the treatment not of the affected joints. The minimal response was registered to the knee perhaps because this joint is the most solicited. The scapulo-humeral joint presented a good response but after a relatively long latency: in the 7th day of treatment the joint presented the worse response, but in the 10th day of treatment the same joint in that presented the best response. This seems to be a very good response but after a long latency.

In all cases the inflammation was stronger influenced than the pain. It is true that the inflammation is objectively appreciated by the physician whereas the pain is a thing subjectively appreciated by the patient. However, our previous data obtained in an experimental model of inflammation in rats (Fulga rat) suggest that the laser therapy has an antiinflammatory effect.

The antiinflammatory effect of the laser therapy seems to be a local one, but with a long duration. The laser therapy influences only treated joints, does not influence the laboratory tests for inflammation (fibrinogenemy, ESR, a.o) and does not influence the appearance of new attacks of the disease.

The local antiinflammatory effect of the laser therapy seems to be very persistent in time: all patients who presented new attacks of the disease presented other joint in affected than in previously treated by laser irradiation.

None of the patients presented adverse effect except a sedation and an increase of the duration of the total sleeping times in 24 hours. It is difficult to explain this unwanted effect. It is possible to contribute the analgesic effect but it is also possible to contribute a myorelaxant one. This sedation and increasing of the duration of the sleeping times are not disagreeably resented by the patients.

CONCLUSIONS

We appreciate that the local irradiation with a laser radiation with a 940-980 nm wavelength, with a power of 50 mW, has favourable effect in rheumatoid arthritis.

The benefit seems to be due particularly to an antiinflammatory effect but could participate also a myorelaxant one.

The effect seems to be present for a long period of time.

This treatment does not influence the disease from the serologic point of view and does not prevent the relapses of the disease but on relapse other joints than treated are involved. However, patients were investigated only two years. We cannot say in the treatment influence the anatomical modifications produced by the disease.

No adverse or unwanted effect was observed excepting a sedation and an increase of the duration of the total sleeping times in 24 hours.

S-a studiat efectul tratamentului cu radiație laser cu lungimea de undă de 940-980 nm pe un lot de 60 de bolnavi cu poliartrită reumatoidă: 44 adulți și 16 copii. Fiecare articulație a fost tratată prin trăsere zilnică timp de 7 minute pe o perioadă de 10 zile. Evoluția a fost apreciată pentru fiecare articulație tratată urmărind doi parametri - durerea și inflamația locală - cu ajutorul unei scale analogice în 3 trepte. Evoluția sub tratament a fost favorabilă sub ambele aspecte, dar inflamația a părut mai puternic influențată decât durerea locală. Evoluția a fost mai bună la copii decât la adulți. Inflamațiile articulațiilor interfalangiene, metacarpofalangiene și a umărului au fost mai puternic influențate decât inflamația genunchiului. Datele serologice nu au fost influențate. Când au apărut recăderi, articulațiile tratate anterior nu au mai fost niciodată afectate. Nu s-au înregistrat reacții adverse sau efecte ne dorite cu excepția unei sedări și a creșterii perioadelor de somn nocturn pe perioada tratamentului.

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