A PATHOGENETIC RATIONALE FOR MAGNETIC-INFRARED LASER THERAPY OF RHEUMATOID ARTHRITIS

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Rheumatoid arthritis (RA) remains a crucial challenge in rheumatology, as no cure of it is in sight. RA is one of the most common inflammatory diseases affecting young and middle-age people. Its progress is unrelenting and leading to early disability of young individuals (at 5-6 years following the onset). Therefore, it is a pressing problem to find a new therapeutic approach, especially a basic intervention.

Matveikin et al. (1989) argued that all available therapeutic modalities relying on stabilization of inflammation fail to stop progressive destructive cartilage and bone abnormalities whose severity largely determines the outcome of structural and functional damage of joints. Moreover, extensively employed glucocorticoids, cytostatics and even nonsteroidal antiinflammatory drugs have been reported to have osteolytic and calciuretic effects which can promote joint surface destruction in RA (Agababov et al., 1989). Therefore, "classical" methods do not influence local and systemic osteoporosis which occurs in respectively 22-28 to 72 percent of patients with RA (Korshunov et al., 1995; Skripnikov et al., 1997). On the other hand, there is evidence to suggest that severity of osteoporosis (OP) does not provide a measure of severity of the primary disease. Certainty on this issue has important implications for prognosis and therapy of RA.

Numerous indepth studies indicate the need for osteoprotective treatment in the presence of RA (Nasonova, 1983; Nasonova and Sigidin, 1985; Revel, 1993; Nasonov, 1994; Franke adn Runge, 1995; Nasonov et al., 1997; Deuchaisnes et al., 1973; West et al., 1994).

Therefore, it is very important from both research and practical perspective to adopt therapeutic regimens which would have immunocorrective effects on the one hand and would improve bone resistance to destructive action of pannus and slow down bone mass loss on the other, with minimum side effects.

This line of research is pursued everywhere in the world. Over the recent years, inclusion of antiosteoporotic drugs as a basic therapy of RA or its component has proved fairly effective (Bolotina, 1997; Doroshenko and Korochina, 1996, 1997; Zonova et al., 1997; Mazurov et al., 1997; Gavrilovski, 1996; Jezicrinska et al., 1996; Szombati et al., 1996). Based on reported and our own clinical experience, we have proposed in 1997 a scheme for osteoprotective therapy individualization.

However, confronted by side effects of drugs, numerous contraindications and individual intolerance, we came to magnetic-infrared laser (MIL) therapy.

Since RA is an immune-inflammatory disease, various laser treatments are usually aimed at correction of immune and inflammatory abnormalities (Gracheva and Satinaeva, 1988; Yarema, 1989; Klushin, 1990; Babynina and Volobuyeva, 1988; Ferrel et al., 1996). Surgical laser interventions, intravenous and transcutaneous manipulations have been used (Dzyak and Simonova, 1988; Plotguin et al., 1996; Grazhane et al., 1989; Skobelkin et al,, 1990; Basford, 1993).

Laser therapy has been used in children and old patients with RA (Keltsev et al., 1988; Sinepesov et al., 1989). Results of these uses of the laser have been doubtless good.

Since studies used lasers with different characteristics, available evidence is heterogeneous and difficult to compare.

RA response to MIL therapy has been reported (Velitchenko, 1995; Demidov et al., 1995). However, apart from the task of quenching the activity and severity of RA, we are confronted by the problem of improving "internal" bone resistance to rheumatoid aggression to save joints in RA.

Studies reporting the efficacy of laser, magnetic and ultraviolet therapy in osteoporisis are few (Mitbreit et al., 1978; Zatsepin et al., 1984; Anishchenko and Yevtifeeva, 1988; Laing et al., 1995). In addition, these interventions have been reported to hasten fracture consolidation (Polonsky et al., 1979; Shakhov, 1995), suggesting an antiosteoporotic effect of the MILTA device.

Our study sought to elucidate whether MIL therapy has an osteoprotective effect apart from immunostabilizing, antiinflammatory and analgesic actions.

To evaluate the possibility of impeding destruction of osseous structure s of joints in RA, were used combined treatment regimens. RA patients of all groups received nonsteroidal antiinflammatory drugs (NSAID), but no other basic drugs.

Group 1 patients were on NSAID and the antiosteoporotic plant-derived drug osteochin (Sanofi, France) which was earlier used in systemic OP.

In **group 2**, NSAID-osteochin (OC) combination was adjuncted by conventional regimens of MIL therapy (Soroka, 1988; Korepanov, 1995).

Group 3 patients received NSAID and MIL therapy, with antiosteoporotic drugs withheld because of intolerance or contraindications. Table 1 presents clinical characteristics of these patients.

Table 1. Clinical characteristics of study patients

Characteristic	NSAID+OC N=15	NSAID+OC+MILTA N=15	NSAID+MILTA N=15
Mean age (yr)	37.40±2.3	39.12±2.2	36.5±1.9
Mean disease duration (yr)	4.2±1.5	4.6 ± 1.9	5.16 ± 1.9
Mean RA activity (grade)	2.3 ± 0.4	2.1 ± 0.4	2.4 ± 0.5
Mean RA stage (X-ray)	2.3 ± 0.8	2.4 ± 0.8	2.4 ± 0.7
Functional failure (mean arbitrary grade)	1.8 ± 0.2	1.7 ± 0.2	1.9 ± 0.2

Repeat MIL courses were given to all patients at two months. Clinical and laboratory test improvement was seen in all patient groups at 6-8 months, but the effect was best in NSAID+OC+MILTA group. Pain severity and RA activity markedly subsided, and articular functional failure did not deteriorate in these patients. Of special importance, roentgenological RA grade did not progress in this group.

Table 2. Follow-up clinical, roentgenological and laboratory findings in patients with RA

Indices	NSAID+OC		NSAID+OC+MILTA		NSAID+MILTA	
	before	after	before	after	before	after
RA activity(grade)	2.1	1.9	2.2	1.5	2.1	1.6
Roentgenological stage of RA	2.2	2.3	2.3	2.3	2.2	2.4
Functional failure (grade)	1.7	1.7	1.8	1.8	1.7	1.9
Pain index (score)	2.9	2.5	2.9	2.4	2.9	2.5
Articular index (score)	2.7	2.5	2.8	2.6	2.8	2.7
Inflammatory index (score)	1.4	1.2	1.4	1.1	1.3	1.2
Morning stiffness (min)	96	74	106	84	92	82
Functional Lee test (score)	24.5	24.1	25.1	24.2	24.8	24.6
Stanford health index (score)	47.4	45.4	43.2	40.7	45.8	45.2
Visual pain scale	7.7	4.7	7.6	4.4	7.8	4.9
General weakness (score)	2.6	1.5	2.8	1.5	2.5	2.0

CONCLUSION

Magnetic-infrared laser therapy of rheumatoid arthritis is effective and pathogenetically relevant.