A COMBINED REHABILITATIVE PROGRAM IS EFFICACIOUS IN THE TREATMENT OF HANDS OF SYSTEMIC SCLEROSIS PATIENTS

S. Maddali Bongi[1], A. Del Rosso[1], F. Galluccio[1] , F. Sigismondi[2] I. Miniati[1], ML Conforti[1], M. Matucci Cerinic[1]

Department of BioMedicine, Division of Rheumatology, Denothe Centre, Careggi Hospital (AOUC), University of Florence, Italy.
AMuRR (Associazione Multidisciplinare Riabilitazione Reumatologica), Blue Clinic Rheumatic Rehabilitation Center, Florence, Italy.

BACKGROUND

In Systemic Sclerosis (SSc), the most frequent hand involvement is due to skin thickening, leading to contractures of the fingers and resulting in a claw-type deformity with metacarpophalangeal extension, interphalangeal flexion, and thumb adduction.

Despite the consequent loss in hand mobility and functionality may lead to impairment in quality of life (HRQoL) and in activities of daily living, only few rehabilitative approaches on hands of SSc patients were tried.

An individualized rehabilitation program composed by therapist-guided exercises, occupational therapy and physical therapy was effective in improving quality of life, exercise tolerance and hand mobility in SSc patients [4].

We found that the combination of Kabat's technique, connective massage and a specific kinesitherapy program was useful for the treatment of facial involvement in a little group of SSc patients. [5].

AIM

to evaluate the efficacy of a combined rehabilitation program specifically conceived for SSc hands, based on connective tissue massage, Mc Mennell joint manipulation and home daily exercise compared to a home daily exercise program.

METHODS

40 SSc patients (10 males and 30 females; age and disease duration: 57.8 ± 11.8 and 9.0 ± 3.8 years, respectively) with hand stiffness and loss of joint function due to flexion contractures were enrolled. 20 (Interventional Group) were treated for a 9 week period (twice a week, 1 hour per session) with a program based on connective tissue massage, Mc Mennell joint manipulation and home exercises for the hand (once a day, 20 minutes per session) and 20 (Control Group) were assigned to the home exercise program only.

REHABILTATION TECHNIQUES

Connective tissue massage treats altered connective tissues in order to modify local bloodstream and detach involved tissue by connective tissue stretching [6]. The treatment starts with the massage of forearm (Fig. 1a–c) and hand (Fig. 1d) and lasts about 10 min per limb. If necessary, after Mc Mennell manipulations, other 5 min of massage can be performed.

Mc Mennell joint manipulation is a technique aiming to recover the "joint play", i.e. the involuntary, subtle range of motion that normal joints display on multiple planes, necessary for normal voluntary joint mobility. It improves articular movement, reduces pain and stretches articular capsulae and ligaments [7]. Treatment starts with wrist manipulations on frontal and radial side diastasis (Fig. 2a, b) and continues with the manipulations of the MCP (Fig. 2c, d) and interphalangeal joints (Fig. 2e, f) lasting 15 min per side.

Home daily exercises. Patients perform 1 session/day (lasting 20 min) of active exercises for the hand, consisting in movements of the fingers and fine movements of the hand like flexion and extension of the single fingers, adduction and abduction of the fingers (Fig. 3h,i), terminal and subterminal pinches with all fingers in opposition to thumb (Fig. 3f, g), movements of flexion, extension, ulnar and radial deviation of the wrist (Fig. 3b–e) and pronation and supination of the forearms.

ASSESSMENT

Patients of both groups were evaluated at baseline (T0), after 9 week (T1) and at a 9 weeks follow-up (T2):

• **for hands involvement** by Hand Mobility in Scleroderma (HAMIS) Test, Duruöz scale, fist closure and hand opening;

• **for quality of life** by Physical (PSI) and Mental Synthetic Index (MSI) of SF-36 and HAQ disability index.
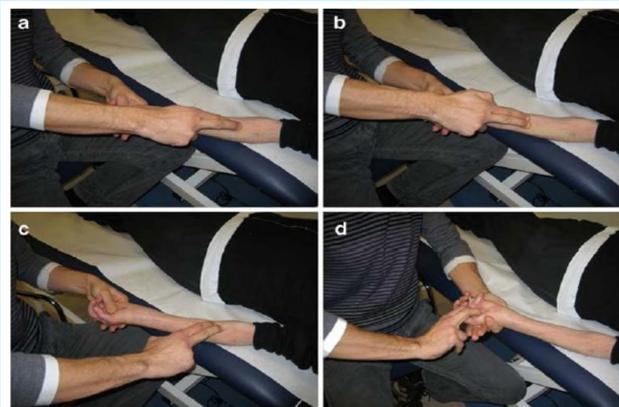

Fig. 1   Connective tissue massage of the forearm (a–c) and of the hand (d)
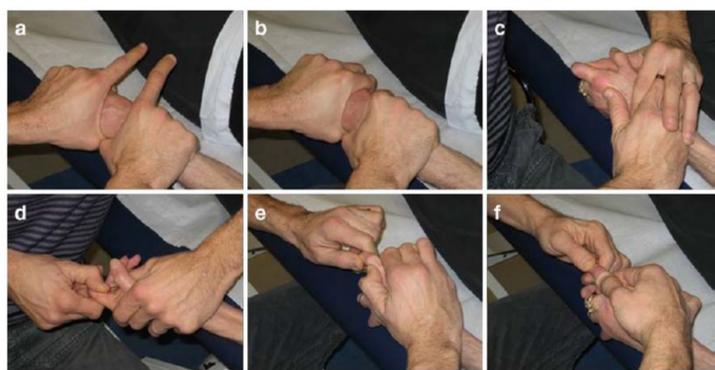

Fig. 2. Mc Mennell: wrist manipulations on frontal and radial side diastasis (a, b), manipulations of the MCP joints (c, d) and of the interphalangeal joints (e, f)
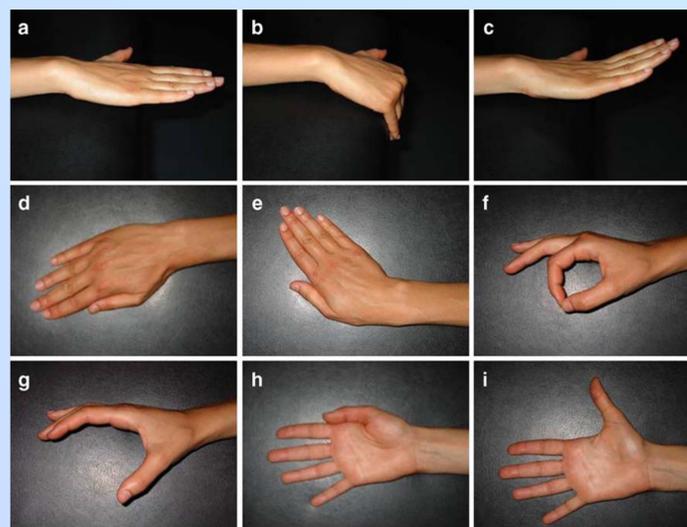

Fig. 3   Home exercises. Start position (a), flexion (b), extension (c), radial and ulnar deviation of the wrist (d, e),terminal and subterminal pinches with all fingers in opposition to thumb (f, g), adduction and abduction of the fingers (h, i)

CONCLUSIONS

The combination of connective tissue massage, Kabat's technique, home exercise and kinesitherapy is more effective than a home exercise program alone in the rehabilitative treatment of SSc facial involvement.

RESULTS

Baseline characteristics were similar in patients of Interventional and Control Group (tables 1 & 2). No drop out from the study was registered.

In **Interventional Group**, the rehabilitative combined treatment improved significantly fist closure, HAMIS test and Duruöz scale at T1, and the results were maintained at T2. HAQ, PSI and MSI of SF-36 ameliorated significantly at T1, but only HAQ improvement was maintained at T2.

In **Control Group**, only fist closure was improved by home daily exercises at T1, with the results not confirmed at T2. HAMIS test, Duruöz scale, hand opening as well as HAQ, PSI and MSI of SF-36 were not modified by the treatment.

Table 1. Items assessed at baseline (T0), at the end of treatment (T1) and after 9 weeks of follow-up (T2) in Interventional Group

	T0	T1	T2	T0 -T1	T0 -T2
	Mean± SD	Mean ± SD	Mean ± SD	p	p
HAMIS	11.4± 6.6	7.0± 6.8	7.8± 6.4	<0.0001	<0.0001
Duruoz	33.0± 24.9	20.3± 21.6	22.1±21.0	<0.0001	<0.0001
Hand opening*(cm)	15.6± 1.1	16.0± 1.4	15.57± 1.6	NS	NS
Fist closure* (cm)	2.24 ± 1.6	1.47 ±1.4	1.45±1.2	<0.0001	<0.0001
MSI	37.3 ± 5.5	41.53 ±8.0	38.79 ±5.8	<0.001	NS
PSI	34.0 ± 7.9	38.84± 8.8	36.9 ±8.1	<0.0001	NS
HAQ	0.94 ± 1.0	0.57 ± 0.8	0.55 ±0.8	<0.0001	<0.001

Legend. MSI =SF36 Mental Synthetic Index ; PSI =SF36 Physical Synthetic Index; HAQ= Health assessment questionnaire; *Mean values between right and left hand

Table 2. Items assessed at baseline (T0), at the end of treatment (T1) and after 9 weeks of at follow-up (T2) in Control Group

	T0	T1	T2	T0 -T1	T0 -T2
	Mean± SD	Mean ± SD	Mean ± SD	p	p
HAMIS	10.75± 4.6	11.10± 4.6	10.95 ±3.9	NS	NS
Duruoz	31.8 ± 18.8	32.5 ±18.4	33.2±17.9	NS	NS
Hand opening*(cm)	15.34 ± 1.3	15.18 ±1.4	15.29 ±1.5	NS	NS
Fist closure* (cm)	2.20 ± 1.1	1.19 ±1.0	2.19 ±1.0	<0.0001	NS
MSI	39.1 ±5.3	38.75 ±7.1	39.60 ±6.4	NS	NS
PSI	38.8 ± 9.7	36.73±9.3	34.83±7.4	NS	NS
HAQ	0.69 ± 0.8	0.61± 0.8	0.47± 0.4	NS	NS

Legend. MSI =SF36 Mental Synthetic Index ; PSI =SF36 Physical Synthetic Index; HAQ= Health assessment questionnaire; *Mean values between right and left hand

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