In SSc, the most important rehabilitative problems arise from skin induration and joint and muscle involvement. Skin fibrosis and retraction cause deformations and reduction of functionality of hands and face leading to disability and impairing activities of daily living, quality of life (QoL) and psychological well being. Face involvement also causes temporal changes and loss of self-image.

Despite this, only few rehabilitative approaches on SSc patients were tried. A rehabilitation program composed of therapist-guided exercises, occupational and physical therapy improved QoL, exercise tolerance and hand mobility in SSc patients [1]. A combination of connective massage, Mc Mennel technique and specific kinesitherapy was useful for treating hand involvement in SSc patients. [2]. Manual Lymph Drainage (MLD) reduced hand edema and stiffness in oedematous phase and improved quality of movement and daily activities [3].

Microstomia was treated with exercises of mouth-stretching and oral augmentation [4-5] and the combination of Kabat's technique, connective massage and a specific kinesitherapy program was useful for facial involvement in SSc patients. [6].

**METHODS**

20 SSc patients (7 males and 13 females; age and disease duration 57.1 ± 15.0 years and 9.0 ± 4.1 years, respectively) were enrolled and randomly assigned to 2 groups. Interventional Group (10 pts) underwent a rehabilitation program including hand (connective tissue massage and Mc Mennel joint manipulation (and, for 4 pts with edematous hands, manual lymph drainage-MLD) and face treatments (Kabat's method, connective tissue massage and kinesitherapy), both performed 1 hour/session, twice a week, and at least a global rehabilitation technique such as hydrokinesitherapy (7 pts) or land-based kinesitherapy (3 pts), both executed for 1 hour/session, once a week, and comprising respiratory exercises. Observational Group (10 patients) was only provided with educational advices and medical information about SSc.

**REHABILITATION TECHNIQUES**

**HANDS**

- Connective tissue massage: manual technique used to treat altered connective tissues, in order to increase local bloodstream and relax infiltrated tissue by stretching applied on the hands and forearms (10 minutes-min./side). If necessary, after Mc Mennel manipulations, 5 more minutes of massage might be performed (Fig 1a,b). Mc Mennel joint manipulation: aims to recover the "joint play", i.e. the involuntary, subtle range of motion displayed by normal joints on multiple planes, necessary for normal voluntary joint mobility. It improves articular movement, reduces pain and stretches articular capsule and ligaments. It consists in manipulations on wrist frontal and radial side diastasis and on metacarpophalangeal and interphalangeal joints (15 min./side)[Fig 1c,d].

**GLOBAL TECHNIQUES**

- Hydrokinesitherapy: performed in a 30° pool (1 hour/session) composed by 10 minutes warm up: 20 min. of stretching and pulmonary rehabilitation; 20 min. for treatment of local and global pain (individualized exercises increasing mobility, muscle strength, body awareness, coordination and balance): at the end: 10 min. relaxing hydro massage bath (Fig 2a,b).

**RESULTS**

The clinical features of SSc patients in Interventional and Observational Group were similar and no drop out from the study was registered.

**Interventional group (Table 1):**

Patients improved significantly, at T1 in MSI (p<0.005), PSI (p<0.05) of SF-36 and in HAQ (p<0.05), Duruoz scale (p<0.01), fist closure: (p<0.05), mouth opening in centimetres (p<0.05) and the 16-Item Face Margination (VAS-Face) (p<0.002).

At T2, the statistical significance was lost for almost all the items assessed, excepted HAMIS test (p<0.01) and mouth opening (p<0.01).

Four SSc patients with oedematous hands, treated with MLD, improved in hand oedema and edema-related symptoms (data not shown).

**Observational group:**

Patients did not show any significant improvement in general health condition, hands and face measures at T1.

**CONCLUSIONS**

The association of district-specific and global rehabilitative techniques conceived and tailored for SSc patients improves global health status, hand and face disability and functionality, with its effects partially maintained at follow-up.

To maintain the results, we advise to add a home self management program after the end of the treatment.

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