

Rehabilitation in Multiple Sclerosis

Introduction

Multiple Sclerosis (MS) is a chronic inflammatory-demyelinating disease of the central nervous system leading to progressive impairment of various CNS systems. During the course of the disease a wide range of functional impairments and disabilities may develop which lead to psycho-social handicap and reduction of quality of life. New drugs such as beta-interferons and glatiramer acetate can modify the long term course of the disease by lowering relapse rate and slightly slowing progression of disability. Nevertheless the progressive course and early onset of MS with long survival time can have significant consequences on personal activities, social participation and quality of life. So for example, 15 years after disease onset 15% of MS patients need technical aids for walking and 29% use a wheelchair¹. During the first 10 years after diagnosis 50–80% are out of work² and the socio-economic consequences of all this have only recently been addressed. The direct and indirect yearly costs amount to 90,000 Euros per patient per year, 17% of severely disabled MS patients requiring 50% of direct costs and 6.5% are living in institutions³. Health related quality of life in MS patients with moderate and severe disability is generally low, leading to a high level of depression⁴.

The goal of rehabilitation is to reduce the consequences of the disease on function, personal activity, and social participation in order to allow the patients as much independence as possible with the highest possible quality of life. Evaluation of efficacy of rehabilitation in MS is particularly difficult: the disease course varies greatly between and among individuals and is difficult to predict in different forms of the disease (relapsing-remitting, secondary progressive, primary chronic progressive). Triggers of relapses and progression are not well defined and the pathological processes (inflammation, demyelination, axonal loss, remyelination) may be heterogeneous and can not be discriminated accurately with standard neuro-radiological techniques⁵, in particular, findings on MRI correlates poorly with the degree of disability. Therefore it is difficult to find a homogeneous patient group which satisfies scientific requirements for evaluating the efficacy of therapeutic interventions. This may explain the small number and methodological problems of studies published to date concerning the outcome of rehabilitation measures in Multiple Sclerosis. Earlier studies were mainly uncontrolled, and most were retrospective observations on small, heterogeneous patient groups⁶⁻⁹. More recently a few controlled trials have been published on this subject^{5,10,11}, only some of them, however, assess the impact on quality of life.

Comprehensive inpatient rehabilitation

Although treatment modalities vary in different rehabilitation centres, a consensus has been reached concerning the requirements and most important components of a rehabilitation programme^{12,13}. Due to the broad spectrum of symptoms and disabilities, a comprehensive assessment of functional impairments and personal goals is essential in order to assemble an individually adapted, multidisciplinary, task and goal orientated therapy programme¹⁴. The therapeutic interventions themselves are only one part of the rehabilitation programme but of equal importance is the careful informative instruction of patients and their relatives in order to plan the needs after discharge.

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Management of specific symptoms and impairments such as spasticity and bladder dysfunction is also crucial in MS patients. Furthermore the use of medical and social resources may contribute to improving quality of life of patients and their relatives. Measuring outcome with adequate assessment systems is not only necessary from a scientific point of view but allows validation of efficacy of therapeutic modalities and adaptation or development of new therapies.

In an early prospective, uncontrolled study 20 chronic progressive MS patients not responding to outpatient therapy, achieved a significant improvement in various disability scores after an inpatient multidisciplinary rehabilitation programme of 53 days duration⁶. Another uncontrolled study showed a significant improvement using a short-term inpatient rehabilitation (15 days, N=79) programme on the different course patterns of MS, which lasted more than 3 months after discharge⁸. The benefit was more marked in patients with relapsing-remitting disease but significant improvements could also be documented in patients with progressive disease. These positive findings were confirmed in a later study⁵ which was a prospective randomised, controlled study in which 32 patients underwent a 3 week inpatient multidisciplinary rehabilitation programme whilst the control group (N=34) were patients on a waiting list who were admitted for rehabilitation later. Patients were examined at the beginning of treatment and after 6 weeks. Patients in the control group showed a significant deterioration regarding disability and handicap, whereas the treated group showed significant improvement. Impairment measures, however, did not change.

The first study which included measurements of quality of life [Short Form 36 Health Survey Questionnaire (SF-36) and Multiple Sclerosis Quality-of-Life questionnaire (MS-QOL-54)] was a non-randomised longitudinal 1 year study, assessing the impact of an outpatient rehabilitation programme in a small patient group (n=12) with a waiting-list control population (n=19)¹⁵. The comprehensive treatment included daily physiotherapy, occupational and recreational therapy and information and help in coping with disabilities and social handicap. After 1 year significant improvement in physical health, pain, energy and fatigue, social support, cognitive ability, and general health were noticed in the treated group despite a decline in functional status. In a further prospective randomised, controlled study evaluating the impact of rehabilitation on quality of life, the effects of intensive inpatient physiotherapy (3 week duration, 2 x 45 min./day) in ambulatory MS patients (N=27) compared to a control group (N=23), which were instructed for a home programme¹⁰, was assessed. After 3 and 9 weeks respectively a significant improvement of disability and mental quality of life as measured by the SF-36 was demonstrated, whereas there was no improvement on the physical composite score. After 12 weeks no significant difference could be noticed. On the functional level both groups were unchanged. An earlier similar study with lower duration and intensity of therapy could not find any significant improvement of mobility after inpatient physiotherapy¹⁶. In an MS group with chronic progressive disease (N=67), inpatient rehabilitation over 3 weeks led to a significant reduction of disability as compared to outpatient treatment¹⁷. This effect of therapy was demonstrated as well after 3 months, but after 12 months, no

significant difference was demonstrated¹⁸. In a prospective, uncontrolled study, 50 MS patients with chronic progressive disease were investigated every 3 months after inpatient rehabilitation (23 days duration) and a significant reduction of disability and handicap was observed over 6 months¹⁹. In this study quality of life assessed by the SF-36 was improved in the physical score for 9 months and in the mental score for 12 months. These findings are particularly important because over the same period an increasing deterioration on functional level was observed demonstrating continuous progression of disease.

The comprehensive rehabilitation of MS patients with restoration of function seems not to be the main reason for improvement. Amelioration is mostly related to increased compensation, adaptation and reconditioning. Furthermore nonspecific effects (emotional coping, self estimation) are important. Information and instruction of patients and the use of medical and social resources may also contribute to improved coping with the disease and disability and therefore an improved quality of life of patients and their relatives. Thus, the specific effect of various therapy modalities is only one aspect of the long term effects observed in rehabilitation.

Specific therapy modalities

Fuller *et al.* were not able to demonstrate improvement on mobility after inpatient physiotherapy¹⁶. The same group examined the effect of outpatient physiotherapy in a prospective controlled cross-over study of 40 MS patients, randomised over 8 weeks, either in a specialised rehabilitation setting, at home or without any therapy at all. A significant improvement of mobility and reduction of disability could be demonstrated during therapy phases in comparison to phases without therapy. Furthermore the frequency of falls could be reduced. This effect was of short duration and could not be demonstrated after 8 weeks. No significant difference was shown concerning therapeutic effects of an outpatient treatment in the clinic and treatment at home¹¹.

A randomised controlled study (N=54) on the effect of aerobic training (3 times per week over 15 weeks) showed a significant improvement of aerobic capacity and of isometric strength compared to a control group²⁰. Furthermore transient improvement of psycho-mental factors (anxiety, depression) and of fatigue could be observed in this study. More recently it has been demonstrated convincingly that a short term exercise training programme had positive effects on aerobic fitness, fatigue, health perception and activity level of subjects with multiple sclerosis²¹.

Concluding remarks

According to criteria of evidence-based medicine none of the studies cited above will reach a Level-I-Evidence (large randomised study with high statistical power). However there is good clinical evidence for the efficacy of rehabilitation in MS¹⁵. An intensive inpatient multidisciplinary rehabilitation programme which is adapted for the individual, can reduce disability and handicap, thus allowing the patients better personal functioning and social participation. Together with better management of specific symptoms and disabilities, the quality of life of MS patients may be improved despite progression of disease. This improvement, especially concerning quality of life overlasts the specific treatment period for up to 6–9 months. Physiotherapy alone (inpatient or outpatient) as well as other specific therapy modalities may lead to improvement of mobility and reduction of disability but the effects are often relatively short-lived. The main reason for the long-term effect is most probably due to improved compensation, adaptation and reconditioning and better use of personal and social resources. Functional restoration seems to play a less important role as rehabilitation measures have no direct influence on the ongoing disease process and on the progression of the disease.

Several questions, however, remain. The optimal time, intensity, duration and specific components of therapeutic interventions in different MS patient groups are still to be determined. Concerning quality of life, controversies exist about whether generic assessment scales of health status are applicable in MS or whether more disease specific measures should be used.

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