Exercise and rheumatoid arthritis: A low-cost intervention with major benefits


SUMMARY
The outcome of patients with rheumatoid arthritis (RA) has improved over the past two decades, with the introduction of newer disease-modifying drugs (DMARDs) and biological compounds. However, an important proportion of patients have disability and some develop deformities. A major reason for this disability is the decline in hand function. Hence, the investigators hypothesized that addition of hand exercises may improve the outcome of patients with RA, through enhancement of hand function.

The Strengthening and Stretching for Rheumatoid Arthritis of the Hand Trial (SARAH) tested the clinical utility and cost-effectiveness of addition of individually tailored exercise programme for hands and arms to the usual care, in a pragmatic, investigator-blind, parallel-group, randomized controlled trial done at 17 hospitals belonging to the National Health Service in England. A total of 1606 patients satisfying the 1987 American College of Rheumatology criteria for RA,1 who were either not receiving a DMARD or receiving a stable dose of DMARD for the past 3 months, were screened. Finally, 490 patients were randomized into two groups: the usual care group and the exercise group.

The usual care group received education in joint protection, general exercise advice and functional splinting, if indicated. The exercise group was prescribed, in addition, exercises to be done at home for 12 weeks; these included seven mobility exercises and four endurance exercises of moderate to somewhat hard intensity, taught by physiotherapists or occupational therapists during six face-to-face contact sessions. Adherence was promoted by exercise contract, diary, patient-led goal-setting and daily review of goals. Follow-up data were obtained at 4 (228 patients in the usual care group and 224 in the exercise group) and 12 (222 and 216 patients, respectively) months after randomization. The primary outcome measure was the overall hand function subscale of the Michigan Hand Outcome Questionnaire (MHQ)\(^2\) at 12 months; secondary outcomes included other subscales of MHQ, namely activities of daily living, pain, work performance, satisfaction and aesthetics, and the summed MHQ score.

The median disease duration at the start of treatment was 10 years in both the groups and >90% patients were receiving biological or non-biological DMARDs. Only 8% of patients received other drugs such as analgesics or mild opiates. The exercise group’s improvement in overall hand function was 7.9 points (95% CI 6.0–9.9), which was more than double of that observed in the usual care group (3.6 points [1.5–5.7]). The secondary outcome measures also showed significant differences in MHQ of activities of daily living, work and satisfaction subscales and MHQ summed score. The participants’ global rating about their hands, wrists or both were improved in the exercise group at both 4 and 12 months. A larger proportion (81%) of participants in the exercise group reported benefit than those in the usual care group (63%). The exercise group also had a greater satisfaction with treatment, and a greater improvement in hand muscle strength and dexterity at 12 months. However, there was no difference between the two groups in erythrocyte sedimentation rate, levels of C-reactive protein, or deformities of metacarpophalangeal joints. There were 103 reports of serious adverse events but none were regarded as related to treatment.

The estimated difference in mean quality-adjusted life-years (QALYs) accrued over 12 months was 0.01 greater (–0.03–0.05) in the exercise group. The cost of the intervention was £156 per patient. The intervention had an incremental cost-efficacy of £17 941 per QALY, which favoured the introduction of this intervention with the UK willingness to pay threshold of £30 000 per QALY.

To conclude, this study showed that a patient-tailored hand exercise programme is a low-cost and effective intervention when administered as an adjunct to various drug regimens in patients with RA, and helped restore and retain the function of hands during a 12-month follow-up period.

COMMENT
RA is the second commonest rheumatic disease after osteoarthritis. Though it can affect adults at any age, it is more common during the 3rd to 5th decades of life. The disease adversely impacts affected persons in several ways: pain, functional disability, deformity, poor physical and social quality-of-life and increased mortality. The optimal management of RA includes effective control of disease activity, maintenance of physical function and improved quality-of-life.

Lack of exercise can also impact disease activity. Physical inactivity due to pain or disability leads to accumulation of fat, which in turn results in increased production of adipokines, which further perpetuate inflammation. Exercise is a non-pharmacological intervention that can enhance the effect of drugs as shown in this study. Recently, exercise has been shown to stimulate secretion of ‘myokines’ by muscles which have anti-inflammatory properties and help decrease disease activity. Further, exercises reduce body fat and decrease adipokine production.

Physical exercise can be done either to improve overall body muscle mass and cardiac functions by running, swimming, jogging, etc. or it can be joint-specific, such as stretching exercises of the hands or quadriceps exercises for hip muscles. Exercise can also vary in its intensity as well as in the number of repetitions done. In patients with RA, exercises such as land-based aerobic exercises or conditioning exercises have been shown to reduce pain and fatigue and to improve the patient’s overall health status.\(^3\) By breaking the vicious cycle of inactivity and weight gain, exercise uplifts the mood and also alleviates depressive symptoms.\(^4\) However, patients with RA seldom undertake such exhaustive exercises, because of pain and deformities.

Local joint-specific exercises are more often feasible in patients with RA. Such exercises involve activities around a specific joint, aimed at improving the symptoms and disability related to that...
particular joint. These exercises include resistance and/or active range-of-motion exercises. Most exercise programmes do not lead to an exacerbation of pain and some have even reported reduction in hand pain.7 Similarly, exercises do not increase the disease activity,9 rather, some studies have shown improvement in disease activity scores.9 Use of hand exercises has shown improvement in grip strength and pinch strength, leading to an improvement in the quality-of-life scores10,11 since these functions are used in almost one-fifth of our routine activities.12 However, though the exercises do improve grip strength, their effect on the range of motion and muscle mass is minimal at best.

The results of this study provide additional support for hand exercises. Further, it proves that these are useful even in patients with long-standing disease and in those with deformities. Patients in the exercise group showed almost double the improvement than that in the usual care group. These results are thus applicable to our patients who present late to hospitals and some of whom have already developed deformities.

The study has limitations that may impact its utility in general practice. Nearly half the patients even though eligible refused further eligibility checks suggesting that patients did not find it a good option probably related to the hospital visits. The other is the lack of representation of different ethnic groups in the study population.

Despite there being enough literature on the utility of exercise programmes and the felt need for exercises among patients with RA, most patients with RA do not do optimal exercises. The most important reason is lack of motivation because of pain and fatigue. Also, they receive conflicting advice from their physicians on what is appropriate exercise for them.13

Since this study was done in developed countries, it may be relevant to ask whether its results apply to Indian patients with RA. Patients in India face several additional barriers such as lack of education, limited access to healthcare and high cost of physiotherapy programmes. Most district-level hospitals in India do not have a physiotherapist. Hence, patients would have to travel long distances for a supervised exercise programme, such as the one this study included. Affordability is another issue as 80% of medical costs are met from out-of-pocket expenses. Last but not least is the short time spent by a physician with the patient during a medical consultation with no time to explain specific exercises. The physician needs to motivate patients by explaining the cost-effectiveness and simplicity of the exercises. Many exercises can be done at home without any special equipment. As there is no risk of disease exacerbation, exercises can be done without much supervision. Indians have a higher risk of diabetes and coronary artery disease, which is further increased in patients with RA due to the use of drugs such as corticosteroids, obesity due to lack of activity and continued inflammation. Thus, it is imperative to include a basic exercise programme supplemented by a supervised programme for patients in India.

In conclusion, hand exercises improve muscle strength but the other beneficial effects of exercises in RA are still being studied. This area is worth exploring because it is low cost and has the potential of having widespread physical and psychological effects. The most apt question at present is: if intervened early in the course of the disease, can exercises prevent deformities? Till such time that we have more effective and cheaper treatments available for our patients, exercise holds promise in optimizing the response to treatment without any significant increase in the cost of healthcare.

REFERENCES

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