**Exercises to improve function of the rheumatoid hand (SARAH): a randomised controlled trial**

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**Summary**

**Background**

Disease-modifying biological agents and other drug regimens have substantially improved control of disease activity and joint damage in people with rheumatoid arthritis of the hand. However, commensurate changes in function and quality of life are not always noted. Tailored hand exercises might provide additional improvements, but evidence is lacking. We estimated the effectiveness and cost-effectiveness of tailored hand exercises in addition to usual care during 12 months.

**Methods**

In this pragmatic, multicentre, parallel-group trial, at 17 National Health Service sites across the UK we randomly assigned 490 adults with rheumatoid arthritis who had pain and dysfunction of the hands and had been on a stable drug regimen for at least 3 months, to either usual care or usual care plus a tailored strengthening and stretching hand exercise programme. Participants were randomly assigned with stratification by centre. Allocation was computer generated and unmasked to participants and therapists delivering treatment after randomisation. Outcome assessors and all investigators were masked to allocation. Physiotherapists or occupational therapists gave the treatments. The primary outcome was the Michigan Hand Outcomes Questionnaire overall hand function score at 12 months. The analysis was by intention to treat. We calculated cost per quality-adjusted life-year. This trial is registered as ISRCTN 89936343.

**Findings**

Between Oct 5, 2009, and May 10, 2011, we screened 1606 people, of whom 490 were randomly assigned to usual care (n=244) or tailored exercises (n=246). 438 of 490 participants (89%) provided 12 month follow-up data. Improvements in overall hand function were 3·6 points (95% CI 1·5—5·7) in the usual care group and 7·9 points (6·0—9·9) in the exercise group (mean difference between groups 4·3, 95% CI 1·5—7·1; p=0·0028). Pain, drug regimens, and health-care resource use were stable for 12 months, with no difference between the groups. No serious adverse events associated with the treatment were recorded. The cost of tailored hand exercise was £156 per person; cost per quality-adjusted life-year was £9549 with the EQ-5D (£17 941 with imputation for missing data).

**Interpretation**

We have shown that a tailored hand exercise programme is a worthwhile, low-cost intervention to provide as an adjunct to various drug regimens. Maximisation of the benefits of biological and DMARD regimens in terms of function, disability, and health-related quality of life should be an important treatment aim.

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