Work disability in an inception cohort of patients with seropositive rheumatoid arthritis: a 20 year study

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Abstract

Objective. Information from successive inception cohorts is needed to monitor the long-term prognosis of rheumatoid arthritis (RA) and the effect of treatment on it. We studied work disability and its association with the Health Assessment Questionnaire (HAQ) index and the Larsen score of radiographic damage.

Methods. Work disability was recorded at onset and at 1, 3, 8, 15 and 20 yr from entry among 103 patients with recent-onset (<6 months) seropositive RA.

Results. Work disability due to RA was already 31% [95% confidence interval (CI) 21–40] after 1 yr among patients of working age. It increased gradually and the cumulative rate reached 80% (95% CI 70–89) by the 20 yr check-up. The mean HAQ index was 0.96 at the 20 yr check-up and the mean Larsen score 45% of the maximum value.

Conclusion. The data serve as a basis of comparison for later cohort studies.

KEY WORDS: Rheumatoid arthritis, Work disability, HAQ index, Larsen score, Follow-up study.

Rheumatoid factor (RF)-positive rheumatoid arthritis (RA) is in most instances a chronic progressive disease. Continuous rheumatoid inflammation causes destruction of the joints. Work disability has serious social and economic consequences both for society and the individual; obviously, active inflammation and joint destruction are the most important determinants of loss of employment.

In order to monitor the long-term prognosis of RA and the effect of treatment on it, information from successive inception cohorts is needed, whereby outcome measures can be compared. A prospective population-based study covering patients with various forms of recent-onset arthritis from a defined area, called the Heinola Follow-up Survey of Arthritis, was initiated in 1973 [1, 2]. Follow-up of RA patients in this cohort has now continued for 20 yr. We report here on work disability in RA patients belonging to this cohort.

Patients and methods

As part of the Heinola Follow-up Survey of Arthritis, a total of 121 patients with recent-onset (<6 months) RA were studied during 1973–1975 at the Rheumatism Foundation Hospital in Heinola, Finland. Viewed in retrospect, they met the 1987 American College of Rheumatology (ACR) classification criteria for RA [3].

The selection criteria, data collection strategy and details of the patients have been documented earlier [4–6]. After onset, eight patients had died, seven were lost to follow-up and three remained RF negative. The remaining 103 (33 men and 70 women) patients with RF-positive RA seen by KK at their 8 yr check-up were subjects of the study described here. All but one of the patients had developed erosions during the 20 yr follow-up [5].

At onset, the age range was from 17 to 70 yr (mean 45 yr). The follow-up examinations of the final group took place at onset and at 1, 3, 8, 15 and 20 yr from entry. A total of 83 patients attended the 15 yr follow-up and 66 attended the 20 yr follow-up during 1995–96, while 30 patients had died and seven did not participate because of other diseases. The disease-modifying anti-rheumatic drugs (DMARDs) used during the first 8 yr were in most cases aurothiomalate and/or chloroquine [4].

Radiographs of hands and feet in dorsovolar projection were taken at each check-up. Destruction was graded by the Larsen method [7]. The grades for the I–V metacarpophalangeal joints and wrists and II–V metatarsophalangeal joints (20 joints) were added to form a Larsen score of 0–100 [6].

Disability was assessed at the 20 yr check-up by the Health Assessment Questionnaire (HAQ) index [8]. The highest score for each of eight areas of activity in daily living was summed (range 0–24) and divided by eight to yield a continuous scale (0–3) of functional disability index.
Patients were considered to be unable to work due to RA if they had retired on a disability pension under the National Pensions Act available to the entire population of working age (16–64 yr). People with a work history are additionally insured under the employment pensions system. The disability pension is payable to persons who are incapable of work, i.e. unable to do their usual work, or any kind of work, which given their age, occupation and similar circumstances, would be suitable for them.

Analysis of the development of work disability was carried out according to the life table method. Spearman’s non-parametric correlations were counted for correlations between HAQ index, Larsen score and age of the patient. Logistic regression analysis was used to explain retirement due to RA.

Results

Of the patients of working age, 31% [95% confidence interval (CI) 21–40] had already stopped working due to RA 1 yr after the onset of the disease (Fig. 1). The cumulative work disability rate gradually increased and by the 20 yr evaluation had reached 80% (95% CI 70–89).

Table 1 shows the mean HAQ indices and Larsen scores recorded at the 20 yr check-up among subjects continuing work and those who had retired because of RA, other disease or age. The mean HAQ index was lowest among those still at work, whereas no appreciable difference was found between the other three groups. The mean Larsen scores were highest among those who had retired because of RA or age and lowest among those who had retired because of some other disease.

Figure 2 illustrates the distribution of HAQ indices and that of Larsen scores in different work capacity groups. Three out of the 15 subjects still working had an HAQ index slightly above the median. The corresponding figure in the case of Larsen scores was four. In three patients, however, the score was quite high.

The HAQ index showed a correlation both with the Larsen score and with age. The age-adjusted correlation coefficient between the HAQ index and Larsen score was 0.46.

Finally, a logistic regression analysis was used to explain retirement because of RA using the 20 yr HAQ index and Larsen score simultaneously in the model. The odds ratio with its 95% CI was 1.13 (1.02–1.27) for the HAQ index and 1.01 (0.95–1.04) for the Larsen score.

Discussion

A number of recent cohort studies of RA have still relied upon the ACR 1958 criteria [9]. There are, however, problems of specificity in the diagnosis of definite RA by these criteria. The diagnostic focus in our patient series was therefore sharpened by excluding

![Fig. 1. Cumulative retirement because of rheumatoid arthritis in 103 subjects during 20 yr.](image)

![Fig. 2. Distribution of Larsen scores and HAQ indices in different work capacity groups among 66 RA patients at the 20 yr check-up. ○, women; ●, men. The dotted line denotes the median.](image)

Table 1. Larsen scores and HAQ indices in different work capacity groups among 66 RA patients participating in the 20 yr check-up

<table>
<thead>
<tr>
<th>Work capacity</th>
<th>Number of patients</th>
<th>HAQ index mean (95% CI)</th>
<th>Larsen score mean (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working</td>
<td>15</td>
<td>0.3 (0.1–0.6)</td>
<td>33 (16–50)</td>
</tr>
<tr>
<td>Retired because of RA</td>
<td>42</td>
<td>1.2 (0.9–1.4)</td>
<td>50 (42–59)</td>
</tr>
<tr>
<td>Retired because of another disease</td>
<td>4</td>
<td>1.0 (–)</td>
<td>23 (–)</td>
</tr>
<tr>
<td>Retired because of age</td>
<td>5</td>
<td>1.0 (–)</td>
<td>50 (–)</td>
</tr>
<tr>
<td>All patients</td>
<td>66</td>
<td>1.0 (0.8–1.2)</td>
<td>45 (38–52)</td>
</tr>
</tbody>
</table>

*The confidence interval was not computed because of the small number of cases.
at a later phase 10 atypical cases [5]. The final series consisted of 103 RF-positive patients, of whom all but one had erosive disease; details of the joint destruction have been published elsewhere [6, 10].

As far as we are aware, the 3 yr check-up in the Heinola Follow-up Survey was the first study to draw attention to the loss of ability to work in the early phase of RA [2]. Work disability was dealt with in greater detail in the context of the 8 yr check-up [11]. Several studies of recent-onset RA carried out in Central and Northern Europe during the last few years, covering a period up to 3–8 yr from disease onset, have confirmed our findings [12–15]; about one-third of RA cases of working age were already on disability pension after 3 yr from the onset of the disease. Many had stopped working in the first year after onset. The most important predictors for work disability were high disease activity, low educational level and age > 50 yr.

There are only a few work disability studies covering a period of 15 yr or more [16–18]; one of these, albeit only for a small part involving an inception cohort, was prospective [18]. In a cross-sectional study from Finland [16], 67% of the patients were on disability pension after 15 yr. According to a 1987 study by Yelin et al. [17] from the USA, 60% of RA patients with some work experience had given up work within 15 yr from diagnosis and as many as 90% within 30 yr. A recent prospective study from the USA [18] reported somewhat lower figures; work disability was estimated to occur in 50% at 21 yr after disease onset. In this context, it has to be taken into account that work disability rates may be influenced by differences between the social security systems in Central and Northern Europe compared to American and other societies, as well as by the employment rates and other characteristics of the labour market [13].

In the present series, the 20 yr cumulative rate of work disability due to RA was 80%. As mentioned above, work disability is dependent on educational level (and on profession). Since World War II, a profound change has taken place in Finland: from an agricultural to a post-industrialized society. Accordingly, work disability may not be a particularly good yardstick for monitoring disease outcome in successive patient cohorts.

The mean HAQ index in our patient series was 0.96 and the mean Larsen score 45% of the maximum value. For the sake of comparison, it may be mentioned that in a population-based series of RA patients from Northern Finland satisfying the 1987 ACR criteria and with a mean 16 yr duration of disease, the corresponding figures were 0.86 and 40% [19]. In the present series, the HAQ index was significantly associated with work disability when the Larsen score had been taken into account in multiple regression analysis; vice versa, no independent role remained for the Larsen score. Indeed, one patient was still continuing work as a housewife in spite of a maximum score.

In early studies, some 10% of RA patients were confined to a chair or bed 10–15 yr after the onset of the disease [20, 21]. Most of the subsequent improvement can probably be ascribed to the advent of total joint replacement surgery. Some recent data, however, indicate that the long-term use of DMARDs retards the progression of destructive joint disease [22] and retains functional ability in RA patients [23]. Likewise, the prevalence of secondary (reactive) amyloidosis complicating RA has apparently declined [24].

The present findings suggest that the Larsen score and the HAQ index are simple measures which could well complement each other in outcome studies of RA.

References