

EXTENDED REPORTS

Work disability in early rheumatoid arthritis

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Abstract

Objective—To assess the impact of early rheumatoid arthritis (RA) on work status.

Methods—The employment status of 119 patients who had jobs before the onset of RA was examined. Patients with work disability were compared with those without, for several disease characteristics, therapeutic regimen, and educational level and age.

Results—Sixty two percent of the patients, particularly manual workers, reported some kind of work disability (7% worked less, 13% were on sick leave, and 42% had quit their jobs). Forty five patients (38%) stated that they were working without any restrictions; however, only 12 of this latter group (10% of the total group) had not encountered any changes at all within their jobs. The patients who reported work disability had a lower level of education and scored higher for several disease characteristics (erythrocyte sedimentation rate (ESR), joint tenderness, Health Assessment Questionnaire (HAQ), and Groningen Activity Restriction Scale) and were provided with more medication compared with patients without work disability, though only the educational level, disease duration, HAQ and ESR contributed significantly to work disability in logistic regression analysis.

Conclusion—Even at an early stage, RA has a considerable impact on work status. This study indicates that work disability is dependent on disease characteristics and on the educational level of the patient.

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Rheumatoid arthritis (RA) is a chronic-progressive disease of the autoimmune system. The disease has an unpredictable course, with no general pattern and an uncertain rate of deterioration.¹⁻⁴ In most cases patients become more or less disabled and this occurs rather early on in the course of the disease.^{5,6} Bodily functions become disturbed, which may result in impairment (physical incapacity). In turn, impairment may lead to disability, for example, restrictions in performing activities, tasks, and behaviours. When disability has a social effect or disadvantage, one speaks of handicap.^{7,8} This implies that, besides the consequences of the disease for the body, RA has other consequences in terms of behavioural restrictions and changes⁹⁻¹¹ which should be distinguished from those of the disease itself.¹²

RA is thus a disease that fits the model formulated in the International Classification of Impairments, Disabilities and Handicaps (ICIDH)¹³ and 'the disablement process' as described by Verbrugge and Jette.¹⁴ Another model related to the course of the disease focuses on how a chronic illness (eg RA) can disturb the patient's way of life by interfering 'with continued involvements in valued activities and interests'. These illness induced disruptions of lifestyle constitute the *illness intrusiveness* of a (chronic) disease.¹⁵

Each model not only attempts to describe the pathways from pathology to various behavioural outcomes, but also describes how the main pathway does not occur in a strictly uniform and causal-deterministic way. Socio-demographic, psychosocial, health care and (other) environmental factors may influence this pathway,^{7,12,14} but whichever model is chosen for studying the impact of RA, the result of the process described by each is that, ultimately, social roles become disturbed.

According to social role theory, every human being is involved in many social roles in life, for example age roles, family roles, or occupational roles.¹⁶ The impact of a chronic disease on social roles depends on both the *type* of social role and the *flexibility* of that role. The impact may vary from no influence at all to major role changes, or even loss of a certain role (eg occupation). Social roles differ as to their degree of flexibility. Flexibility is defined as the 'capacity to change'.¹⁷ This may also be the case within the same category of social roles; for example, in certain jobs it will be easier to remain employed than in other jobs.

Occupational roles fulfil an important function in daily life. They are associated with social position, income, and social status in addition to a person's identity. Changes in the ability to perform one's occupation can lead to a great loss of earning power, to psychological stress, and to changes in identity.¹⁶⁻²⁰

Several studies have demonstrated the consequences of RA for the performance of the occupational role. At the time of study, 50-60% of patients had stopped working after a mean disease duration of about 10 years;²¹⁻²⁴ the mean age in these four studies was comparable: about 52 years.

However, what was not clear from these studies was if the reason for giving up work was a direct result of the rheumatism in *all* cases. In this respect, two studies—one based on data from the 1970-87 National Health Interview Survey²⁵ and the other on the 1978 Social Security Survey of Disability and Work²⁰—

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demonstrated that labour force participation among men with arthritis was 20–33% lower than among men without arthritis, and 25–31% lower among women with arthritis than among women without. This reduction in labour force participation was substantially lower than that mentioned in the previous studies.

In a group of recently diagnosed RA patients one would expect that loss of labour would not yet be predominant. However, it has been demonstrated that the impact of RA on clinical and health status for a group with RA disease duration less than one year was similar in magnitude to that in a group with more established disease (mean disease duration eight years).⁵ As clinical and health status are related to physical functional ability, this could point to a substantial loss of work in recently diagnosed RA patients. As a result, it is not clear what the impact of early RA will be on employment status.

In this study, we investigated the work disability of recently diagnosed patients with RA, and examined if it may be attributed to the RA. In addition, the nature of the patient's employment was examined with respect to work disability. The study also focused on how work disability (patients had quit their jobs, were on sick leave, or had worked less, as a result of RA) was related to several disease characteristics, and to age and educational level (compared with the patients who were fully employed). As a final step, the relevance of these separate variables was tested in a multivariate model by means of a logistic regression analysis.

Patients and methods

As part of the EURIDISS project (EUropean Research on Incapacitating Diseases and Social Support),²⁶ patients were selected who presented symptoms corresponding to or suspected as being caused by RA. Further requirements for selection were that the patient lived in the northern region of the Netherlands and had a disease duration of four years or less. The rheumatologist assessed the disease duration and whether the selected patients fulfilled at least four of the seven American Rheumatism Association (ARA) criteria.²⁷ This first screening provided 366 patients. Thirty five patients were excluded for reasons which included: having moved out of the region, other interfering (chronic) diseases, or having a disease duration of five years or more; patients who could be classified as at stage 4 of Steinbrocker's functional classes were also excluded.²⁸ Thirty nine patients (12%) refused to participate for several reasons. The final sample comprised 292 patients: 187 women (64%) and 105 men (36%). The mean age of the patients was 54 (SD 12) years (range 21–71); 78% indicated that they were married; mean disease duration was 1.8 (SD 0.8) years.

Data were collected by means of a two hour interview at the respondent's home. Several psychosocial and demographic characteristics were registered. Questions were also asked about the respondent's present or last occupation. If

the respondent had no job, information was gathered about the year the respondent stopped working, and whether this was caused by the RA.

ASSESSMENT OF DISEASE CHARACTERISTICS

Disease duration was measured as the time passed since the fulfilment of the fourth ARA criterion. The respondents were also asked how long ago their first rheumatic symptom appeared (*time since first symptom*). Disease activity was assessed by means of the erythrocyte sedimentation rate (ESR).

The *Ritchie articular index* was used as a clinical measure of disease activity.²⁹ Firm pressure was exerted on 24 joints and scores were assigned for each according to Ritchie: 0 = no tenderness; 1 = patient complains of pain; 2 = patient complains of pain and winces; 3 = patient complains of pain, winces, and withdraws. The Ritchie score was the total scores from the 24 joints (possible range 0–72).

Patients were also rated according to *Steinbrocker's functional classes*, to assess functional impairment. This index consists of four classes: 1 = complete functional capacity with ability to perform all usual duties without handicap; 2 = functional capacity adequate to conduct normal activities despite handicap or discomfort or limited mobility of one or more joints; 3 = functional capacity adequate to perform only few or none of the duties of usual occupation or of self-care; 4 = largely or wholly incapacitated with patient bedridden or confined to wheelchair, capable of little or no self-care.²⁸ In this study, Steinbrocker class 4 was an exclusion criterion.

FUNCTIONAL STATUS ASSESSMENT

The *Health Assessment Questionnaire* (HAQ)³⁰ has frequently been used as a self report questionnaire in research among patients with RA. It contains 20 items (graded 0 = without any difficulty; 1 = with some difficulty; 2 = with much difficulty or with some help from another person or with a device; 3 = unable to do) distributed over eight components, all reflecting activities of daily living; a score is calculated as the average of the eight scores obtained for components 'dressing and grooming', 'arising', 'eating', 'walking', 'hygiene', 'reaching', 'gripping' and 'activities'. The range of the HAQ score is therefore also 0–3.

The *Groningen Activity Restriction Scale* (GARS)³¹ was administered by the interviewer, and counts 18 items from two subscales: activities of daily living (ADL) (dressing, washing oneself, etc.) and instrumental activities of daily living (IADL) (mainly household activities). The response categories of the GARS are: I can perform the activity ... 1 = fully independently without any difficulty; 2 = fully independently but with some difficulty; 3 = fully independently but with great difficulty; 4 = not fully independently (I can do it only with someone's help or I need complete help). A total scale score is obtained by adding up all item scores (possible range 18–72): the higher the score, the more activity restrictions.

MEDICAL TREATMENT

Information was obtained from the rheumatologists concerning the therapeutic regimen of the patients, including surgical treatment (in most cases synovectomy), whether or not the patients were taking medicines, and the nature of any medicine taken (non-steroidal anti-inflammatory drugs (NSAID), corticosteroids, disease modifying drugs, or intra-articular injections).

OTHER ASSESSMENTS

Educational level was registered according to the International Standard Classification of Education (ISCED),³² but was reduced to six categories (from 1 = low to 6 = high). The main (major) levels that are distinguished in the Netherlands Central Bureau of Statistics (CBS) classification of occupations³³ were used to classify the *occupational level* of the patient as follows: 1 = non-manual workers (professional and technical workers; administrative and managerial workers; clerical workers); 2 = sales and service workers; 3 = manual workers (agricultural workers; production workers, transport equipment operators and labourers; military personnel).

Finally, if the respondents had left their employment, they were asked how long ago this had happened. The time elapsed was the *time since quitting job*. Respondents who reported that they had a job were asked if any major or minor changes in their jobs had occurred as a result of their rheumatism. Major changes were, for example, working fewer hours or sometimes staying home from work, while minor changes were, for example, taking more rest periods at work or working more slowly.

PROCEDURE

To assess the impact of RA on the occupational role, it was necessary to identify first those patients who had a paid job before RA became apparent. Therefore patients who were retired (who had an age of 65 or more), who were studying, who indicated that they were a homemaker, and those who indicated that they were unemployed or disabled for reasons other than RA, were excluded from the total sample. For the remainder, the extent of work disability as a result of RA was assessed, and the nature of the previous employment was investigated.

Next, patients with RA related work disability were compared with those without RA related work disability according to sociodemographic variables (age, sex and educational level), disease characteristics (disease duration, disease activity (ESR), joint tenderness (Ritchie index), level of disability (GARS, HAQ) and Steinbrocker's functional classes), and medical treatments (the use of drugs, NSAIDs, corticosteroids, slow acting drugs, intra-articular injections, and surgical treatment). The significance of the differences of means was tested using multiple regression analysis. A significant main effect for *group* (work disability *v* no work disability) indicates

a difference in mean score between the group with work disability and the group without work disability. In addition, a *group-by-sex* interaction term was tested, in order to explore if the difference between the work disabled males and the non-work-disabled males was similar to that between the work disabled females and the non-work-disabled females.

As a next step to this univariate analysis, a logistic regression analysis was performed to assess the important factors relating to work disability in a multivariate context. With a stepwise procedure, all available variables on medical treatment and disease characteristics were admitted to the model, after sex, age, and education had been entered in the first step.

As a final part of this study, we examined if respondents who were (still) able to perform their work had encountered major or minor changes within their jobs.

Results

EFFECT OF RA ON WORK STATUS

First, we assessed which part of the total sample of 292 respondents had had a paid job before the onset of RA. On entering the study, 67 patients had reached the age of retirement, while another 11 patients had retired before the age of 65. Two respondents were still studying and had not entered the labour market yet. Five patients indicated that they were unemployed and eight were disabled for reasons other than RA, such as mental problems, back complaints, hip complaints or hernia. Nine patients were no longer working, for unknown reasons, and 71 respondents belonged to the category 'homemaker'. Therefore, in total 119 respondents had a paid job before the onset of their rheumatism: 58 men and 61 women. At the time of the study they had a mean age of 48 (SD 10) years and a mean disease duration of 1.8 (SD 1.2) years. (Corrected for the fact that the total sample consisted of 36% males and 64% females, the proportion of males/females of the labour force in this sample is: (patients with a paid job + those who are unemployed; 60 males and 64 females) = 167/100 (1.67). This proportion for the total Dutch labour force was 4211/2622 (1.61) for 1989.³⁴ This figure indicates that the labour force proportion males/females in the present sample was representative.)

Table 1 presents the work status at the time of the interview, for patients who had a paid job before the onset of RA. Also indicated is whether a change in work status was caused as a result of RA. Forty per cent of this group

Table 1 Employment status of 119 respondents representative of the labour force, and effect of RA on employment status

Employment status	Men		Women	
	No	%	No	%
1. Working	19	32.8	26	42.6
2. Working less, due to RA	8	13.8	1	1.6
3. On sick leave, due to RA	6	10.3	9	14.8
4. Quit job, due to RA	25	43.1	25	41.0
Total	58	100	61	100

(19 males and 26 females) were not restricted in their job performance by their rheumatism, whereas approximately 40% of the patients (25 women and 25 men) had quit work completely because of RA. Furthermore, about 20% of the men and women reported that they were either working less (eight men and one woman) or were on sick leave (nine women and six men) as a result of their RA. In all, 67% of the men and 57% of the women reported that they were no longer capable of performing their former normal occupational activities because of RA.

Looking at the nature of the patients' jobs, 60% of the group with no work disability had a non-manual job, 20% were sales and service workers, and 20% were manual workers. Of the patients with work disability, 16% were non-manual workers, 34% were sales and service workers, and 50% belonged to the manual workers category.

DIFFERENCES IN SOCIODEMOGRAPHIC AND DISEASE CHARACTERISTICS AND IN MEDICAL TREATMENT

Patients who perceived no work disability were compared with those who did. To this end, two groups were composed. One group comprised 74 respondents (35 women and 39 men) for whom RA had led to a change in work status, because they had left their employment, were on sick leave, or worked less. The other group comprised 45 patients (26 women and 19 men) for whom RA had no effect on the work status.

Table 2 shows the differences in socio-demographic and disease characteristics, and in therapeutic regimen, between the two groups. With respect to age, a significant difference was found between patients still at work and the other group. In addition, a significant sex-by-group interaction term was found ($p = 0.014$); however, when this term was inserted into the

equation, the main effect (for group) was no longer significant. We may conclude, therefore, that the difference between the group that is work disabled and the other group was attributable solely to the women in the working group who are younger; for men there was no difference between the two groups. Importantly, the educational level of the patients at work was significantly higher than those who had to stop. This implies that patients with a lower level of education are more liable to be work disabled.

From the second part of table 2, it appears that there was no difference between the working/not working groups with respect to disease duration. Although no main effect (for group) was found, the sex-by-group interaction term was significant ($p = 0.039$), indicating that women who were able to work had a longer disease duration than women with work disability. Regarding the time elapsed since the first symptom of RA had appeared, no differences were found. The patients who had quit their jobs had done so, on average, about 36 months earlier.

Results for the more disease specific characteristics were also unequivocal. The patients who were not working because of their rheumatism had a significantly higher disease activity as measured by ESR, and had higher scores on Steinbrocker's functional classes, Ritchie index, HAQ, and GARS. In addition to a significant main effect, a significant sex-by-group interaction term ($p = 0.001$) was found with respect to HAQ score. It appeared that the difference between the group with work disability and the group without work disability was different for men and women, the latter having higher scores; also, the difference from men was much greater in the group able to work.

The final part of table 2 summarises the results with respect to differences in therapeutic regimen. It can be seen that patients with work disability were receiving more medicines and surgical treatments, though the difference was significant only for patients treated with NSAIDs, and for patients who had surgical treatment.

In the preceding analysis, all variables were analysed separately. In the next analysis, using logistic regression analysis, all variables were analysed together in one analysis, with work disability as the dependent variable (table 3). In the first step the variables age, sex, and educational level were entered. Of these three variables, educational level was the only one that contributed significantly to the model. The odds ratio (Exp(B)) of 3.145 indicates that for every increase of one step in educational level, the risk of work disability decreases 3.145 times. Furthermore, of the disease characteristics only disease duration, HAQ, and ESR contributed significantly to work disability; none of the variables concerning medical treatment reinforced the model. The variables shown in table 3 were able to classify 80.9% of the patients correctly with regard to their work status. The explained variance of the model was 43%.

Table 2 Univariate analysis of the mean scores on educational level, age, disease characteristics and therapeutic regimen by employment status (not working/working) for men and women ($n = 119$)

	Mean score				†
	Not working		Working		
	Men ($n = 39$)	Women ($n = 35$)	Men ($n = 19$)	Women ($n = 26$)	
Educational level and age					
Age	50.7	48.0	48.7	42.2	0.020
Education	2.92	2.89	3.63	3.85	0.000
Disease characteristics					
Disease duration (yr)	1.58	1.91	1.58	2.15	
Time since 1st symptom (yr)	3.99	4.07	6.34	5.26	
Time since quitting job (yr)	3.12	2.97			
ESR	28.2	32.1	10.8	18.8	0.001
Steinbrocker	2.24	2.26	1.79	1.88	0.000
Ritchie	12.2	12.6	5.1	8.7	0.001
HAQ	1.17	1.45	0.41	0.81	0.000
GARS	35.4	36.7	25.8	27.3	0.000
Therapeutic regimen					
Use of medicines (%)	89.7	91.2	84.2	88.5	
NSAIDs (%)	84.6	79.4	52.6	57.7	0.002
Corticosteroids	23.1	12.1	21.1	11.5	
Mean daily dose (ml)	0.97	0.42	0.37	0.23	
Slow acting drug (%)	71.8	79.4	68.4	61.5	
Intra-articular injections (%)	30.8	35.3	15.8	26.9	
Surgical treatments (%)	12.8	20.6	0.0	7.7	0.05

†Not working v working.

Table 3 Stepwise logistic regression of disease characteristics and therapeutic variables on work disability, taking account of age, sex, and educational level. Only the significant variables are presented

Step	Variable	B	SE	Exp(B)	p
1.	Age	-0.003	0.027	0.997	
	Sex	-0.508	0.292	0.602	
	Educational level	1.146	0.325	3.145	0.000
2.	HAQ	-2.066	0.513	0.127	0.000
3.	Disease duration	0.045	0.022	1.046	0.041
4.	ESR	-0.030	0.015	0.970	0.039
	Constant	-2.466	2.190		

B = Estimated coefficient; SE = standard error; Exp(B) = odds ratio; HAQ = Health Assessment Questionnaire; ESR = erythrocyte sedimentation rate.

EFFECT OF RA ON JOB PERFORMANCE

Table 4 shows changes in job performance for the respondents who were still able to work. Although RA had not led to work disability in this group, it is apparent that in about 75% of both men and women, alterations in job performance had taken place; only 12 patients (10% of the total sample) of the present study encountered no changes at all as a result of RA.

Discussion

This study demonstrates that, even in its early stages, RA has a considerable effect on work status. After a mean disease duration of about two years (range 1–4), 67% of the male patients and 57% of the females reported that they were not able to perform their former normal occupational activities. About 42% of the patients had quit their jobs completely as a result of RA. Forty five patients (19 men and 26 women; 38%) indicated that they were able to perform their occupational roles completely, although 75% of this group did report that they had met minor or major changes within their jobs as a result of RA. Therefore, this study indicates that, in the first four years of the disease, only 10% (12/119) of RA patients remained completely free of any changes with respect to the performance of their occupational roles.

These findings are in agreement with those of earlier studies;^{21–24} however, in this study, the disease duration was four years or less—half of that in the studies reviewed. From our findings it can be concluded that becoming work disabled occurs within only a few years of the onset of the disease: patients who left their jobs had done so on average 36 months before the start of the study. One explanation for this significant result might be that we used the revised 1987 ARA criteria²⁷ for the selection of patients; perhaps these criteria are more strict than those used in the earlier studies.

Table 4 Changes in job performance as a result of RA, in men and women (n = 45)

Changes	Men		Women	
	No	%	No	%
1. Yes	14	74	19	73
2. No	5	26	7	27
Total	19	100	26	100

Educational level is strongly related to the type of job a person performs. Interestingly, the educational level of the patients who did not report any work disability was higher than that of patients who had given up their work: 68% (26/38) of the patients with a non-manual job remained at work, while 80% (37/46) of those with a manual job had left it. It could also be an indication that employment for which a higher educational level is required is often more adaptable, as these jobs usually demand less physical exertion, and highly educated respondents are probably more capable of arranging other working conditions within their jobs. In this respect, Yelin³⁵ stated that '...social and work factors combined had a far larger effect on work disability than all disease factors'³⁵—a view reiterated by others.^{36–37} However, the present study showed very clearly that patients who were unable to perform their normal labour tasks also had higher scores on all disease-specific indices. Without exception, these variables differed significantly between the two groups, which would imply that, in general, the origin of the restrictions in carrying out occupational tasks can be found in the disease-related variables. The HAQ score of the group with work disability was much higher than that of the patients without work disability. Additional analysis demonstrated that this result was not caused by outliers: omission of the 10 most extreme values led to only a small decrease in score.

Although not significant, the time elapsed since the first RA related symptom had appeared was much longer for patients who were still working. This is remarkable, because the disease duration was not different for patients with and those without work disability, and because the distinction in mean scores was in the unexpected direction. However, in this case the difference between the two groups can be ascribed to outliers. When the 10 most extreme values were omitted from the analysis, no difference could be demonstrated between the two groups. The question remains, however, why most of the outliers remain in their employment.

Patients with work disability had also undergone more surgery and were provided with more NSAIDs. Unfortunately, it could not be demonstrated that any medical treatment had a favourable effect on the employment status of the patients. This result is in accordance with the findings of another recent study.²⁴ In view of the fact that those patients who left their jobs used more medicines from the whole range, it is perhaps not surprising to find no positive effect on work status.

While many differences were found between the work disabled and the non-work-disabled patients, only a few variables contributed significantly in the logistic regression analysis, among which was the disease duration. Remarkably, this variable did not differ between the two groups in the univariate analysis. Differences in medical treatment had no effect on remaining at work, according to the logistic regression analysis.

Quality of life of RA patients was not the primary focus of this study. However, because it comprises a physical, a psychological, and a social component,^{38, 39} quality of life of RA patients could be (and probably is) affected by a change in the occupational role. This study has demonstrated that work disability is an even more serious problem than could be concluded from other studies. Efforts should therefore be undertaken to prevent RA patients losing their occupational roles. Rheumatologists could help in this respect by providing their patients with an explanatory letter for the employer, concerning RA and its consequences for the patient. Such communication could help patients to arrange other occupational tasks when it is no longer possible to perform their normal tasks, and encourage employers to retrain the employee whenever possible.

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