

Arthritis and Employment Research: Where Are We? Where Do We Need to Go?

DIANE LACAILLE

ABSTRACT. Studies of work disability among individuals with arthritis reveal that loss of employment is a common, important, and costly problem. Arthritis and musculoskeletal conditions are the leading cause of longterm work disability in Canada and the US, with an estimated yearly cost of \$13.7 billion in Canada. In rheumatoid arthritis, reported rates of work disability are remarkably high, ranging from 32% to 50% 10 years after RA onset, and increasing to 50% to 90% after 30 years. Studies have shown that work disability starts early in the course of RA, emphasizing the need for early intervention. To date, research in the area of arthritis and employment has mostly focused on measuring the extent of the problem and on identifying predictors of work loss. Despite the importance of the problem, there has been little intervention research assessing the effectiveness of medical treatment and few interventions specifically aimed at employment, reducing work loss, or improving ability to work. Research needed includes evaluating the effect of current therapies on employment outcomes, and studying interventions specifically aimed at employment, as well as addressing methodological issues in employment research. (J Rheumatol 2005;32 Suppl 72: 42-45)

Key Indexing Terms:

ARTHRITIS
DISABILITY
OUTCOME ASSESSMENT

EMPLOYMENT
TASK PERFORMANCE AND ANALYSIS
WORK DISABILITY

WORK LOSS FROM INFLAMMATORY ARTHRITIS: AN IMPORTANT PROBLEM

People who live with inflammatory arthritis must deal with pain, stiffness, and fatigue on a daily basis, often with a gradual loss of physical function. It is therefore not surprising that work is a challenge. Studies of work disability (WD) among individuals with arthritis reveal that loss of employment is a common, important, and costly problem. Arthritis and musculoskeletal (MSK) conditions are the leading cause of longterm WD in Canada¹ and the US². In rheumatoid arthritis (RA), the prototypic chronic inflammatory arthritis, reported rates of WD are remarkably high, ranging from 32% to 50% 10 years after RA onset and increasing to 50% to 90% after 30 years³⁻⁹. In a British Columbia study of work disability due to RA, we found that 18% of people had stopped working after 5 years and 27% after 10 years¹⁰. All studies, including ours, that looked at WD rates from RA over time found that work disability starts early in the course of RA⁴⁻¹². Survival in the workforce per time since RA diagnosis shows a rapid and steady decline in workforce participation, starting at disease onset¹⁰. This

emphasizes the need for early intervention.

WD rates have been studied little in other forms of inflammatory arthritis. In systemic lupus erythematosus, even higher rates of 40% WD have been reported after an average 3.4 years since diagnosis¹³. In psoriatic arthritis, WD in polyarticular disease approximates that of RA, whereas oligoarticular and spinal disease report little WD^{14,15}. In ankylosing spondylitis, a systematic review reports lower WD rates, although highly variable across studies, with WD rates ranging from 3% to 50% of samples¹⁶. These rates are particularly significant since inflammatory arthritis affects young individuals at the prime of their working life, with many expected years of active labor force participation.

WD profoundly affects the quality of life of patients and their families¹⁷ and obviously has major financial consequences for the patient and for society. There is the cost to the individual of the lost years of work from premature departure from the workforce. In a national population health survey studying working life expectancy, we found that women and men who reported having arthritis or MSK problems (excluding back pain) lost on average 3 and 4 years of working life expectancy, respectively¹⁸. There is also the cost of lower earnings for those who are still working. The earnings of women and men with inflammatory polyarthritis have been shown to be only 27% and 48%, respectively, of the earnings of individuals without arthritis¹⁹. A number of cost studies of RA have found indirect costs from lost productivity to exceed the direct medical cost of providing health care by up to 2-fold²⁰⁻²⁴. In Canada, among all chronic conditions, arthritis and MSK conditions incur the greatest amount of indirect costs¹. A recent evaluation of the eco-

From the Department of Medicine, University of British Columbia, and the Arthritis Research Centre of Canada, Vancouver, British Columbia, Canada.

D. Lacaille, MD, MHSc, FRCPC, Assistant Professor, Division of Rheumatology, University of British Columbia, Research Scientist, Arthritis Research Centre.

Address reprint requests to Dr. D. Lacaille, Arthritis Research Centre, 895 S 10th Avenue West, Vancouver, BC V5Z 1L7. E-mail: dlacaille@arthritisresearch.ca

nomic burden of illnesses by Statistics Canada estimated the yearly cost of work disability from arthritis and MSK conditions at \$13.6 billion²⁵.

ARTHRITIS AND EMPLOYMENT RESEARCH: WHERE ARE WE?

To date, research in the area of arthritis and employment has mostly focused on measuring the extent of the problem. There have been studies looking at prevalence and incidence of work loss, measuring the impact of arthritis on work and productivity, and determining the cost of productivity loss. Although fairly well studied in RA, gaps still remain in other inflammatory forms of arthritis.

Research has also focused on identifying the predictors of work loss. Most studies have been performed in RA or in mixed MSK conditions. Few studies have been performed in other forms of inflammatory arthritis. Interestingly, across studies and across diseases, the same risk factors are identified. Although measures of disease activity and severity are important risk factors, they only partially predict risk of work disability. Overall, they have less effect on WD than sociodemographic and work-related factors. This indicates that medical treatment, although important, will have a limited influence on work disability if it is the only strategy utilized to address this problem.

Despite the importance of the problem, there has been little research assessing the effectiveness of interventions, either medical treatment or interventions specifically aimed at employment, at reducing work loss, or improving ability to work.

Effect of medications on employment. Disease modifying antirheumatic drugs (DMARD) would be expected to reduce work disability, given their demonstrated efficacy at reducing disease activity and severity. However, this has not yet been confirmed in epidemiological studies or randomized controlled trials (RCT). The closest evidence comes from an extension study of a RCT of auranofin showing that delay in instituting DMARD was associated with increased risk of WD¹¹. Wolfe, *et al* found that earlier control of disease was associated with lower risk of WD⁷. However, a comparison of 2 historical cohorts from the early and late 1990s found no improvement in WD rates over time, as treatment paradigms shifted to more aggressive DMARD therapy⁹. Recently, RCT have looked at the effect of medical treatment on number of days lost from work, and found a beneficial effect for combination DMARD versus monotherapy²⁶, for anakinra²⁷, and for etanercept²⁸.

Effectiveness of interventions at work. Few observational studies of predictors of work disability have looked at the effect of interventions at work on risk of WD, and results

have been variable. Job accommodation, defined as adjustments made to a job to better adapt it to the abilities of the worker with arthritis, were found to have a favorable effect in one study²⁹, but not in 2 other RA studies^{10,30} or in a study of mixed MSK conditions³¹. However, job accommodations provided to people with disability have been shown to reduce work loss in the non-arthritis work disability literature. In a study of predictors of WD in RA, we found one type of job accommodation – ergonomic modification to the workstation – to be associated with a lower risk of work disability (OR 0.4)¹⁰. However, limitations inherent to observational studies limit their ability to assess the effectiveness of employment interventions. Without random allocation of the intervention, self-selection makes it difficult to assess effectiveness.

Effectiveness of interventions aimed specifically at improving employment. Despite the importance of the problem, few services are available to address employment issues for people with arthritis. There are even fewer studies assessing their effectiveness. This constitutes a huge unmet need from a health services research point of view. The most common type of intervention programs available are vocational rehabilitation services. Most target individuals who are already work disabled attempting to help them return to work. Studies have shown that success is limited and that use of these services by people with arthritis is low^{17,32}. Vocational rehabilitation programs likely intervene too late. Earlier intervention to prevent permanent work disability would likely be a preferable approach. A recent systematic review of vocational programs for arthritis identified only 6 studies that met review criteria³³. All studies were uncontrolled, and success was variable, with 15%–69% being successful at returning to work. Since then, a RCT showed that vocational counseling aimed at work retention, compared to printed material about disability employment issues and resources, delayed job loss³⁴.

ARTHRITIS AND EMPLOYMENT RESEARCH: WHERE DO WE NEED TO GO?

Evaluating the effectiveness of therapies on employment outcomes. We need to know whether commonly used therapies (medical, surgical, and other) for inflammatory arthritis are effective at improving employment outcomes. We also need to know whether different aspects of treatment strategies, such as timing or mode of health care delivery, make a difference. This is particularly true for new drugs such as biologics because of their cost. Given the extent to which total costs are driven by indirect costs in RA, research demonstrating a positive influence on employment outcomes may allow cost-effectiveness analyses to yield ratios within the range acceptable to health policy makers. In order to answer such ques-

tions, employment outcomes need to be included in RCT. RCT need designs that are suited to economic analyses. Employment outcomes also need to be studied with longitudinal observational studies where therapies can be evaluated in real life and with longterm data.

Research on employment interventions. Interventions aimed at reducing the burden of employment problems due to arthritis are needed and should be instituted early for greater effect. Studies on the effectiveness of such interventions on employment outcomes are also needed in the form of well designed RCT.

Research on methodology. Studies that address methodological challenges also need to be added to the research agenda. The selection of outcome measures in employment research is difficult. Since work disability develops only gradually over a long period, surrogate measures are needed, such as reduced days and hours of work. However, these measures do not capture all productivity loss. Further, work loss and even productivity loss measures do not capture the entire impact of arthritis on employment. There are other important and relevant outcomes, such as career advancement, job satisfaction, and quality of life while on the job. There is a need to shift away from the concept of "work loss," to look instead at "ability/disability while at work." New outcome measures have recently been developed to assess "limitations at work," such as the Work Limitation Questionnaire^{35,36} and the Working Stability Scale³⁷. Measures of productivity at work also exist. However, there are still limitations to the existing measures: these instruments need additional research, such as in assessing predictive ability.

The design of employment interventions and of studies evaluating them is challenging. A number of factors interact to influence decisions about work as well as employment outcomes. There is high variability in jobs, work settings, and in interactions between the specific demands of a job and the limitations imposed by the disease in each individual. These issues need to be taken into consideration when designing employment studies.

Finally, employment is not the only type of work. This dimension ignores the influence of arthritis on other types of work that is "unpaid," such as caring for family (children, elderly parents, or sick family members), volunteering and community work, and studying. Yet these activities are valued by people living with arthritis and also by society.

In summary, the impact of inflammatory arthritis on employment is an important problem that deserves more research. To date, investigation has focused on measuring the extent of the problem and on identifying the predictors of work disability. There has been little intervention research. The influence of currently used therapies on employment outcomes deserves attention, and interventions specifically aimed at employment should be devel-

oped and studied. Addressing methodological issues in employment research also belongs on the research agenda.

REFERENCES

1. Badley EM, Rasooly I, Webster GK. Relative importance of musculoskeletal disorders as a cause of chronic health problems, disability, and health care utilization: findings from the 1990 Ontario Health Survey. *J Rheumatol* 1994;21:505-14.
2. Felts W, Yelin E. The economic impact of the rheumatic diseases in the US. *J Rheumatol* 1989;16:867-84.3. Makisara GL, Makisara P. Prognosis of functional and work capacity in rheumatoid arthritis. *Clin Rheumatol* 1982;1:117-25.
4. Yelin EH, Henke CJ, Epstein WV. The work dynamics of the person with rheumatoid arthritis. *Arthritis Rheum* 1987;30:507-12.
5. Sokka T, Kautiainen H, Mottonen T, Hannonen P. Work disability in rheumatoid arthritis 10 years after the diagnosis. *J Rheumatol* 1999;26:1681-5.
6. Mau W, Bornmann M, Webger H, Weidemann HF, Hecker H, Raspe HH. Prediction of permanent work disability in a follow-up study of early rheumatoid arthritis: Results of a tree-structured analysis using RECPAM. *Br J Rheumatol* 1996;35:652-9.
7. Wolfe F, Hawley DJ. The long-term outcomes of rheumatoid arthritis: Work disability: A prospective 18 year study of 823 patients. *J Rheumatol* 1998;25:2108-17.
8. Jantti J, Aho K, Kaarela K, Kautiainen H. Work disability in an inception cohort of patients with seropositive rheumatoid arthritis: A 20 year study. *Rheumatology Oxford* 1999;38:1138-41.
9. Barrett EM, Scott DG, Wiles NJ, Symmons DP. The impact of rheumatoid arthritis on employment status in the early years of disease: A UK community-based study. *Rheumatology Oxford* 2000;39:1403-9.
10. Lacaille D, Sheps S, Spinelli JJ, Chalmers A, Esdaile JM. Identification of modifiable work-related factors that influence the risk of work disability in rheumatoid arthritis. *Arthritis Rheum* 2004;51:843-52.
11. Borg G, Allander E, Berg E, Brodin U, From A, Trang L. Auranofin treatment in early rheumatoid arthritis may postpone early retirement: Results from a 2-year double blind trial. *J Rheumatol* 1991;18:1015-20.
12. Fex E, Larsson BM, Nived K, Eberhardt K. Effect of rheumatoid arthritis on work status and social and leisure time activities in patients followed 8 years from onset. *J Rheumatol* 1998;25:44-50.
13. Partridge AJ, Karlson EW, Daltroy LH, et al. Risk factors for early work disability in systemic lupus erythematosus: Results from a multicenter study. *Arthritis Rheum* 1997;40:2199-22.
14. Coulton BL, Thomson K, Symmons DP, Popert AJ. Outcome in patients hospitalized for psoriatic arthritis. *Clin Rheumatol* 1989;8:261-5.
15. Roberts MET, Wright V, Hill AGS, Mehra AC. Psoriatic arthritis follow-up study. *Ann Rheum Dis* 1976;35:206-12.
16. Boonen A, de Vet H, van der Heijde D, van der Linden S. Work status and its determinants among patients with ankylosing spondylitis. A systematic literature review. *J Rheumatol* 2001;28:1056-62.
17. Straaton KV, Fine PR, White MB, Maisiak RS. Disability caused by work-related musculoskeletal disorders. *Curr Opin Rheumatol* 1998;10:141-5.
18. Lacaille D, Higgs RS. The effect of arthritis on working life expectancy. *J Rheumatol* 2001;28:2315-9.
19. Mitchell JM, Burkhauser RV, Pincus T. The importance of age, education, and comorbidities in the substantial earning losses of individuals with symmetric polyarthritis. *Arthritis Rheum* 1988;31:348-57.
20. Cooper NJ. Economic burden of rheumatoid arthritis: a systematic review. *Rheumatology Oxford* 2000;39:28-33.

21. Meenan RF, Yelin EH, Henke CJ, Curtis DL, Epstein WV. The costs of rheumatoid arthritis: A patient-oriented study of chronic disease costs. *Arthritis Rheum* 1978;21:827-33.
22. Stone CE. The lifetime economic costs of rheumatoid arthritis. *J Rheumatol* 1984;11:819-27.
23. Allaire SH, Prashker MJ, Meenan RF. The costs of rheumatoid arthritis. *Pharmacoeconomics* 1994;6:513-22.
24. Lubeck DP. The economic impact of arthritis. *Arthritis Care Res* 1995;8:304-10.
25. Health Canada. Economic burden of illness in Canada. Ottawa: Policy Research Division, Health Canada; 1998.
26. Puolakka K, Kautiainen H, Mottonen T, et al. Impact of initial aggressive drug treatment with a combination of DMARDs on development of work disability in early RA. A five year randomized follow-up trial. *Arthritis Rheum* 2004;50:55-62.
27. Bresnihan B, Cobby M. Clinical and radiological effects of anakinra inpatients with rheumatoid arthritis. *Rheumatology* Oxford 2003;42 Suppl 2:ii22-8.
28. Yelin EH, Trupin L, Katz P, Lubeck D, Rush S, Wanke L. Association between etanercept use and employment outcomes among patients with rheumatoid arthritis. *Arthritis Rheum* 2003;48:3046-54.
29. Chorus AMJ, Miedema HS, Wevers CMJ, van der Linden SJ. Work factors and behavioural coping in relation to withdrawal from the labour force in patients with rheumatoid arthritis. *Ann Rheum Dis* 2001;60:1025-32.
30. Allaire SH, Anderson JJ, Meenan RF. Reducing work disability associated with rheumatoid arthritis: Identification of additional risk factors and persons likely to benefit from intervention. *Arthritis Care Res* 1996;9:349-57.
31. Yelin EH, Sonneborn D, Trupin L. The prevalence and impact of accommodations on the employment of persons 51-61 years of age with musculoskeletal conditions. *Arthritis Care Res* 2000;13:168-76.
32. Straaton KV, Fine PR. Addressing work disability through vocational rehabilitation services. *Bull Rheum Dis* 1997;46:1-3.
33. de Buck PDM, Schoones JW, Allaire SH, Vliet Vlieland TPM. Vocational rehabilitation in patients with chronic rheumatic diseases: A systematic literature review. *Semin Arthritis Rheum* 2002;32:196-203.
34. Allaire SH, Li W, La Valley MP. Reduction of job loss in persons with rheumatic diseases receiving vocational rehabilitation: A randomized controlled trial. *Arthritis Rheum* 2003;48:3212-8.
35. Lerner D, Reed JL, Massarotti E, Wester L, Burke T. The Work Limitations Questionnaire's validity and reliability among patients with osteoarthritis. *J Clin Epidemiol* 2002;55:197-208.
36. Lerner D, Amick BC 3rd, Rogers WH, Malspeis S, Bungay K, Cynn D. The Work Limitations Questionnaire. *Med Care* 2001;39:72-85.
37. Gilworth G, Chamberlain MA, Harvey A, et al. Development of a Work Instability Scale for rheumatoid arthritis. *Arthritis Rheum* 2003;49:349-54.