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Arthritis and Society

The Impact of Musculoskeletal Diseases

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Preface

The clinical understanding of arthritis and the rheumatic diseases has traditionally focused on the personal experience of illness: the joint pain, the limitation of joint function, and the systemic and extra-articular manifestations of a large number of diseases that afflict a very large number of people. We, the editors, have enjoyed a decade of dialogue that has attempted to broaden this perspective. Rheumatic diseases threaten autonomy in a fashion that overshadows the symptoms medicine is wont to elicit. Perturbation of family life, compromise of wage-earning capacity and restriction of sphere of influence are more pervasive and catastrophic than the joint pain itself. In view of the great number of the afflicted, the rheumatic diseases take their toll on society at large: they reduce industrial productivity, swell the disability rolls, stretch our health care capacity and place constraints on our architecture. When Butterworths offered the opportunity, we did not hesitate to accept the challenge of assembling a volume that examined the interaction between the structure of our society and the impact of rheumatic diseases on the lifestyle of those afflicted. *Arthritis and Society* is our attempt to set a precedent for such an exercise – a precedent that could serve investigators in clinical disciplines other than rheumatology. If we are successful it is because our appreciation of the literature allowed us to identify and recruit, or even coerce, a cadre of contributing authors whom we consider innovative thinkers in their areas of expertise.

Rheumatic diseases are best understood once one realizes that they fall into two broad categories: systemic rheumatic diseases and regional rheumatic diseases. The systemic diseases include rheumatoid arthritis, systemic lupus erythematosus, scleroderma, polymyositis and the vasculitides, to name a few. The afflicted are chronically ill, intermittent and remittent easy fatigability, suffering stiffness and generalized weakness. Joint pain and deformity are often features of these diseases. But the cardinal feature is the pervasive sense of being sick for prolonged periods. These systemic rheumatic diseases afflict perhaps 3% of the population.

People with regional rheumatic diseases are basically well people. They suffer from pain and functional restriction in a single musculoskeletal region. Examples include low back pain, neck pain, tennis elbow, shoulder pain (so-called ‘bursitis’) and carpal tunnel syndrome. These illnesses vary in intensity, tend to be self-limited and usually remit, leaving little residual deficit. Even at the height of illness, patients often state that they would be well were it not for the pain in the neck, or back, or wherever. Therefore the implications of these diseases may not be

major from the point of view of traditional medicine, which emphasizes sophisticated care for the very sick. But from the patient's point of view, the experience of a regional musculoskeletal disease can seem catastrophic indeed. For example, aside from the pain, restriction of musculoskeletal function can greatly limit work capacity. Considering that regional musculoskeletal disease will afflict all of us at some time during our lives, and probably 20% of the population for at least a few days in any given year, the amount of suffering is enormous. In view of the large numbers of sufferers, the implications for society are dramatic. For example, low back pain rivals the common cold as the most frequent cause of absence from the workplace.

In order to produce a volume that is both rigorous and comprehensive in its analysis of the impact of musculoskeletal disease on society, we have drawn a distinction between the private and public experience of illness. Section 1 considers the personal experience of pain of the groups frequently afflicted. The epidemiology and scope of the systemic rheumatic diseases are discussed. Special populations coping privately with regional rheumatic complaints are considered, as well as the elderly and the recreational athlete. The extent to which a rheumatic disease intrudes into the family unit is examined. Section 1 attempts to draw as clear and accurate a picture as possible of the intimate plight of the extraordinary number of our fellows who are afflicted with rheumatic disease.

Section 2 views the plight of those suffering from rheumatic disease from a different perspective. All of us have a 'workplace', be it our home or town about which we must move, or the setting in which we seek gainful employment. Because of their impaired musculoskeletal function, all patients with rheumatic diseases must to some degree adapt to their workplace. Since the late 19th century, increasing attempts have been made in the Western world to offer some recourse to those afflicted with illness who are unable to find gainful employment. Legislation for workers' compensation and disability programs has been instigated in response to this need. These programs and their effectiveness are discussed in detail in Section 2. The differences in the approaches and results in the various countries not only illustrate the scope of the issue, but also form the basis of an unintended international social science experiment. This section also considers the problems faced by those with musculoskeletal incapacity in industrial employment, and by the employer attempting to provide a safe environment for such a person.

Section 3 discusses the importance of appropriate care and of building a more compassionate society which will lessen the impact of the disease. The role of rehabilitation is stressed. Consideration by city planners of the special needs of the disabled is long overdue. Improvements in the development and provision of more efficient drugs are explored, and ways of assessing costs and benefits of any intervention are discussed. This section concludes by advocating a more efficient, integrated health care delivery system.

Without exception, all the authors wished they had had access to this volume before writing their own chapter. This indicates clearly the dearth of information on the subject of musculoskeletal diseases and their impact on society. It also emphasizes the pioneering nature of the authors' efforts. As editors, we took great pleasure in watching and helping this treatise develop. Its very incompleteness stands as a challenge to clinical and health service research. We hope that by the time we come to update this volume the response will be gratifying.

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Introduction

Nortin M. Hadler and Dennis B. Gillings

The first three chapters of this section are designed to draw the reader into the world of the patient suffering from one or more systemic rheumatic diseases. These diseases, exemplified by the emphasis on rheumatoid arthritis in Chapters 1 and 3 and on systemic lupus erythematosus in Chapter 2, permeate the entire lifestyle of the afflicted. We offer no discussion of the pathophysiology of the organ damage wrought by these diseases: such is readily available in any standard textbook of rheumatology. Rather, we are seeking insights into the pathophysiology that confounds healthy living and successful function. Systemic rheumatic diseases batter the aspirations and negate the influence of the afflicted far more predictably than they damage organs.

In order to dissect the pathophysiology of maladaptation to life's demands, one must appreciate the range of social settings in which the illness occurs. Drs Liang and Daltroy introduce the nosology customarily applied and demonstrate the extent of the challenge for the patient with a disease such as rheumatoid arthritis. Next, Dr Hochberg uses the epidemiological data on systemic lupus erythematosus to illustrate the impact which collagen-vascular diseases can have on personal life. Mr Bury then continues with a comprehensive assessment of the effects of chronic inflammatory rheumatic disease on relationships within the family. The challenges facing medicine and public health in terms of categorization of illness and measurement of impact are clearly outlined in these three chapters. (The possibilities for solutions are taken up in Section 3.)

The last two chapters of this section introduce the reader to the concept of regional rheumatic diseases. These are diseases that cause musculoskeletal pain and dysfunction in individuals who are otherwise well. The chapters focus on two special populations: in the elderly, musculoskeletal symptoms greatly compromise the quality of life and, as Dr Williams illustrates, may even interfere with the ability to maintain independent living. Dr Panush offers a long-overdue assessment of the potential risks associated with the recreational craze for demanding physical activity. Data on such activities from a public health perspective are unfortunately scant, but the immediate implications are reflected in the increasing number of acute sports injuries. The long-term effects, however, many of which may well be positive, still need to be determined. These two chapters set the stage for Section 2, in which the implications of having a rheumatic disease, particularly a regional musculoskeletal disease, on work capacity are probed. However, the topics of musculoskeletal disease in the elderly and in recreational athletes will be rejoined in Section 3 where they are considered in the context of health maintenance policy.

1

The impact of inflammatory arthritis on society and the individual: options for public health programs

Matthew H. Liang and Lawren H. Daltroy

THE INFLAMMATORY ARTHRITIDES

Over 100 forms of arthritis exist in which joint pain or swelling are either the dominant clinical problem or occur as part of a systemic illness (Decker *et al.*, 1983). Of these, about 11 diseases and their subtypes have the potential of causing joint destruction. Some of these diseases have a known cause or causes and can be cured if treated appropriately. These are, by and large, arthritides caused by various infectious agents and crystal deposition. Others have obscure causes or result from partially understood aberrations of the immune system, and have an unpredictable course.

In the United States, inflammatory arthritis affects about 10 million persons. The most prevalent is rheumatoid arthritis, with an estimated 7 million patients. The other inflammatory arthritides and their epidemiological features are given in *Table 1.1*.

Rheumatoid arthritis (RA), the commonest chronic inflammatory arthritis, is among the most disabling because of its propensity for striking multiple joints and the lack of a cure. Having been studied extensively, it is a paradigm for understanding the impact of the other inflammatory arthritides.

THE NATURE OF THE INFLAMMATORY DISEASE PROCESS

Joint inflammation may be caused by synovitis (inflammation of the lining of the joints) or occur as the result of crystal deposition (monosodium urate, calcium pyrophosphate, hydroxyapatite). Joint inflammation may progress inexorably despite treatment, remit (heal spontaneously or by treatment), or heal with ankylosis (bone bridging the joint space). The amount of joint damage caused by inflammation is directly related to the degree and duration of inflammation.

Persistent joint inflammation causes local destruction of cartilage, bone and ligaments. Inflammation in the joint may also occur with inflammation in other tissues such as blood vessels (vasculitis), which, if severe, can cause symptoms or dysfunction in the organs which the vessels nourish. Thus, in some patients, erosive joint disease may be compounded by vasculitis, causing destruction of peripheral

Table 1.1 Epidemiology of selected forms of inflammatory arthritis

	Sex ratio (women:men)	Race ratio (black:white)	Overall prevalence (per 100)	Overall incidence (per 100)	Reference
Rheumatoid arthritis	3:1	1:1	0.3-1.0	0.075	Lawrence (1977)
Ankylosing spondylitis	1:10	?	0.01	?	Masi and Medsger (1979)
Juvenile arthritis	1.5:1	?	0.02-0.10	?	Gewanter, Roghmann and Baum (1983)
Reiter's disease	?	?	?	?	
Systemic lupus erythematosus	5:1	4:1	0.005	0.007	Masi and Medsger (1979)
Gout	1:7	-	0.3	0.1	Kellgren (1964)
Pseudogout	?	?	?	?	O'Sullivan, Cathcart and Bolzan (1968)
Systemic sclerosis	2.5:1	2:1	?	0.001	Masi and Medsger (1979)
Polymyositis/dermato- myositis	2:1	3:1	?	0.001	Masi and Medsger (1979)
Psoriatic arthritis	?	?	?	?	-
Infectious arthritis	?	?	?	?	-

nerve, muscle, etc. Except for infectious arthritis, inflammatory joint diseases take a variable, unpredictable course, ranging from a single attack to an aggressive, progressive course. The commonest pattern is a slowly progressive course punctuated by flare-ups and remissions (*Figure 1.1*).

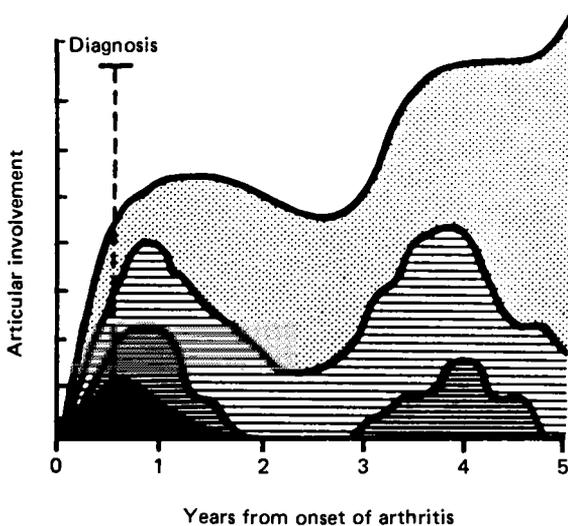


Figure 1.1 Schematic diagram of articular course patterns in rheumatoid arthritis. (▨) Progressive course (10%); (▨) polycyclic (70%); (■) monocyclic (20%). (From Masi, Feigenbaum and Kerplan, 1983, courtesy of the Editor and Publishers, *American Journal of Medicine*)

In most forms of inflammatory arthritis the precise pathobiology is unknown. It is likely to be the result of a complex interplay between host, environment and, occasionally, a specific pathogen (infectious arthritis) or chemical substance (the crystalline arthritides). The inheritance of rheumatic disorders is not understood in great detail. Recent developments show a striking prevalence of tissue type HLA B27 in the spondyloarthropathies (ankylosing spondylitis, Reiter's disease, etc.). Persons who have HLA B27 are at increased risk of developing Reiter's disease when exposed to a growing list of enteric pathogens. Specific modes of inheritance are not predictable, thus making genetic counseling impossible.

CONCEPTUAL FRAMEWORK FOR UNDERSTANDING DISABILITY

Disability in inflammatory arthritis can be understood by building on the conceptual framework first developed by Nagi (1965). Nagi distinguished four aspects of disability. *Pathology* is characterized by a disease or injury which interrupts normal processes and includes the reaction of the body in order to restore it to normality. *Impairment* is defined as an anatomical loss or damage. It is

a physiological condition – the product of either pathology or some non-pathological deformation. An impairment may impose *functional limitations*. Unlike impairment, which is a physiological state, *disability* is seen as a form of behavior in reaction to that condition. Disability occurs when the functional limitations imposed by an impairment interfere with normal, expected activities or roles. In the context of work, disability occurs when functional limitations interfere with and interrupt job requirements.

The classification of disability by the World Health Organization (Wood, 1980) is similar to Nagi's. This important nosologic system is quoted in detail below:

Impairment: any loss or abnormality of psychological, physiological, or anatomical structure or function. Impairments signify that a pathological state is exteriorized. In principle, this represents disturbance at the organ level, and the major subclasses of impairment are intellectual, other psychological, language, aural, ocular, visceral, skeletal, disfiguring, generalized, and sensory.

Disability: any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being. Disabilities reflect the consequences of impairment in terms of functional performance and activity. Disabilities represent disturbances at the level of the person, and the principal subclasses are concerned with behaving, communicating, personal care, locomotion, body disposition, dexterity, particular skills, and specific situations.

Handicap: a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfillment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual. Handicaps are concerned with interaction with and adaptation to the individual's surroundings, and they represent socialization of an illness experience. Thus, they occur when there is interference with the ability to sustain what may be designated as 'survival roles' – orientation, physical independence, mobility, occupation, social integration, and economic self-sufficiency.

The WHO distinctions also define, in part, the relevant components of the health care system which need to respond. Thus, impairments are primarily the concern of medicine, disabilities of rehabilitation, and handicaps of social welfare programs. Disabilities and handicaps are also the concern of social programs for education, employment and housing.

The complex nature of disability and the relationships between its components are reflected in a variety of definitions of disability and of criteria to evaluate it.

For example, the American Medical Association (1971) focuses on clinical evidence in *rating* disability. It recognizes an impairment as a purely medical condition, whereas disability is not. In this view physicians are seen as uniquely capable of evaluating an impairment, but not a disability, because non-medical factors are difficult to measure. The American Medical Association (1971) concluded that 'permanent impairment is the sole or real criterion of permanent disability far more often than is readily acknowledged'.

In contrast, in vocational rehabilitation, disability is viewed as a limitation in an individual's capacity to perform his economic and social roles as a result 'of not only a physical or mental functional limitation but also of the individual's adjustment to it' (United Nations, 1977). The ultimate test of disability, then, is not the impairment itself but vocational problems imposed by both an impairment and other individual factors.

Inflammatory disease does not occur in a vacuum, but in a complex host with membership in a race, culture and society which defines, in part, the illness created by the disease. The model is depicted in *Figure 1.2*. We believe that each step in this pathway is reversible and that progression is modified by a host of variables, a number of which are potentially modifiable by public health or health policy strategies. The cause(s) of rheumatic diseases are influenced by host phenomena, such as host susceptibility, and possible environmental factors. Uncontrolled

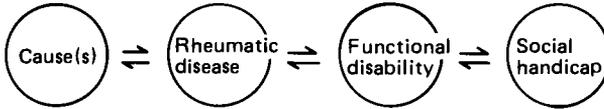


Figure 1.2 Model of arthritis morbidity

inflammatory arthritis leads to joint destruction, pain and limitation of normal joint motion. These elements contribute to an inability to perform routines of daily life, self-care, employment and recreation – functional disability. This progression can be affected by health care (medical, surgical and/or rehabilitative care). Access, health manpower and health-care financing determine, in part, the distribution and quality of help; patient compliance (cooperation in self-management) with a long-term program influences the effectiveness of these interventions. Whether or not inflammatory arthritis is controlled, an individual may suffer considerable social handicap from his or her affliction. Personality as well as environmental factors, e.g. the existence of social support, can modulate the expression of social handicap in an individual with an arthritic disability. Strong personal motivation may overcome barriers resulting from structural deficits. Social support can diminish the emotional or psychological impact of chronic disease or make it worse if it is not effective. Cultural attitudes towards those with physical disabilities can increase the stress of having arthritis. The lack of public access to public buildings may increase their social isolation. Financial independence can moderate the effects of work disability on the one hand, while on the other its absence increases the individual’s dependency on society for basic needs.

The great challenge to an enlightened society is the development of systems and social policies to minimize the impact of devastating, yet not life-threatening disorders such as the inflammatory arthritides.

FUNCTIONAL IMPACT OF THE INFLAMMATORY ARTHRITIDES

Musculoskeletal disease of all types is the leading cause of activity limitation in the US, affecting 6.3 million individuals (Reynolds, 1978). Estimates of the functional impact of inflammatory arthritis are imprecise, because the available data do not distinguish these disorders from other forms of arthritis and because the measurement of function is still problematic (Liang and Jette, 1981; Liang, Cullen and Larson, 1982).

The relationship between functional impairment and rheumatic disease is complex. Function is dependent on the external factors discussed above as well as on specific disease characteristics. In rheumatoid arthritis, disease activity and joint inflammation vary from day to day, even from hour to hour. Patients with

inflammatory arthritis tend to have stiffness, particularly after periods of joint rest, which can inhibit spontaneous mobility. The typical pattern is one of stiffness on rising in the morning. This may take from a few minutes to several hours to improve. Chronic fatigue due to physical deconditioning and other ill-understood factors is also prominent and may further limit function and options.

Variation in the disease activity has other implications. Early on, patients frequently have a slow additive pattern of progressive joint involvement. Remission is always possible but rarely predictable. Because of the waxing and waning and often unpredictable course, patients may feel considerable uncertainty as to what to expect, and, more importantly, lose the ability to plan for the future (Weiner, 1975). In countries where the social welfare system provides benefits to the disabled, the length of disability is an important criterion for determining disability but can work against patients who wish to return to work after a flare-up.

The type and number of joints involved also influences the type and severity of functional limitation. Patients with predominantly hand and ankle involvement, a common presentation, can have difficulties with activities requiring a powerful grip and dexterity, and with walking. Elbow involvement may be considerable before function is affected. Involvement of the neck causes different problems and may, for example, interfere with the use of rear view mirrors while driving, thus restricting options for travel and contributing to social isolation. Uncontrolled synovitis may eventually lead to so much structural damage that pain is induced by the slightest use of the involved joint; in other patients, structural damage may be minimal and the symptoms of pain and stiffness can be improved with medications and physical treatment. Work requirements may hide or exaggerate a given impairment. For instance, a pianist would be significantly hindered by synovitis of the hands and wrist, while this might not affect a patient who is a receptionist and does not require fine motor dexterity or a large finger span.

Severe disability is fortunately unusual, possibly occurring in about 10% of patients with uncontrolled rheumatoid arthritis. Ankylosing spondylitis, psoriatic arthritis and Reiter's syndrome are conditions generally associated with a *good* prognosis for long-term function, and patients can usually lead fairly normal lives.

FINANCIAL IMPACT

In the United States, musculoskeletal conditions rank second to diseases of the circulatory system in terms of total economic costs to society and first among all disease groups in cost through lost earnings (Kelsey, Pastides and Bisbee, 1978). The total annual cost attributed to musculoskeletal conditions has been estimated to be about \$20 billion per year (Kelsey, Pastides and Bisbee, 1978). Musculoskeletal conditions rank third in frequency of occurrence in acute conditions, second in number of visits to physicians, fifth in number of visits to hospitals, and third in number of operations in hospitals (Kelsey, Pastides and Bisbee, 1978).

In the US, rheumatoid arthritis accounts each year for 2.1 million visits to physicians for the treatment of arthritis, 3.5 million physician visits for all care, 100 000 hospitalizations, 6.9 million bed days for the treatment of arthritis, and 2.2 million work days lost (Kramer, Yelin and Epstein, 1983). Patients with early rheumatoid arthritis suffer no major loss of wage earning capacity compared with controls, but may fail to advance in earnings as expected (Fox *et al.*, 1976). In a

study of patients with advanced disease, 50% of wage earning capacity was lost, with indirect cost being greater than direct cost (Meenan *et al.*, 1978, 1981). Direct medical costs for this group were three times the national average, with only 58% of the costs covered by insurance. Indirect costs due to lost income were three times the direct medical costs, and transfer payments covered only 42% of these costs. Spitzer *et al.* (1976) found that patients with arthritis/rheumatism complaints used health care services at costs 78% higher than average expenditures in the community.

Aggregate data on the financial impact of arthritis do not give the entire picture, as some patients incur devastating losses while others have only moderate costs. A person's functional status influences the cost of medical care and indirect costs. These differences are rarely taken into account in economic projections, which are usually based on small samples of selected individuals with ill-defined, heterogeneous conditions of varying severity (Liang, Larson, and Thompson, 1984).

In the US, rheumatoid arthritis is among the top 10 diagnoses for which federally financed disability insurance has been awarded, accounting for 1.8% of all awards in 1976, i.e. almost 25 000 awards per year. Overall, about half of those applying for disability status because of musculoskeletal problems have their applications rejected (Social Security Bulletin, 1980). Acceptance of the application depends on many factors, including age, the degree of impairment, previous work, and degree of education. Currently, minimum medical requirements must be met. However, there are problems with this approach: criteria for work disability from musculoskeletal impairment are more difficult to define than disability from pulmonary, renal or cardiovascular disease because clinical or laboratory tests do not quantitatively relate musculoskeletal function to a person's work capacity. Fatigue and endurance are not taken into account (Meenan, Liang and Hadler, 1983). The impact of the disease on impairment and disability leads to difficulties in judgment which cannot be reliably arbitrated by physiological or clinical evidence. Pain may also be disabling but is often not consonant with degree of clinical activity.

Yelin *et al.* (1980) surveyed 180 persons with rheumatoid arthritis, aged 21–65, who were employed in their last pre-morbid year. About 60% were disabled at the time of the study, which was an average of 10 years after onset of the disease. Disability was significantly more likely if the disease was more severe and of longer duration. There were no positive effects on work from any of the drug, medical or surgical therapies patients received. Single persons were less likely to become disabled than those ever married. Interestingly, white-collar workers experienced only slightly less disability than service workers and manual laborers. On the other hand, the factors measuring work autonomy were strongly associated with the probability of work loss. Self-employed persons had a 28% probability of disability, compared to a 62% probability for those who worked for someone else. Similarly, those who could control the pace or activities of work were less likely to be disabled.

PSYCHOSOCIAL IMPACT

Added to the physical and financial costs of arthritis are the psychosocial problems caused by the disease. Despite efforts to quantitate these effects, statistics cannot adequately express the amount of suffering (Rogers, Liang and Partridge, 1982;

Ehrlich, 1983). Much of the literature suggesting that stress or personality factors predispose to rheumatoid arthritis has been criticized as methodologically weak (Spergel, Ehrlich and Glass, 1978; Achterberg-Lawlis, 1982; Baum, 1982). It is more likely that stress modifies a patient's appreciation of symptoms and may possibly aggravate the illness. A growing body of evidence suggests a link between stress and aspects of immunity (Rogers, Dubey and Reich, 1979).

Arthritis limits functional capacity for self-care, work and leisure, and thus leads to the need for adjustment. Disability is a blow to a person's self-esteem and self-image, and the ability to cope with it will depend on factors such as attitude towards illness (denial, resentment, etc.); fear of deformity and altered body image; feelings about dependency and accepting help from others; mood (withdrawn, anxious, optimistic); ability to communicate with others; and flexibility or resourcefulness in times of adversity. Work restrictions caused by arthritis limit the opportunities for social intercourse, and the feeling of independence and personal worth.

Arthritis is frequently associated with aging; for young people it can therefore be stigmatizing. Family disruption, manifested by marital conflict and divorce, is commoner in patients with arthritis (Meenan *et al.*, 1981; Liang *et al.*, 1984). In a study of 100 patients with arthritis, Ferguson and Figley (1979) found a high rate (55%) of sexual problems. These problems may be due to pain, fatigue, loss of interest, limited range of movement, or the partner's fear that intercourse may cause pain. A Japanese study of 91 married women with rheumatoid arthritis showed similar problems, with 50% reporting diminished libido after the onset of illness (Yoshino and Uchida, 1981). Meenan *et al.* (1981), in a survey of 245 patients with rheumatoid arthritis, found that 85% had made a major change in their leisure activities, and 18% had changed their place of residence because of their arthritis. Family members of 6% had changed employment status to compensate for the impact of the illness.

PUBLIC HEALTH STRATEGIES

Three major public health strategies may be considered in arthritis: primary prevention by health promotion or specific prevention; secondary prevention by early diagnosis and treatment or disability limitation; and tertiary prevention through rehabilitation.

Public health programs have made a major impact on mortality and morbidity from infectious diseases, yet are nonexistent for arthritis. Primary prevention requires the identification of manipulable causative agents or facilitating factors such as infectious agents or toxic substances. Of the inflammatory arthritides few have a known cause and specific treatment, making secondary prevention (by early diagnosis and treatment) virtually impossible. The best hope for the future lies in fundamental research to elucidate the mechanisms of these conditions (Proceedings of Prevention Conference on Arthritis, 1983).

Secondary prevention by early detection and treatment is not feasible for three major reasons. At present, no diagnostic tests exist for distinguishing between the various forms of arthritis; no tests identify patients at high risk at a presymptomatic phase; and no specific treatment is available for the vast majority of patients. Early

detection and treatment may prevent the infectious arthritides, post-dysenteric Reiter's disease, and arthritis from sexually transmitted diseases (syphilis, gonorrhoea). The latter two disorders would be controlled more effectively by prevention of the primary infection and secondary case identification. Tophaceous gout, the most serious crippling form of gout, represents no more than 3% of all forms of gout (O'Duffy, Hunder and Kelley, 1975) and is preventable by early diagnosis and treatment with uric acid lowering agents. Tophaceous gout rarely or never occurs without prior acute gout; it would thus be prevented most efficiently by educating physicians who see these patients and educating patients to comply with the prescribed regimen. Risk factors for acute gout include hyperuricemia, thiazide use, moonshine alcohol (saturnine gout), obesity, high alcohol consumption and high-purine diets, but the predictive value of these factors is weak and the value of treating asymptomatic individuals is uncertain (Liang and Fries, 1978). Thus, early detection and treatment cannot be recommended.

In the absence of clear evidence that early detection and treatment prevents inflammatory arthritides other than those mentioned earlier, an argument could be made for better access of patients with arthritis to the health care system and for better management of these disorders to prevent their medical sequelae and disability. The Arthritis Foundation (1981) found that, despite intensive public education campaigns, rheumatoid arthritis sufferers wait an average of 4 years after the first symptoms appear before seeking proper medical care. This delay may be due to the frequently held misconception that arthritis is inevitable with aging, cannot be treated effectively, and is not a serious disorder (Badley and Wood, 1979; Price *et al.*, 1983). The use of quackery and unproven remedies, which costs almost a billion dollars a year, may also cause delay. Public information campaigns to improve symptom recognition and self-referral for diagnosis and care still fall far short of their potential as a preventive strategy (Arthritis Foundation, 1982). Understanding why patients do or do not seek health care or quack cures is an important area for research. Concern for the financing of health care is relevant to access.

Another potential public health initiative is to improve the number and distribution of health professionals skilled in the management of chronic arthritis. Physicians and allied health professionals trained in rheumatology tend to cluster in urban centers, leaving rural and/or economically deprived areas with less than adequate coverage (Yelin, Henke and Epstein, 1977; Schumacher and Lockshin, 1981). Training mid-level practitioners (nurse practitioners, physician assistants, etc.) in rheumatology management is not likely to improve access or the distribution of health manpower but might improve the efficiency of current practice. Most patients with musculoskeletal complaints present to general physicians; it is therefore, most important to educate practicing physicians to identify important forms of arthritis and to refer when appropriate. The education of physicians in rheumatology has grown rapidly since the mid-1960s, but better techniques are needed to improve the effectiveness of continuing education for practicing physicians (Greene and Simmons, 1976; Stross and Bole, 1979, 1980).

Patients with inflammatory arthritis may have to contend with their disease for the rest of their lives, and it is essential that they are brought into the management process with their health care providers. In rheumatoid arthritis, patient compliance with medical and rehabilitation regimens averages 50% (Deyo, 1982), mirroring the general degree of compliance with long-term treatment regimens (Sackett and Snow, 1979). Patient compliance would probably improve if health

educational programs, especially those including behavioral methods, were brought to bear on this problem (Mazzuca, 1982). Despite advances in methods of patient education and increasing interest among physicians, there is little evidence that clinicians are being trained in their use (Bartlett, 1984). Although medical schools are placing greater emphasis on teaching interpersonal skills, they generally follow a psychotherapeutic model (Strecher, 1982); specific patient education skills should be taught to all primary care givers using an educational model.

Social handicaps depend greatly on policies on access to public buildings, worker's compensation and disability insurance, and both health and social policy thus have an important role to play in improving the quality of life of the disabled. The unique problems of these patients in the workplace require an approach which recognizes the clinical features of the individual disorders and provides incentives for continuing work, returning to work, or job retraining. Job autonomy is important in maintaining employment, and increasing job flexibility may be one way to extend the working life of those with inflammatory arthritis (Yelin *et al.*, 1980). Modification of the workplace would allow some individuals to continue working and reduce stress on involved joints.

The final common pathway of all forms of uncontrolled inflammatory arthritis is functional disability, and this makes the preservation of mobility and prevention of disability and social handicaps the major goal for rehabilitation. The present health care system, with its emphasis on acute life-threatening illnesses and the medical model, is ill-suited to the needs of the chronically ill and disabled (Gillick, 1984). Rehabilitation medicine and related specialties, such as physical and occupational therapy and vocational counseling, are poorly organized in most countries and need greater emphasis in practice, research and funding.

Finally, basic data on the incidence and prevalence of many forms of inflammatory arthritis are unknown, making rational planning for public health difficult. Simple, economical methods need to be developed to provide surveillance information on the impact of these disorders, identify 'epidemics', and target areas for special resources and programs. Studies suggest that periodic surveys of the functional consequences of chronic arthritis in small health services areas are feasible and may be an effective way to maintain surveillance of a population (Liang *et al.*, 1981).

In summary, the inflammatory arthritides are an important group of heterogeneous diseases whose cause and specific treatment are largely unknown, and which contribute significantly to the morbidity and diminished quality of life of a large segment of the population. Traditional public health approaches, although successfully applied to many communicable diseases, must await better understanding of basic disease mechanisms before being widely applicable to arthritis. Meanwhile, we must develop new approaches which aim to ameliorate the disability and social handicap while recognizing the special features of these diseases.

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