**ABSTRACT**

Rheumatoid arthritis (RA) is a common chronic inflammatory disorder with destructive and systemic consequences. The disease is associated with substantial physical, psychosocial, and economic effects, and long-term patient prognosis is poor. Although the cause of RA remains unknown, a growing understanding of disease pathogenesis has led to advances in treatment and improved patient outcomes. Early detection and aggressive therapy can slow disease progression and prevent irreversible damage. A multidisciplinary approach by healthcare professionals working together is essential to the optimal management of patients with RA. (Adv Stud Nurs. 2008;6(2):26-31)

Arthritis encompasses at least 100 distinct conditions, the most common being osteoarthritis, gout, and rheumatoid arthritis (RA). It is the leading cause of disability in the United States and a massive public health problem. Approximately 46 million adults (20% of all adults) in the United States report having physician-diagnosed arthritis, making it second in self-reported disease prevalence after pulmonary conditions (49.2 million). Hypertension follows in prevalence at 36.8 million. Arthritis causes activity limitations in nearly 20 million adults, resulting in decreased functional capacity and diminished quality of life. Each year, arthritis leads to approximately 750,000 hospitalizations and 36 million outpatient visits. Annual direct and indirect medical costs attributable to arthritis are estimated at $81 billion and $127 billion, respectively. As the US population ages in the coming decades, the number of adults with arthritis and arthritis-attributable activity limitations is expected to grow, reaching 67 million and 25 million, respectively, by 2030.

Although the incidence of arthritis is more common among women and older adults, nearly 66% of people with arthritis are younger than 65 years of age. Arthritis affects adults and children of all races and ethnicities, and global prevalence is expected to soar in the coming decades. Indeed, in light of this increasing problem, the United Nations, the World Health Organization, and 37 countries have declared the years 2000 to 2010 to be “The Bone and Joint Decade.” These organizations have launched a global initiative to improve the lives of those with musculoskeletal disorders through advancement of knowledge and treatment of these disorders through prevention, education, and research.

**EPIDEMIOLOGY**

Rheumatoid arthritis is a global disease with an estimated annual incidence of 30 in 100,000 adults. Its prevalence is approximately 1% in Caucasians, but varies among races from 0.1% in rural Africans to 5%...
in Pima and Chippewa Indians. Prevalence is 2- to 3-fold higher in women and can range up to 5% in women over the age of 65. Although RA affects all ages, including children and the elderly, the mean age at onset is 40 to 60 years. RA is associated with decreased physical function, disability, underemployment, and overall diminished quality of life. Life expectancy is decreased by an average of 5 to 15 years.

Rheumatoid arthritis is a relatively novel Western disease. The British physician Sir Alfred Baring Garrod first coined the term “rheumatoid arthritis” in 1859, and the disease appears to have emerged in Europe during the 16th and 17th centuries, as evidenced by works of art and rudimentary medical descriptions. Because RA can be traced to Archaic Amerindians, one theory hypothesizes that RA achieved worldwide distribution after European settlers came in contact with Indian tribes, suggesting a possible infectious etiology of disease. However, this hypothesis has yet to be definitively substantiated. Genetic factors also are suggested by the observation of genetic concordance in monozygotic twins (15%–21%).

**CLINICAL FEATURES**

Rheumatoid arthritis is a chronic systemic inflammatory disease with a wide spectrum of disease severity. Symptoms may range from diffuse swelling of the hands or symptoms of carpal tunnel syndrome to severe obvious synovitis and deformity. Physical features of the hands may include bilateral synovitis of the metacarpophalangeal and proximal interphalangeal joints, wasting of the dorsal interossei muscles, joint subluxation, and ulnar deviation. Physical features of the feet may include hammertoe deformities and lateral deviation.

As summarized in the Table, RA has many clinical features and specific American College of Rheumatology diagnostic criteria. It tends to be a symmetrical disease, affecting more than 3 joints (polyarticular) and is often associated with morning stiffness lasting 1 hour or more. RA also can be associated with extra-articular manifestations.

**DIAGNOSIS AND DISEASE STAGING**

Although rheumatoid factor (RF) is the most commonly available blood test for RA, less than 50% of patients test RF positive in the first 6 months of diagnosis. Once disease is established, 85% of patients can be RF positive. However, RF is not specific for RA and also may be positive with other conditions, such as infections (eg, hepatitis C) and malignancy.

Testing for antibodies to cyclic citrullinated peptide (anti-CCP antibodies) is newer than RF testing and is associated with higher sensitivity and specificity for RA. Anti-CCP antibodies may be detected before RF develops and are found in up to 40% of RF-negative patients. It tends to be predictive of erosive disease and joint damage.

Radiographic changes may present initially as periarticular osteopenia, followed by cartilage loss and joint space narrowing, and finally result in erosions of the bone. Magnetic resonance imaging and ultrasound evaluations are more sensitive than plain radiographs in the detection of bony erosions and joint synovitis, thereby facilitating earlier diagnosis of RA.

**Table. Characteristics of Rheumatoid Arthritis**

<table>
<thead>
<tr>
<th><strong>Clinical:</strong></th>
<th><strong>Musculoskeletal:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Female &gt; male</td>
<td>* Symmetrical</td>
</tr>
<tr>
<td>Morning stiffness &gt; 1 hour</td>
<td>* Polyarticular</td>
</tr>
<tr>
<td>Fatigue</td>
<td>* Joint involvement:</td>
</tr>
<tr>
<td>Fever</td>
<td>metacarpophalangeal, proximal interphalangeal joints, metatarsophalangeal, and wrists</td>
</tr>
<tr>
<td>*Rheumatoid factor</td>
<td>Affects cervical spine</td>
</tr>
<tr>
<td>Anti-CCP antibodies</td>
<td>Spares thoracolumbar spine</td>
</tr>
<tr>
<td>Inflammatory markers: ESR and CRP level</td>
<td><strong>Radiographic:</strong></td>
</tr>
<tr>
<td>*Erosions</td>
<td><strong>Extra-articular:</strong></td>
</tr>
<tr>
<td>*Periarticular osteopenia</td>
<td>Cardiovascular disease (atherosclerosis)</td>
</tr>
<tr>
<td>Joint space loss</td>
<td>* Rheumatoid nodules</td>
</tr>
<tr>
<td></td>
<td>Cutaneous vasculitis</td>
</tr>
<tr>
<td></td>
<td>Ophthalmic iritis</td>
</tr>
<tr>
<td></td>
<td>Pulmonary fibrosis and nodules</td>
</tr>
<tr>
<td></td>
<td>Renal manifestations</td>
</tr>
<tr>
<td></td>
<td>(AA amyloidosis)</td>
</tr>
<tr>
<td></td>
<td>Sicca symptoms (dry eyes and mouth)</td>
</tr>
<tr>
<td></td>
<td>Hematologic (anemia of chronic disease and Felty’s syndrome)</td>
</tr>
<tr>
<td></td>
<td>Osteoporosis</td>
</tr>
</tbody>
</table>

*American College of Rheumatology Criteria: 24 criteria with symptoms for 26 weeks. AA = amyloid A; CRP = C-reactive protein; CCP = cyclic citrullinated peptide; ESR = erythrocyte sedimentation rate. Data from American College of Rheumatology Subcommittee on Rheumatoid Arthritis Guidelines.*
Although the clinical course or patterns of disease progression may vary among individual patients, the majority of patients fall into the progressive category, type 3 (Figure 1). Only a minority of patients (5%-20%) will present with type 1 progression (self-limiting disease that enters into remission after the first year of diagnosis). Although RA progresses throughout a patient’s lifetime, the rate of progression is greatest during the first 2 years after diagnosis, because 67% of patients will have joint space narrowing or erosions by the end of the second year. The first year post-diagnosis is particularly crucial for medical intervention to slow the rate of progression and to avoid future joint destruction.

**Complications and Extra-articular Manifestations**

Poor prognostic factors for RA include polyarticular disease; systemic extra-articular manifestations; persistent or refractory disease activity associated with elevated inflammatory markers (eg, erythrocyte sedimentation rate or C-reactive protein), RF, and anti-CCP antibody positivity; and the presence of the shared isotope chain on human leukocyte antigen-DR alleles. These factors are indicative of poor patient outcomes, in addition to a possible lack of complete response to treatment.

Rheumatoid arthritis can be associated with several extra-articular manifestations (Table), some of which may decrease life expectancy by roughly 10 years in women and 4 years in men. Cardiovascular morbidity and mortality is increased. The risks for malignancy (specifically lymphoproliferative disorders), serious infections, lung disease, and gastrointestinal bleeding also are increased, and this can be disease- or treatment-related.

**Pathogenesis and Pathology**

Although the factors responsible for disease initiation, susceptibility, and acceleration have not been identified, these factors trigger an immune response that leads to joint inflammation, damage, and destruction. In turn, this joint inflammation, damage, and destruction amplifies the immune response, propagating the disease process and leading to further joint damage and destruction.

The integrated immune response is complex and requires the interaction of multiple inflammatory cells (Figure 2). Antigen-presenting cells and T cells interact with B cells and plasma cells. Macrophages...
lead to secretion of cytokines, antibodies, RF, and anti-CCP antibodies. Histopathologic changes in the RA synovium occur, including edema with infiltration of T cells, B cells, and macrophages. Pannus formation, or inflammatory granulation tissue that erodes into adjacent cartilage and bone, ultimately leads to joint destruction.\(^{17}\) The immune response involved in RA pathogenesis can now be targeted by new pharmacotherapy. An example is the use of biologic agents against tumor necrosis factor-\(\alpha\) (TNF-\(\alpha\)) that emerged in the late 1990s. As research further clarifies the role of immune cells and factors (eg, TNF-\(\alpha\) and interleukins [IL-1 and IL-6]) in the pathogenesis, further advances in RA treatment are likely.

**Disease Impact**

Rheumatoid arthritis may be described as the disorder of the 3 “Ds”: deformity, disability, and depression. Within 10 years of diagnosis, 30% of patients with RA will be completely disabled. The average annual medical cost per patient is roughly $6000, and total lifetime direct medical cost is estimated to be $93 000.\(^{18,19}\)

In a recent study, health-related quality of life (HRQOL) was compared between patients with RA and the general population, using the health survey questionnaire SF-36.\(^{20}\) The study found that HRQOL was decreased (on all scales of the SF-36) in all patients with RA, regardless of gender and age. One year of RA duration represented a disease burden of 14 to 20 quality-adjusted life-years per 100 patients with RA. The study concluded that RA causes substantial disease burden, predominantly affecting physical function and causing significant social and psychological consequences.

In another recent investigation, researchers used another questionnaire to compare the perceptions of RA among patients, family members, and physicians.\(^{21}\) Of the 7702 usable surveys, perceptions among the 3 groups were in overall agreement. Patients described their joint pain as variable (80%) and unpredictable (68%). They also reported a need to push themselves (86%), frustration (86%), anxiety about disease progression (89%), and anxiety about prevention from making plans for the future (6%). A negative impact was reported on recreational activities (84%), work (56%), and family life, including sexuality (51%). The study underscored the major physical impact of RA in addition to its striking psychosocial effects.

**Multidisciplinary Patient Care**

As emerging therapies continue to show promise in disease control, a multidisciplinary approach is becoming necessary to optimize management of patients with RA. Goals of management should include early disease screening and recognition, timely therapy, appropriate monitoring, control of signs and symptoms of disease progression, improved physical and psychosocial functioning, and patient education to self-manage therapies and empower decisions. Particularly in the outpatient clinic setting, infusion protocols can provide guidelines for therapy decisions and procedures to prevent and manage infusion-related reactions. Accurate documentation by nurses in this setting is essential for providing insurance authorization for therapies, delineating plans of care, and communicating response to therapy and overall patient well-being with physicians.

Effective communication is critical in managing patients with RA. Effective communication between healthcare professionals and patients promotes a better understanding of therapy, such as proper drug administration and potential drug benefits. Anticipation, detection, and management of potential side effects are also critical to providing proper and timely treatment. Patients should be aware of possible side effects and should understand the potential positive and negative impact of these therapies on their quality of life. Among the healthcare team, effective communication is necessary for side effect monitoring and management, recognition and communication of adverse effects, evaluation of patient and family educational needs, and consideration of patient physical and psychological needs.

**Conclusions**

Rheumatoid arthritis is a major public health problem with profound physical, psychological, and economic consequences. Benefits of RA treatment include joint pain relief, symptom control, return of physical function, and maintenance of employment. In combination with improved diagnostic methods, early aggressive treatment may significantly improve patient outcomes. Early diagnosis and institution of early aggressive therapy are associated with a slower rate of disease progression and prevention of disease-related damage and destruction. The challenge of RA man-

---

**DISEASE IMPACT**

Rheumatoid arthritis may be described as the disorder of the 3 “Ds”: deformity, disability, and depression. Within 10 years of diagnosis, 30% of patients with RA will be completely disabled. The average annual medical cost per patient is roughly $6000, and total lifetime direct medical cost is estimated to be $93 000.\(^{18,19}\)

In a recent study, health-related quality of life (HRQOL) was compared between patients with RA and the general population, using the health survey questionnaire SF-36.\(^{20}\) The study found that HRQOL was decreased (on all scales of the SF-36) in all patients with RA, regardless of gender and age. One year of RA duration represented a disease burden of 14 to 20 quality-adjusted life-years per 100 patients with RA. The study concluded that RA causes substantial disease burden, predominantly affecting physical function and causing significant social and psychological consequences.

In another recent investigation, researchers used another questionnaire to compare the perceptions of RA among patients, family members, and physicians.\(^{21}\) Of the 7702 usable surveys, perceptions among the 3 groups were in overall agreement. Patients described their joint pain as variable (80%) and unpredictable (68%). They also reported a need to push themselves (86%), frustration (86%), anxiety about disease progression (89%), and anxiety about prevention from making plans for the future (6%). A negative impact was reported on recreational activities (84%), work (56%), and family life, including sexuality (51%). The study underscored the major physical impact of RA in addition to its striking psychosocial effects.

**MULTIDISCIPLINARY PATIENT CARE**

As emerging therapies continue to show promise in disease control, a multidisciplinary approach is becoming necessary to optimize management of patients with RA. Goals of management should include early disease screening and recognition, timely therapy, appropriate monitoring, control of signs and symptoms of disease progression, improved physical and psychosocial functioning, and patient education to self-manage therapies and empower decisions. Particularly in the outpatient clinic setting, infusion protocols can provide guidelines for therapy decisions and procedures to prevent and manage infusion-related reactions. Accurate documentation by nurses in this setting is essential for providing insurance authorization for therapies, delineating plans of care, and communicating response to therapy and overall patient well-being with physicians.

Effective communication is critical in managing patients with RA. Effective communication between healthcare professionals and patients promotes a better understanding of therapy, such as proper drug administration and potential drug benefits. Anticipation, detection, and management of potential side effects are also critical to providing proper and timely treatment. Patients should be aware of possible side effects and should understand the potential positive and negative impact of these therapies on their quality of life. Among the healthcare team, effective communication is necessary for side effect monitoring and management, recognition and communication of adverse effects, evaluation of patient and family educational needs, and consideration of patient physical and psychological needs.

**CONCLUSIONS**

Rheumatoid arthritis is a major public health problem with profound physical, psychological, and economic consequences. Benefits of RA treatment include joint pain relief, symptom control, return of physical function, and maintenance of employment. In combination with improved diagnostic methods, early aggressive treatment may significantly improve patient outcomes. Early diagnosis and institution of early aggressive therapy are associated with a slower rate of disease progression and prevention of disease-related damage and destruction. The challenge of RA man-

---

**DISEASE IMPACT**

Rheumatoid arthritis may be described as the disorder of the 3 “Ds”: deformity, disability, and depression. Within 10 years of diagnosis, 30% of patients with RA will be completely disabled. The average annual medical cost per patient is roughly $6000, and total lifetime direct medical cost is estimated to be $93 000.\(^{18,19}\)

In a recent study, health-related quality of life (HRQOL) was compared between patients with RA and the general population, using the health survey questionnaire SF-36.\(^{20}\) The study found that HRQOL was decreased (on all scales of the SF-36) in all patients with RA, regardless of gender and age. One year of RA duration represented a disease burden of 14 to 20 quality-adjusted life-years per 100 patients with RA. The study concluded that RA causes substantial disease burden, predominantly affecting physical function and causing significant social and psychological consequences.

In another recent investigation, researchers used another questionnaire to compare the perceptions of RA among patients, family members, and physicians.\(^{21}\) Of the 7702 usable surveys, perceptions among the 3 groups were in overall agreement. Patients described their joint pain as variable (80%) and unpredictable (68%). They also reported a need to push themselves (86%), frustration (86%), anxiety about disease progression (89%), and anxiety about prevention from making plans for the future (6%). A negative impact was reported on recreational activities (84%), work (56%), and family life, including sexuality (51%). The study underscored the major physical impact of RA in addition to its striking psychosocial effects.

**MULTIDISCIPLINARY PATIENT CARE**

As emerging therapies continue to show promise in disease control, a multidisciplinary approach is becoming necessary to optimize management of patients with RA. Goals of management should include early disease screening and recognition, timely therapy, appropriate monitoring, control of signs and symptoms of disease progression, improved physical and psychosocial functioning, and patient education to self-manage therapies and empower decisions. Particularly in the outpatient clinic setting, infusion protocols can provide guidelines for therapy decisions and procedures to prevent and manage infusion-related reactions. Accurate documentation by nurses in this setting is essential for providing insurance authorization for therapies, delineating plans of care, and communicating response to therapy and overall patient well-being with physicians.

Effective communication is critical in managing patients with RA. Effective communication between healthcare professionals and patients promotes a better understanding of therapy, such as proper drug administration and potential drug benefits. Anticipation, detection, and management of potential side effects are also critical to providing proper and timely treatment. Patients should be aware of possible side effects and should understand the potential positive and negative impact of these therapies on their quality of life. Among the healthcare team, effective communication is necessary for side effect monitoring and management, recognition and communication of adverse effects, evaluation of patient and family educational needs, and consideration of patient physical and psychological needs.

**CONCLUSIONS**

Rheumatoid arthritis is a major public health problem with profound physical, psychological, and economic consequences. Benefits of RA treatment include joint pain relief, symptom control, return of physical function, and maintenance of employment. In combination with improved diagnostic methods, early aggressive treatment may significantly improve patient outcomes. Early diagnosis and institution of early aggressive therapy are associated with a slower rate of disease progression and prevention of disease-related damage and destruction. The challenge of RA man-
management is to balance the risk of therapy with the benefits of treatment. In the management of RA, nurses play a critical role as part of a multidisciplinary healthcare team that can administer successful therapy and achieve positive patient outcomes.

**DISCUSSION**

**Ms Ruffing:** In terms of clinical course of the disease with type 3 being the most progressive, is this without treatment?

**Dr Saleh:** Yes, without treatment.

**Ms Dexter:** Does age play any factor in disease progression?

**Dr Saleh:** To my knowledge, there is no definitive evidence to suggest that it plays a significant role in disease progression.

**Ms Ruffing:** It is interesting that such a high percentage of patients report the need to push themselves and their anxieties about disease progression, especially concerning disease impact on future plans. The outpatient infusion nurse has an important role in addressing these concerns during patients’ routine visits.

**Ms Dilliar d:** You are correct, especially during longer infusions because this is when many patients bring up their concerns. Patients seem more at ease talking to their infusion nurses versus their physicians and may ask questions such as “Is this going to go away?” or “Do I have to do this for the rest of my life?” In addition to counseling, infusion nurses have the opportunity to listen and to understand whether patients are responding to therapy. As Dr Saleh discussed, early aggressive treatment can control disease, and it is important to evaluate RA therapy. As new biologic agents emerge, the pros and cons of each should be understood, and patient response will differ among agents. Research is now trying to tailor treatments to individual patients through identification of pro-inflammatory cytokines using techniques, such as genetic testing of the pannus.22 Unfortunately, medication cost, not research, is currently driving treatment decisions. Nurses must really listen to patients and speak to physicians in order to determine response to therapy and if dose adjustments or medication changes are necessary to prevent future disability and deformity.

**Ms Neuberger:** A new article in the most current issue of *Arthritis & Rheumatism* reports estimated rheumatic disease prevalence as per The National Arthritis Data Workgroup, a consortium comprised of experts from the Centers for Disease Control and Prevention, the National Institutes of Health, and the Department of Veterans Affairs.23 This workgroup recognized the difficulty in determining accurate prevalence estimates for RA and other rheumatic conditions, so the group used several sources and extrapolation methods to provide the best available prevalence estimates for the United States. Interestingly, the group found RA prevalence has decreased since 1995, from 2.1 million to 1.3 million adults currently. Another interesting observation is that the incidence appears to be decreasing in younger adults whereas the average age of patients with RA is increasing. Despite the overall decrease in prevalence, the workgroup estimates that RA-associated morbidity, mortality, and disability will increase because people are living longer.

**Dr Saleh:** These interesting findings may support the theory that RA may have been triggered by an infectious process, resulting in an epidemic that is now on the decline. In general, it appears that multiple factors contribute to RA prevalence.

**Ms Daul:** I recently read an article that discusses the role of B cells in T-cell activation and synovial joint infiltration resulting in TNF-α and IL-6 production and stimulation of fibroblasts to release destructive enzymes. Even though I can explain to patients the mechanism of drug action, I cannot explain the exact mechanism of disease pathogenesis. Could you clarify what we know about antigen presentation and B-cell and T-cell communication?

**Dr Saleh:** RA pathogenesis is a complex and highly integrated process, with multiple immune cells and cytokines at play, leading to the inflammatory cascade. Although RA was previously considered to be a predominantly B cell-mediated disease, we now understand that B cell-T cell interaction is crucial to disease pathogenesis. Disease propagation with joint inflammation and destruction seems to result through the interaction of multiple inflammatory cells, including B cells, T cells, and macrophages.

**REFERENCES**
