

# The Role of Psychological Stress in Rheumatoid Arthritis

*Psychological stress affects the immune system, and stress is linked to disease onset and exacerbation in the rheumatoid arthritic patient. Stress may precede the onset of disease flare-ups. Adult health and advanced practice nurses should focus on assessing patients for symptoms of stress, identifying methods of coping when faced with stress, and implementing a variety of stress-reduction techniques.*

The relationship of psychological stress to the onset and perpetuation of rheumatoid arthritis (RA) has been an area of interest to many researchers (Rubin & Hawker, 1993). Stress may initiate the pathophysiological response in the arthritic patient, predispose a patient to develop rheumatoid arthritis, or exacerbate the initial pathophysiology (Anderson, Bradley, Young, McDaniel, & Wise, 1985). Major and minor life events can be causative agents of both the development and exacerbation of RA. Not only is stress linked to lymphocyte alterations (Zautra et al., 1989), but also to acute flare-ups of the disease (Affleck, Pfeiffer, Tennen, & Fifield, 1987). Additionally, the psychologic coping mechanisms of the RA patient in response to stress have been studied in relationship to disease status (Rimon & Laasko, 1985). The purpose of this review article is to investigate the role that stress may play in disease onset and activity, as well as to explore ways in which adult health and advanced practice nurses may assist the RA patient in coping with life stress.

## Pathophysiology

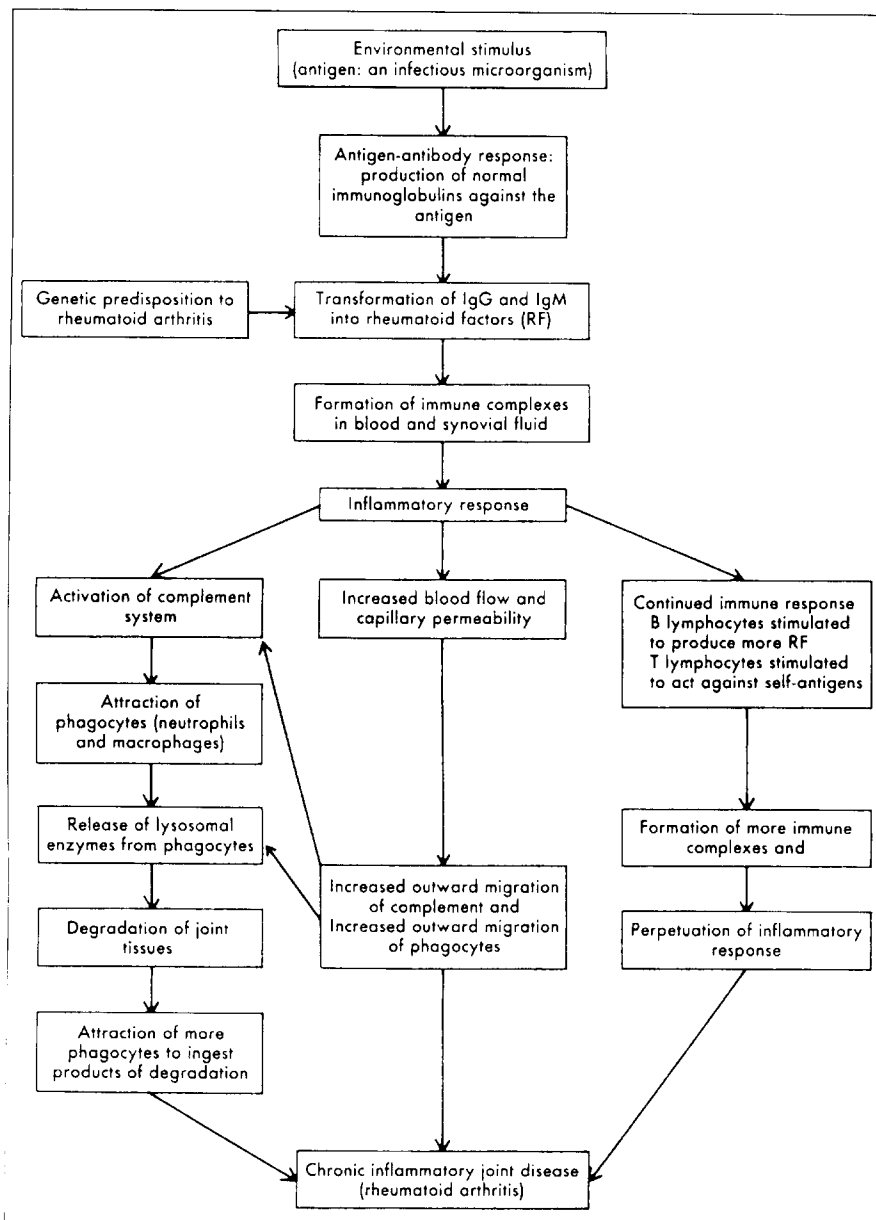
Rheumatoid arthritis is a chronic systemic connective tissue disorder characterized by inflammation in joint tissue (Koffler, 1985) (see Figure 1). In RA, tissue injury is mediated by destructive action on the synovial membrane by immune complexes made up of rheumatoid factors bound to immunoglobulins. The action that initially triggers the appearance and production of these antibodies is unknown; however, there are several etiologic theories. A number of factors including a viral or bacterial microorganism, genetic predisposition, hormonal aspects, and stress have been postulated as causal agents (Koffler, 1985). These complexes in turn become bound with complement proteins in the synovial fluid and activate the complement system or antigen-antibody response. Inflammatory cells such as polymorphonuclear cells increase in the joint space and phagocytize the immune complexes (McCance & Huether, 1994). This results in the release of powerful lysosomal enzymes which act upon the synovial membrane, destroying the connective tissue. Histamine, bradykinin, and serotonin released from the injured tissues trigger vasodilation and vessel permeability (McCance & Huether, 1994).

As the process continues, synovial villi become hypertrophic and infiltrated with numerous inflammatory cells. This chronic inflammation results in thickening of the synovium, called pannus formation (Koffler,

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**Figure 1. Probable Pathogenesis of Rheumatoid Arthritis**



*Pathophysiology: The biologic basis for disease in adults and children* (2nd ed.) (p. 1464), by K.L. McCance and S.E. Huether, 1994, St. Louis, MO: Mosby-Year Book, Inc. Reprinted with permission.

1985). Pannus adheres to the cartilage and acts almost like neoplastic tissue, eating into the underlying soft tissue, cartilage, and bone. As the disease progresses, muscle wasting and atrophy occur secondary to disuse as well as joint deformity. If there is no intervening therapy, the involved joint is eventually destroyed.

### Stress and the Immune System

Stress is defined as "a state of

disharmony or threatened homeostasis" (Sternberg, Chrousos, Wilder, & Gold, 1992, p. 855). Adaptive responses can be stressor specific, or nonspecific. Nonspecific stress responses usually occur only if the magnitude of the actual or perceived threat to homeostasis exceeds a certain threshold (Sternberg et al., 1992). An individual's response to stress may itself act as a stressor that is capable of producing pathologic changes. It has been hypothesized that disruptions in the feedback

loop of the stress response and the immune system over a continuum could alter inflammatory disease activity and could further explain exacerbations and remissions associated with RA disease activity (Sternberg et al., 1992). It also has been postulated that inadequate or excessive cortisol production may result in inadequate or excessive cortisol availability and a tendency toward inflammation in the RA patient (Dantzer & Kelley, 1989).

The relationship that exists between stress, psychological well-being, and the immune system must not be overlooked. As Anderson et al. (1985) indicate, increased stress and decreased psychologic well-being can lead to an increased incidence in the development of illnesses brought on by alterations in immune functions. This occurs because stress can increase physiologic responses, such as the production of adrenal cortical and adrenal medullary hormones (Doswell, 1989). The increased levels of corticosteroids can result in a decreased immunologic response which can lead to a lowered body resistance and an increased susceptibility toward developing infections (Salmond, 1989).

Stress can also change the activities of lymphocytes and macrophages (Palm et al., 1992; Zautra et al., 1989). Dantzer and Kelley (1989) believed that stress could suppress T-cells in RA and lead to more active disease. Antigen-activated T-cell multiplication has long been associated with the lymphokine IL-2's role in the immune response (Harrington et al., 1993). In a breakthrough study, Harrington et al. (1993) demonstrated a correlation between increased IL-2 levels and inflammatory activity in the joints. Additionally, a decline in IL-2 levels was significantly correlated with psychological stress. In a study by Palm et al. (1992), 18 RA patients were subjected to 60 minutes of psychological stress testing. Results indicated that leukocytes and lymphocytes increased significantly after being subjected to stress.

## Psychological Stress and Rheumatoid Arthritis

There are numerous contradictions in the research studying the construct of psychological stress and its effects on disease. Assessments of stress have included various procedures such as identifying certain events or situations as stressful, the subjective estimates by patients as to the degree of stress they are experiencing, and clinical judgments of patients' level of stress. These differences among investigations in defining the construct of stress have clearly contributed to the difficulties in examining the role of stress in the development and exacerbation of RA. Other problems identified with respect to stress research in relation to RA include use of small sample sizes, absence of experimental controls, and ignorance of individual differences in stress coping (Anderson et al., 1985).

The role of psychological stress in provoking flare-ups and in ultimately leading to further disease progression has also been given much thought. A flare-up triggers vasodilation of the surrounding capillaries and arterioles and results in increased blood flow to the area as well as signs of redness and warmth. Flare-ups result in edema to the affected joint in addition to decreased joint mobility which causes the RA patient severe pain and disability (McCance & Huether, 1994). Affleck et al. (1987) identified stress as the cause most often implicated by RA patients as the reason for their flare-ups. However, Rubin and Hawker (1993) and Harrington et al. (1993) could not find a direct association between joint inflammation and stress.

### Major Life Events

Of the studies examining stress and RA, the majority seem to focus on the role of major stressors as predictors of disease onset and exacerbation. Major life events have been defined as such occurrences as marriage, divorce, or death of a significant other (see Table 1). A person's perception and interpretation of these stres-

sors may directly influence the degree of the stress response (Salmond, 1989). The response is further changed when circumstances such as the person's age, gender, and concurrent health status are added to the equation (Young, 1992). Zautra et al. (1989) examined the relationship between life-stress events, lymphocyte levels, and stress in 33 female RA patients. Stress levels were significantly correlated with increased levels of B cells and a relatively low level of T-helper and T-suppressor cell ratio; however, consistent evidence of an association between life stress and exacerbation of RA could not be determined. Thomason, Brantley, Jones, Dyer, and Morris (1992) also concluded that there was no association between major life events and RA disease activity.

Salmond (1989) contradicted these findings when she identified a positive link between major stressors and symptom exacerbation. Problems with children, marital crisis, and financial difficulties were all identified as stressors that preceded exacerbation of symptoms in RA patients. Rimon and Laasko (1985) supported these findings in a 15-year follow-up study of 100 RA patients when they concluded that RA symptom onset resulted from a major traumatic life event occurring in the year prior to disease onset.

### Minor Life Events

Several investigations have suggested that disease progression will result when subjected to small, chronic stressors of everyday life (Anderson et al., 1985; Crosby, 1988; DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982). The theory suggests that small chronic stressors, experienced every day in sufficient quantities, may place enough additional stress on a person who is already weakened due to chronic illness to precipitate an exacerbation of illness (Anderson et al., 1985). DeLongis et al. (1982) sampled 100 California residents to examine the relationship between the ongoing stresses of daily living, referred to as hassles, and health status. The results concluded that

**Table 1.**  
**Major Life Events**

- ▲ Marriage
- ▲ Divorce
- ▲ Birth of a child
- ▲ Death
- ▲ Loss of job
- ▲ Financial difficulties

minor stressors (for example, car trouble or arguing with a spouse) are more important in predicting illness than major stress. Highly intense and frequent hassles were associated with poor overall health status. When Thomason et al. (1992) applied this theory to 69 RA patients, minor stress was significantly correlated with inflammation. Crosby (1988) related similar results when 101 subjects with confirmed RA were assessed in relation to daily stress factors, emotional stress levels, and RA disease activity. Results indicated a statistically significant correlation between current emotional stress level and RA disease activity, as well as a positive correlation between the severity and number of minor stress factors experienced and emotional stress level.

### Behavioral Phenomena and Clinical Implications

The painful and disabling consequences of RA are accompanied by a variety of behavioral and affective changes (van Lankerveld, Naring, van der Stoak, van't Pad, & van de Putte, 1993). In a study by van Lankerveld et al. (1993), when RA patients were asked to report the stressors that most affected them as a result of their disease, dependence on others, limitations in activity, and pain were the three most important cited (see Table 2).

Physical symptoms interfere with the RA patient's ability to perform ADLs (Salmond, 1989). Otherwise simple tasks, such as brushing one's teeth, may not only be difficult but time consuming as well. Additionally, loss of a job and a shift in family roles may add to feelings of helplessness, failure, and incompetence. These patients

**Table 2.**  
**Stressors Identified by RA Patients**

|                             |
|-----------------------------|
| ▼ Dependence on others      |
| ▼ Inability to perform ADLs |
| ▼ Pain                      |
| ▼ Loss of job               |
| ▼ Limitation of activity    |
| ▼ Change in roles           |

**Table 3.**  
**Role of the Nurse in Management of the RA Patient**

|   |
|---|
| ▶ Education                             |
| ▶ Identify coping mechanisms            |
| ▶ Assess support systems                |
| ▶ Medication management                 |
| ▶ Instruct stress management techniques |

**Figure 2.**  
**Relaxation Training**

1. Sit quietly in a comfortable position.
2. Close your eyes.
3. Deeply relax all of your muscles, beginning at your feet and progressing up to your face. Keep them relaxed.
4. Breathe through your nose. Become aware of your breathing. As you breathe out, say the word "one" silently to yourself. Breathe easily and naturally.
5. Continue for 10 to 20 minutes. You may open your eyes to check the time, but do not use an alarm. When you finish, sit quietly for several minutes, at first with eyes closed and later with your eyes opened. Do not stand up for a few minutes.
6. Do not worry about whether you are successful in achieving a deep state of relaxation. Maintain a passive attitude and permit relaxation to occur at its own pace. When distracting thoughts occur, try to ignore them by not dwelling upon them and return to repeating "one." With practice the response should come with little effort.

Source: Benson, H., & Klipper, M.Z. (1976). *The relaxation response*. New York: Avon Books.

must now rely on others for help, which also adds to their psychological stress (Salmond, 1989). The physical stress of pain also cannot be separated from the psychological effects that accompany it. Pain may lead the RA patient to an impaired functional status, and ultimately to a state of depression (Young, 1992). Affleck et al. (1987) believed that pain among RA patients was the greatest psychological stress possible.

### Nursing Implications

The role of adult health and advanced practice nurses in the hospital, home, or clinic setting is multidimensional (see Table 3). First and foremost, a detailed physical as well as psychological assessment of RA patients are essential for the planning of continued care designed to meet the individual patient's needs. As the previous research has indicated, stress should not be dismissed as a cause of disease onset and exacerbation.

It is also imperative to obtain a list from patients of the stressors that they perceive to be the most important. By teaching that disease flares are controllable, these stressors may be considered man-

ageable. Thus, a sense of personal control over the entire disease process is invoked. As a result, coping strategies can then be identified by simply asking patients how they plan to deal with these situations, or how they have dealt with them in the past (Ignatavicius, 1987). Educating patients to verbalize their concerns, seek help when they need it, and to set realistic goals can provide them with active, as opposed to avoidant coping strategies (Salmond, 1989).

The nurse also must identify and assess patients' support systems. It also may be helpful to recognize the coping behaviors of patients' families. It may be necessary to educate family members about the nature of the disease and the variability of symptoms, so that they can better understand the reasons for mood fluctuation in patients with RA. Too often, patients simply assume that their family understands all of the aspects associated with their disease, and this can further add to their daily stressors. Absence of support is directly associated with psychological symptoms (Ignatavicius, 1987). The nurse can help facilitate social support by arranging for patients to become involved in the Arthritis Foundation or in hospital-based programs

specific to arthritics. In these groups RA patients not only share their feelings and individual experiences associated with the disease, but also learn coping strategies and pain management techniques to overcome acute exacerbations of the disease.

Adult health and advanced practice nurses also evaluate the effectiveness of pain medication for controlling the physical symptoms of the disease. In addition, the psychological stress associated with pain can be addressed by instructing patients in methods of stress management. Some techniques employed with previous success in RA patients include relaxation training and guided imagery (Wetherbee, 1994). Relaxation training helps patients maximize their energy level, and is an effective coping mechanism (see Figure 2) (Wetherbee, 1994). Guided imagery calls upon the mind to envision a pleasant place where the person feels relaxed, peaceful, and free of stress (see Figure 3) (Bulechek & McCloskey, 1992). Audiotapes are available to guide the patient on pleasant "mind" journeys and may be suggested by the nurse as a means of stress reduction.

Most importantly, the greatest stress experienced by RA patients involves concern over health-

**Figure 3.**  
**Guided Imagery**

1. Begin by breathing slowly and deeply.
2. Think of yourself in a place where you feel relaxed and at ease, such as your favorite vacation spot.
3. Create all the details in your mind such as the sights, sounds, smells, and colors of this special place. Most importantly, think of how you feel when you are experiencing this place.

related issues (Crosby, 1988). Nurses should carefully explain all procedures and test results to patients as well as make them active participants in their plan of care. Additionally, energy-saving tips such as arranging one's environment in an efficient manner and taking naps during the day can help alleviate the detrimental physical and emotional aspects associated with fatigue.

### Research Implications

Few studies have supported a direct link between stress and onset of or course of illness in RA patients. In addition, little attention has been given to identifying stressors perceived as detrimental by patients and how these stressors affect physical, psychological, and social well-being. Future research should focus on the association of stress and the clinical course of the disease. By employing the method of follow-up studies, as in the case of Rimon and Laasko (1985), identifying specific triggers or links of stress to RA may finally be identified. By conducting these types of studies, objective data such as measurement of cortisol, IL-2, and lymphocyte levels can be obtained. These data then can be compared with respect to periods of normal activity versus periods when persons are experiencing a minor or major stressful life event. Prospective investigations using larger sample sizes could help clarify the causal relationship between stress and disease activity. Additionally, the various methods of stress reduction should be investigated to determine which is most effective in alleviating psychological stress in RA patients. By comparing these objective data with subjective data, the relationship

between psychological stress and rheumatoid arthritis finally may be understood. ■

### References

- Affleck, G., Pfeiffer, C., Tennen, H., & Field, J. (1987). Attributional processes in rheumatoid arthritis patients. *Arthritis and Rheumatism*, 30(8), 927-931.
- Anderson, K.O., Bradley, L.A., Young, L.D., McDaniel, L.K., & Wise, C.M. (1985). Rheumatoid arthritis: Review of psychological factors related to etiology, effects, and treatments. *Psychological Bulletin*, 98(2), 358-387.
- Benson, H., & Klipper, M.Z. (1976). *The relaxation response*. New York: Avon Books.
- Bulechek, G.M., & McCloskey, J.C. (1992). *Nursing interventions* (2nd ed.). Philadelphia: Saunders.
- Crosby, L.J. (1988). Stress factors, emotional stress, and rheumatoid arthritis disease activity. *Journal of Advanced Nursing*, 13, 452-461.
- Dantzer, R., & Kelley, K.W. (1989). Stress and immunity: An integrated view of relationships between the brain and the immune system. *Life Sciences*, 44(26), 1995-2008.
- DeLongis, A., Coyne, J.C., Dakof, G., Folkman, S., & Lazarus, R.S. (1982). Relationship of daily hassles, uplifts, and major life events to health status. *Health Psychology*, 1(2), 119-136.
- Doswell, W.M. (1989). Physiological responses to stress. *Annual Review of Nursing Research*, 7, 51-69.
- Harrington, L., Affleck, G., Urrows, S., Tennen, H., Higgins, P., Zautra, A., & Hoffman, S. (1993). Temporal covariation of soluble interleukin-2 receptor levels, daily stress, and disease activity in rheumatoid arthritis. *Arthritis and Rheumatism*, 36(2), 199-203.
- Ignatavicius, D. D. (1987). Meeting the psychosocial needs of patients with rheumatoid arthritis. *Orthopaedic Nursing*, 6(3), 16-20.
- Koffler, D. (1985). The immunology of rheumatoid arthritis. *Clinical Symposia*, 31(4), 2-36.
- McCance, K.L., & Huether, S. E. (1994). *Pathophysiology: The biologic basis for disease in adults and children*. St. Louis: Mosby.
- Palm, S., Henrickson, H., Barth, J., Halaki, A., Ferstl, R., Tolk, J., Kirstein, R., & Kirch, W. (1992). Modulation of lymphocyte subsets due to psychological stress in patients with rheumatoid arthritis. *European Journal of Clinical Investigations*, 22(1), 26-29.
- Rimon, R., & Laasko, R. (1985). Life stress and rheumatoid arthritis. *Psychotherapy and Psychosomatics*, 43, 38-43.
- Rubin, L.A., & Hawker, G.A. (1993). Stress and the immune system: Preliminary observations in rheumatoid arthritis using an in vivo marker of immune activity. *Arthritis and Rheumatism*, 36(2), 204-206.
- Salmond, S.W. (1989). Stress and stressors in rheumatoid arthritis. *Journal of Advanced Nursing*, 1(4), 35-43.
- Sternberg, E.M., Chrousos, G.P., Wilder, R.L., & Gold, P.W. (1992). The stress response and the regulation of inflammatory disease. *Annals of Internal Medicine*, 117(10), 854-865.
- Thomason, B.T., Brantley, P.J., Jones, G.N., Dyer, H.R., & Morris, J.L. (1992). The relation between stress and disease activity in rheumatoid arthritis. *Journal of Behavioral Medicine*, 15(2), 215-220.
- van Lankveld, W., Naring, G., van der Stoak, C., van't Pad, P., & van de Putte, L. (1993). Stress caused by rheumatoid arthritis: Relation among subjective stressors of the disease, disease status, and well-being. *Journal of Behavioral Medicine*, 16(3), 309-321.
- Wetherbee, L.L. (1994). Caring for the client with rheumatoid arthritis. *Home Healthcare Nurse*, 12(1), 13-18.
- Young, L.D. (1992). Psychological factors in rheumatoid arthritis. *Journal of Consulting and Clinical Psychology*, 68(4), 619-627.
- Zautra, A.J., Okun, M.A., Robinson, S.E., Lee, D., Roth, S.H., & Emmanuel, J. (1989). Life stress and lymphocyte alterations among patients with rheumatoid arthritis. *Health Psychology*, 8(1), 1-14.

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