CE 1.5 CONTACT HOURS

Autoimmune disease: Cost-effective care

Effective management of autoimmune disease can positively impact rising healthcare costs.

By Marcia K. Julian, MSN, RN

There are more than 100 autoimmune diseases; in fact, after heart disease and cancer, autoimmune disease is the most common disease category and the leading cause of morbidity in American women.[1,2] In autoimmune disease, a disturbance occurs in which the immune system isn't able to distinguish between healthy tissue and disease-causing cells. An immune response is initiated, which can result in the destruction of healthy tissue, abnormal organ growth, and changes in organ function.[3] Autoimmune disease can affect almost any cell, tissue, or organ in the body. Most commonly, blood vessels, connective tissue, endocrine glands, joints, muscles, red blood cells, and the skin are affected.[3]

Some autoimmune diseases are organ specific, whereas others affect many organs and body systems. Common autoimmune diseases include rheumatoid arthritis (RA), multiple sclerosis (MS), systemic lupus erythematosus (SLE), thyroid disease (Hashimoto thyroiditis and Graves disease), type 1 diabetes, psoriasis, and inflammatory bowel disease (IBD).[2]

Autoimmune disease has a major impact on rising healthcare costs, as well as the quality of life for individuals with these diseases because there's no cure and they're burdened with a lifetime of ongoing medical treatment.[4] Nurse managers need be aware of the scope of autoimmune disease, and its associated risks, to be active participants in controlling rising healthcare costs and improving the quality of life for patients.

Breaking down autoimmune disease

The National Institutes of Health (NIH) estimates that 23.5 million people in the United States have an autoimmune disease, or 1 in 31 Americans.[1,4] The NIH estimate is based on epidemiologic studies of only 24 of the more than 100 autoimmune diseases.[1] For this reason, the American Autoimmune Related Diseases Association (AARDA) estimates that the number of people affected is much higher at 50 million Americans. The estimate by the AARDA is based on studies from the NIH and data collected by the National Coalition of Autoimmune Patient Groups.[1]

The vast majority of those affected by autoimmune disease

are women (75% to 85%).[1] This suggests that there's a hormonal component, and it's theorized that hormonal imbalances play a role in the development of autoimmune disease.[2] Research has shown that estrogen leads to an increase in the autoimmune response, with pregnancy acting as a trigger or causing remission in patients with autoimmune disease.[1] Interestingly, the estrogen-like substance estradiol has been shown to induce lupus-like symptoms in susceptible mice.[5]

It's important to note that it's possible for an individual to have more than one autoimmune disease at the same time. Also, multiple autoimmune diseases may occur in one family, which suggests a genetic component. It has been shown that certain autoimmune diseases occur more often in some races and ethnicities; for example, SLE occurs more often in Black and Hispanic individuals than in White patients.[4]

It's unknown exactly what triggers the abnormal immune response that occurs in autoimmune disease, however, there are several predisposing and precipitating factors.[6] Some of the known factors are genetics, defects in the immune system affecting T and B cells, tissue damage, gender, diet, exposure to toxins or chemicals, hormones, weight gain, and exposure to viral and bacterial infections.[6-8] Due to the increased prevalence of autoimmune diseases, much research is focused on the role of the environment in their development.[5]

Due to the chronic nature of autoimmune disease, treatment is focused on managing symptoms, replacing needed substances (such as thyroid hormone and insulin), and preventing flares by controlling the immune response. Because autoimmune disease results from an overactive immune system, immunosuppressant medications are used to control the immune response and reduce inflammation.[3] These medications are often used as maintenance therapy, as well as for flare-ups, and include both corticosteroids and nonsteroid drugs such as azathioprine, cyclophosphamide, mycophenolate, sirolimus, and tacrolimus.[3] By suppressing the immune response, these drugs help preserve organ function.[7]

Other medications that can be used to suppress the immune systems include chemotherapy agents, biotherapy drugs, antirejection medications, disease modifying antirheumatic drugs, and anti-TNF medications such as infliximab, adalimumab, and certolizumab pegol.[7,9] Chemotherapy agents and biotherapy drugs have been successful in slowing and, in some cases, reversing the autoimmune response.[2] An advantage of the newer medications is that they're able to selectively target the harmful autoimmune responses without the risks associated with agents that broadly reduce the immune response.[5]

In addition to medications to suppress the immune system, patients with autoimmune disease may require medication to treat other symptoms, such as medication for depression, spasticity (in MS), pain (in MS and RA), and sexual dysfunction. Patients with IBD may require treatment with antibiotics, proton pump inhibitors, antidiarrheal drugs, and anticholinergic antispasmodic medications.

Managing associated risks

Patients taking immunosuppressive medications need to be educated on the risks associated with these types of drugs. The risk of infection increases relative to the degree of immunosuppression. The immunosuppressed patient is at high risk for developing infections from common community-acquired and opportunistic pathogens.[10] Education should include teaching the patient the signs and symptoms of infection and instructions to seek care if he or she develops a temperature of 100.4° F (38° C) or higher. It's also important to recommend that the immunosuppressed patient be vaccinated against influenza and pneumonia.[10] (See *Table 1.*)

Risk of malignancy is another concern for the patient on immunosuppressive medication. Autoimmune disease increases the risk of malignancy and this risk is compounded by taking immunosuppressive medications.[11] An increase in both cutaneous and hematologic cancers has been shown in these patients. Lymphoid malignancies have been linked to SLE, RA, and Sjögren syndrome.[10] Yearly skin exams and other recommended cancer screening, such as Pap smears, colonoscopy after age 50, and mammograms, should be encouraged. Patients with autoimmune disease should also be aware that bone marrow suppression is common when taking certain immunosuppressive drugs. Frequent monitoring of the complete blood cell count is recommended and the medications should be discontinued when significant neutropenia occurs (absolute neutrophil count less than 1.5).

Increased cardiovascular risk shouldn't be overlooked in the patient on immunosuppressive therapy. Cardiovascular disease is the most common cause of morbidity and mortality in patients with autoimmune disease.[10] Women with SLE or RA are much more likely than women without these diseases to have a myocardial infarction. This is believed to be due to the chronic inflammatory state that occurs in autoimmune disease, as well as the

hyperglycemia and hyperlipidemia that may occur as the result of medications used to manage the disease. Patients, especially women, need to understand this risk and take steps to reduce their risk by avoiding smoking, maintaining a healthy weight, and keeping tight control of blood glucose and lipid levels.

Glucocorticoids, a type of corticosteroid commonly used in the treatment of autoimmune disease, have the potential to cause alterations in bone metabolism and blood glucose control, as well as ophthalmologic problems. The risk of altered bone metabolism in the patient taking corticosteroids places him or her at risk for developing osteoporosis and the associated fractures that can occur. There's a rapid decline in bone mineral density within the first 3 months of taking a steroid medication. Many patients taking steroids aren't adequately educated on this risk factor and don't initiate interventions to prevent the development of osteoporosis. Guidelines have been developed by the American College of Rheumatology that recommend counseling the patient on lifestyle modification to include weight-bearing exercise. The patient should also be instructed on smoking cessation, avoiding excessive alcohol, and adding nutritional vitamin D supplements. The patient should have a baseline vitamin D level and height assessment.[12]

The patient should be educated regarding adequate amounts of calcium and vitamin D from food sources and supplements if necessary. The recommended calcium intake per day is 1,200 to 1,500 mg. Vitamin D supplementation, 800 to 1,000 IU per day, is also recommended to achieve therapeutic levels. Glucocorticoids can interfere with vitamin D metabolism and high-dose supplementation may be required.[13] Bone screening should be done regularly (every 1 to 2 years), as well as yearly optometry exams.[13]

Glucocorticoids are known to induce diabetes or worsen hyperglycemia in patients with preexisting diabetes in both short- and long-term courses of treatment.[14] The exact incidence is unknown, however, studies have shown patterns of increased blood glucose in many diseases that are treated with glucocorticoids.[15] This is believed to be related to an increase in insulin resistance.[15] When corticosteroid therapy is initiated, a baseline blood glucose level should be obtained and then rechecked each week for the first month of therapy.[16]

Nurses need to educate patients on the signs and symptoms of diabetes, such as increased thirst and urination, when they start therapy with glucocorticoids. It's recommended that glucose levels are checked later in the day because this is when glucocorticoids that are often given in the morning will most likely affect glucose levels.[15] A nonfasting blood glucose level of greater than 200 mg/dL and symptoms of hyperglycemia are needed for a diagnosis of diabetes, according to the American Diabetes Association.[15]

Table 1: Reducing the risks associated with autoimmune disease

Risk of infection	• Educate patients on the signs and symptoms of infection. • Teach patients to report any temperature greater than 100.4° F (38° C) to their healthcare provider. • Advise patients to avoid crowds. • Encourage patients to practice proper hand hygiene. • Recommend influenza and pneumonia vaccinations.
Risk of malignancy	• Advise patients to get recommended cancer screenings. • Monitor complete blood cell count for changes.
Cardiovascular risk	• Promote smoking cessation. • Encourage patients to maintain a healthy weight. • Educate patients about a heart-healthy diet. • Encourage regular exercise. • Monitor blood glucose levels. • Monitor lipid levels.
Risk of osteoporosis/ fractures	• Encourage an exercise program that includes weight-bearing exercise. • Educate about smoking cessation. • Advise patients to avoid excessive alcohol intake. • Recommend vitamin D supplements (800 to 1,000 IU/day). • Obtain a baseline vitamin D level. • Obtain a baseline height assessment. • Recommend calcium supplements (1,200 to 1,500 mg/day). • Encourage bone density screening.
Risk of hyperglycemia	• Educate patients on the signs and symptoms of hyperglycemia. • Monitor blood glucose levels. • Recommend a regular exercise program. • Educate patients about a carbohydrate-consistent diet.
Risk of falls/injury	• Identify patients at risk for falls or injury. • Recommend physical/occupational therapy. • Encourage the use of assistive devices.

When symptoms aren't present, a hemoglobin A1C, fasting blood glucose, or glucose tolerance test may be used for diagnosis.[15] Diet and exercise are recommended for the management of diabetes; however, in the patient with autoimmune disease, this may be difficult to achieve due to mobility limitations.

Nurses play an important role in managing the risks associated with autoimmune disease. In addition to the risk of infection that's most often associated with autoimmune disease due to the suppression of natural immunity that occurs with long-term immunosuppressive therapy, there are other risks to consider. Patients with certain autoimmune diseases, such as RA and MS, have an increased risk of injury and falls due to functional limitations associated with the disease processes. In the case of RA, there's joint erosion that can lead to a decline in functional ability.[17] The added risk of bone loss that often occurs with corticosteroids can compound this risk. The first step in the management of these risks is to identify patients at high risk. Nurses also need to be vigilant in assessing medication compliance in patients who've started pharmacologic intervention for low bone density.

Providing cost-effective care

The price of an autoimmune disease can be overwhelming for the patient due to the cost of medications and lab screenings. The initial costs of autoimmune disease are especially high because diagnosis is often difficult and may require multiple physicians and specialists.[1] It's expected that these costs will continue to rise due to the aging American population and the increasing incidence of autoimmune disease.[1,18] The financial burden of autoimmune disease falls on the patient, the healthcare system, and society.[13]

In 2001, the director of the National Institute of Allergy and Infectious Diseases estimated that the cost of treatment for autoimmune disease is greater than $100 billion annually. The AARDA estimates the cost at between $51.8 and $70.6 billion each year based on studies of just seven of the more than 100 autoimmune diseases. Type 1 diabetes also costs Medicare more than $2 billion each year just for renal dialysis. And the annual cost of treating RA in the United States is $10.9 billion in direct costs and $8.4 billion in indirect costs.[18]

Patients with autoimmune disease don't always get the care they need. A study conducted in 2008 found that American patients with chronic diseases are more likely than those in other countries to go without care due to the costs.[1] The direct costs include those incurred for inpatient, outpatient, and emergency care. There are also many indirect costs, such as loss of workplace productivity, as well as intangible costs, such as pain, to consider.[13]

Many people with autoimmune disease have higher rates of absenteeism from work and experience what's known as presenteeism (reduced work performance). Many may eventually find it difficult to maintain employment. The results of a study of patients with RA showed that they missed an average of 7.92 work days per year compared with individuals without RA who missed only 4.34 days each year.[14] Pain, fatigue, and functional disability in patients with RA can lead to disability.

The cost of caring for patients with autoimmune disease has gained interest because it accounts for a significant portion of healthcare spending. It's hypothesized that this is due to lack of care coordination and lack of diagnostic test standardization.[19] Increased awareness of the financial burden of autoimmune disease has increased the urgency of controlling these costs.[13] It's important that a diagnosis is made early and treatment started before complications occur. Early diagnosis is complicated by the fact that autoimmune diseases have vague symptoms and are difficult to diagnose.

Many physicians have limited specific training in autoimmune disease and patients may see many different physicians over a period of years before a diagnosis is made. The nurse can facilitate early diagnosis by educating patients to report a family history of autoimmune disease to their healthcare provider. Increased awareness that there's a genetic component can facilitate an earlier diagnosis, which may minimize or prevent complications such as damage to organs and loss of mobility. Assisting patients to prevent flare-ups by adhering to maintenance medication regimens and educating them about how to recognize early complications are additional ways to reduce the financial burden of autoimmune disease.

Increase quality of life, decrease costs

Autoimmune disease encompasses a spectrum of disorders that affects millions of people worldwide, and the number of people diagnosed with autoimmune disease is expected to increase. There are many direct and indirect costs associated with having an autoimmune disease. Early diagnosis is essential to preventing damage to organs and complications that negatively impact quality of life. Nurses play an important role in educating patients on effective ways to manage their disease and prevent complications. Effective management has the potential to decrease the increasing healthcare expenditures related to autoimmune disease. NM

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