CONTEXTUAL LEARNING
FOR PREMEDICAL STUDENTS

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INTRODUCTION

Contextual learning for premedical students was created to provide learning opportunities not normally available to undergraduate students. Premedical students often search for ways to gain experience in the medical field prior to entering medical school. The contextual study of systemic lupus erythematosus has given the students the opportunity to study a disease in many of its aspects. Sources of information for the study ranged from literature to patients and physicians. The multitude of sources provided knowledge not only of lupus, but of the medical profession as well.

The contextual study of systemic lupus erythematosus began with a conversation between the senior author and a former middle school science teacher. The teacher remembered the author’s research interest in the response of the immune system to cancer cells. She mentioned the surprisingly high number of cases of lupus in her home town, the rural community of Monticello, Florida.

At the Monticello Family Medicine clinic, there was a reported ten cases out of a population between 6,000-8,000 people. The authors eventually discovered from
 Numerous sources that the incidence was within range (which varies from source to source, but is around 14.6-50.8 cases/100,000 people, depending on the population tested). The complexity of lupus provided a challenge that would incorporate numerous possibilities. Sources ranged from textbooks, journal articles, and use of the Internet to speaking with lupus patients and the physicians who treat these patients.

**SYSTEMIC LUPUS ERYTHEMATOSUS**

Systemic lupus erythematosus is an autoimmune disease with no known cause. Persons with the disease form antibodies against their own tissues. A normal antibody recognizes foreign substances in the body and forms immune complexes which are removed from the body. With lupus, though, the body forms immune complexes with its own organs and tissues, thus attacking and destroying. These immune molecules are known as antinuclear antibodies (ANA) because they attack nuclear components of their own cells. The formation of the immune complexes results in swelling and scarring of tissues. These effects cause pain and discomfort associated with lupus.

Joint problems are a major complaint of many lupus patients. Swelling results in problems similar to rheumatoid arthritis. Many patients develop kidney problems when the immune complexes lead to scarring and eventual renal failure. Other symptoms include a "butterfly" rash on the face, fatigue, depression, and weight fluctuations. With the myriad of symptoms, lupus is often difficult to diagnose. A positive immunofluorescence ANA test that is specific for the antinuclear antibodies is in the diagnosis.

Lupus, as with most other autoimmune disorders, is more prevalent in women than in men. Women are 10-15 times more likely to develop lupus. Black women are at greatest risk, with Asian and white women following. There is a possible link between high estrogen level and lupus.

Interestingly, men with lupus typically exhibit a higher estrogen:testosterone level than men without lupus. Men with lupus usually have the discoid form of the disease. Discoid lupus appears as a red, raised rash which is often coin-shaped (hence, the name). This rash is often large and scarring. Women are more susceptible to systemic lupus which affects organ systems of the body. A third form of the disease is drug-induced. Drug-induced lupus is caused by some prescription drugs for hypertension and irregular heartbeats. The lupus symptoms subside once the medication is discontinued.

Treatment of the disease is as complex as the disease itself. The variety of drugs needed to treat the multiple symptoms all have some potential damage. Corticosteroids are commonly prescribed for treating internal changes caused by lupus by decreasing inflammation. Cytotoxic drugs are used in extreme cases when the patient fails to respond to corticosteroids. Rest and avoidance of sun are also highly recommended for patients.

**CONTEXTUAL LEARNING**

In the contextual study of lupus, many sources were used in gathering information, including books, journals, and patient files. With patient files, the issue of ethics in medicine and patient-physician confidentiality was pursued.
Following the above, interviews were conducted to obtain additional data. This phase of the study began with a discussion with a general practitioner at the Monticello Family Medicine clinic. He gave us an overview of the disease and explained what to look for on patient charts. He also explained that most lupus patients had to go to specialists for some of their symptoms. Another physician at the clinic introduced the authors to one of his patients. Interviews were also conducted with specialists in rheumatology, nephrology, and psychiatry, as well as with an immunology professor at Florida State University.

Patient involvement was a great benefit to the study. Written communication via questionnaires and verbal communication in interviews provided insights into the personal aspects of the disease. Often, lupus is not a visible disease, because many of its manifestations are internal. Patients shared their feelings with us about having the disease.

The authors also attended Lupus Foundation of America local meetings and met with people there. At the meetings, health professionals spoke about lupus-related topics based on their area of specialty. We had a chance to meet patients and to hear their questions.

THE PAPER SOURCES

Much has been written about lupus. Many books and journals provide information about the various aspects of lupus, including its history (Talbot, 1993), epidemiology and pathogenesis (Kotzin and O'Dell, 1995; Pollak and Pirani, 1993; Woods, 1993), symptoms (Schur, 1993), diagnosis and treatment (Hahn, 1993; Quismorio, 1993; Wallace, 1993; Wallace et. al., 1993), as well as the pathology of the disease (Dieppe et. al., 1986) and its many manifestations within the body. All sources agree that lupus is mysterious and unpredictable. No two people have exactly the same form of lupus. It cannot be determined prior to diagnosis which body systems will be affected. Only involvement of the kidney can possibly be ruled out. After diagnosis, if kidney involvement has not occurred within the first six months, the patient is unlikely to develop symptoms of renal failure.

A firm background of the disease was developed from written sources. Pictures in these books brought the images of rashes, scarring of organ systems, and joint inflammation (Dieppe et. al., 1986). Views within the body allowed us to "see" lupus as not possible from the outside.

The Internet was also a great source of information. The Lupus Home Page (1996) provided an overview of lupus, and a number of other web sites led to further learning. The Lupus Home Page revealed basics of the disease, including types and symptoms of lupus. It also identified the prevalence of the disease in women and associated disease "flare-ups" with menstruation. The home page was optimistic about the prognosis of the disease. Only in extreme cases was it identified as fatal, and new research continues to provide information for treatment and coping with the illness.

Patient files at the Monticello Family Medicine clinic were reviewed, and measures were taken to insure confidentiality. The importance of ethics in medicine became apparent and the relationship between doctor and patient were respected. Nine available patient files were examined—all females—which provided the first glimpse of how differently lupus affects people.

The authors traced the disease from symptoms to diagnosis in each patient. The course of treatment provided
for each patient was followed through the doctors' notes and the laboratory data. Each individual patient had a different pathway of symptoms and treatments. Often, months and years passed before an official diagnosis of lupus was made.

PHYSICIAN SOURCES

From the paper sources came sufficient information to form an intelligent basis for discussion with others, namely three specialty physicians. Each physician provided a background of the disease manifestation in the particular organ system. The doctors explained diagnosis and treatment of conditions.

One of the three, a rheumatologist in Tallahassee, had a number of lupus patients. He gave us a brief history of lupus and explained that it does not usually occur vertically within families; i.e., a child and her aunt may have the disease rather than a child and her mother, although the latter is possible. Joint involvement in lupus most often leads to symmetric polyarthritis of the small joints (hands and feet). Pain is caused by inflammation due to formation of the immune complexes in the joint area. Over-the-counter medications such as aspirin are recommended in mild cases, while corticosteroids are prescribed in more severe cases.

A second physician, a rheumatologist and expert in lupus from the University of Florida, gave a seminar at Florida State University at which he spoke about a particular antinuclear antibody specific for DNA. This anti-DNA antibody is found in patients with kidney involvement. He described an immunofluorescence test on kidney tissue, in which every nucleus fluoresced, indicating the presence of the antinuclear antibodies. The formation of the immune complexes causes extensive scarring and can lead to renal failure.

A nephrologist in Tallahassee provided additional information about kidney involvement in lupus patients. He explained that kidney involvement is rare in patients over 35-40. A biopsy aids in the diagnosis of the severity of the illness. Severe kidney involvement leads to renal failure when scarring damages the microscopic glomeruli, which are kidney filters needed to make proper urine. When filtering capability is decreased, substances essential to the body such as amino acids and glucose are lost in the urine while waste products are retained in the body. Dialysis is often used in cases of renal failure to increase the amount of quality urine excreted from the patient. He further explained that kidney transplants were occasionally an option. Immunosuppressive drugs are given to the patient to help prevent rejection of the transplanted organ. Lupus does not often reoccur to damage a transplanted kidney.

A psychiatrist in Tallahassee spoke to the authors about the emotional aspects of dealing with lupus. Although lupus is not always fatal, it is hardly curable. Symptoms may vary from day to day, and the pain can be tremendous. Pain, uncertainty, and fatigue often lead to depression. He indicated that most lupus-related depression sufferers have no history of depression. Antidepressants are often prescribed to control depression.

PATIENT SOURCES

Communication with lupus patients was initially handled through a questionnaire. The answers provided information about diagnosis and manifestations of lupus.
Two of the patients indicated that they were willing to meet with two of the authors about their experiences with lupus. All communication between the authors and the patient was through the physician.

Two female patients in their 50's were interviewed at the Monticello Clinic. Both were well educated about their condition. Self-awareness is touted to be important in coping with the disease, and these women demonstrated it. Each had years of symptoms before her diagnosis. The symptoms differed in each case, but both had multiple symptoms. Both agreed that stress worsened their symptoms.

Speaking with patients gave lupus a face. Seeing how patients coped with lupus provided insight into how it feels to have lupus. One of the patients introduced the authors to a book entitled "Living with Lupus" (Blau, 1993). Another guide for patients is by Wallace (Wallace, et. al., 1993). Understanding patients needs and feelings appears to be an enormous factor in caring for them.

LUPUS FOUNDATION OF AMERICA

The Lupus Foundation of America (LFA) has chapters which provide support services to individuals with lupus and for their families. LFA is a volunteer-driven nonprofit organization. In Tallahassee, it meets once a month from January to September. Guest speakers at the meetings discuss different aspects of lupus and effects of treatment, both good and bad. In October, which is lupus awareness month, the Tallahassee-Big Bend chapter conducts a large meeting with numerous speakers. LFA provides encouragement to patients by supporting each other and by recognizing literature sources dealing with living with lupus.

CONCLUSIONS

The study of lupus led through many pathways. The interweaving of sources built upon the complexity of the disease as the authors attempted to analyze and understand it. As we learned more, we became better able to explain it to others. The sources multiplied as one thing lead to another. A patient described a symptom and told us about her doctor and the treatment...the doctor explained the symptom and the treatment and suggested a journal...the journal led to further references...which led to more knowledge and more questions for the patients and the doctors.

Interest grows with the wealth of knowledge. Everything expands, and in this case, it all goes back to one relative point, lupus.

REFERENCES


