A Preliminary Study on The Diagnostic Criteria of Systemic Lupus Erythematosus Based on Computer

Jiangrong Chen¹,*

¹Department of Internal Medicine, Jiangxi Medical College, Jiangxi, China, 334000

*Corresponding author e-mail: jiangrooo@jxyxgz.edu.cn

Abstract. The lupus erythematosus described in this paper is a more common clinical disease, is an autoimmune disease, it has a disease in all kinds of people, and should be characterized as frequent. The pathogenesis and mechanism of this disease have the characteristics of diversification and differentiation, and the serum components of the patients are also quite complex, often accompanied by multiple organ diseases similar to other etiological symptoms, so it has strong concealment and misleading in clinical diagnosis. The failure to diagnose or misdiagnose the disease in time will bring great health risk and even life-threatening to the patients, so the diagnostic criteria are very important. In the experience summary and data accumulation of the diagnosis of systemic lupus erythematosus at home and abroad for decades, the author tries to combine the traditional diagnostic basis with computer technology to explore the optimal diagnostic criteria under new conditions.

Keywords: Computer, Lupus Erythematosus, Diagnosis

1. Introduction
Systemic lupus erythematosus is a kind of autoimmune disease with complicated pathology, various symptoms and multiple parts. It can cause serious damage to many organs of human body, thus reducing the health level and quality of life of the patients[1]. The diagnosis of atypical lupus erythematosus is a difficult task. Because the patient does not care about the condition, does not pay attention to, or because the hospital misdiagnoses, will cause the disease further spread and the treatment delay, the serious person may even crisis to the patient's life. To this end, with the help of many experts, scholars and medical organizations, many international academic organizations have developed diagnostic criteria for lupus erythematosus. So far, the widely accepted and used diagnostic criteria come from the American Rheumatology Society, which last revised the diagnostic criteria for lupus erythematosus in the 1990s. More than 20 years have passed. Many shortcomings of this diagnostic standard have been fully demonstrated in clinical application[2]. This article starts with the development and popularization of the diagnostic standard widely adopted in lupus erythematosus, and expounds the new standard and its formulation process in detail. In the era of more and more advanced computer technology, according to the actual clinical experience and accumulation, combined with computer technology and related software programs, the diagnostic criteria suitable for domestic cases are explored, and the diagnostic sensitivity and early diagnosis rate are improved. The following beneficial exploration is made.

2. Traditional diagnostic criteria for systemic lupus erythematosus

2.1. Brief description of diagnostic criteria
Discussion on the diagnostic criteria of lupus erythematosus has to be mentioned SLICC, this is an international organization composed of experts of clinical medical researchers, which has proposed a tool to determine the severity of the disease by injury index, which provides convenience for the diagnosis and treatment of lupus erythematosus. And the latest diagnostic criteria lupus erythematosus is also one of the hands of this organization, which has made great contributions to the clinical research and treatment of many diseases. Because of the various special manifestations of lupus erythematosus, the diagnostic criteria include two parts, one is to determine the derivation of the disease according to the clinical symptoms and the other is to verify the derivation according to the clinical observation and experimental data. The initial derivation process was as follows. 706 cases of continuous patients were provided by participating medical centers, including lupus erythematosus patients and controls. The controls were rheumatoid arthritis, myositis, chronic skin lupus and other autoimmune diseases easily confused with lupus erythematosus. Important clinical symptoms and immunological indexes were extracted from the medical records of patients. A total of 702 patients were diagnosed by consensus, more than 80% of the participants agreed on the diagnosis. Finally, these clinical symptoms and immunological indexes were screened and combined by extensive logical regression and decision tree analysis, and then refined and improved by recursive division, Produce preliminary diagnostic criteria. The standard is based on clinical data and is voted by international experts and scholars, but its sampling has some limitations, and its number is insufficient compared with the global population base.

2.2. Content of diagnostic criteria
At the international level ARA, the diagnostic criteria for lupus erythematosus can be traced back to the 1970s. It was originally used in clinical trials and investigation and research. The second revision of the diagnostic criteria was in the early 1980s, eliminating some of the symptoms that could not be considered as typical symptoms, and adding serum indicators, an important biological and technical indicator. Later in the late 1990s, the ACR made the last major revision to the diagnostic criteria so far, "lupus cell positive ", and changed "syphilis serological test false positive" to "anti-phospholipid antibody positive ". That is, increased anti-cardio-lipid antibody positive and lupus anticoagulant positive, this revision to the ACR Diagnostic treatment Committee consensus, without any validation. Just after the new century, some international famous medical experts have made little changes to the standard, which has greatly improved the sensitivity of the standard and reduced the correlation specificity.

2.3. Interpretation of diagnostic criteria for systemic lupus erythematosus
Due to the special pathological and clinical features of systemic lupus erythematosus, it is difficult to diagnose by clinical symptoms and serum sample tests, and the establishment of SLICC formal diagnostic criteria has lasted for more than eight years. The official version of the diagnostic criteria has also changed significantly compared with previous research test items. In order to avoid repeated calculations, the sensitivity of zygomatic erythema and light was combined into one item, and acute and sub-acute skin lupus was combined. Chronic skin lupus is independent, including disc erythema and other types of skin damage. In order to better use the new standard, suspected patients need to consult dermatology and, if necessary, skin biopsy. Arthritis was redefined to exclude diffuse pain caused by fibrous myalgia, joint line pain with morning stiffness for 30 minutes without film observation. Urine protein quantification was changed to random urine protein to creatinine ratio method, which increased the neurological symptoms in the diagnosis of nervous system damage. The diagnostic criteria of the blood system can be diagnosed only once. It is recommended that the reference value of leukopenia be redefined in some races. The most important changes in the formulation of formal standards are immunological related content. A variety of new antibodies are used as independent diagnostic criteria, and the detection methods of other antibodies have been changed. Others require more stringent detection of antibodies.
3. Immunological study of systemic lupus erythematosus

Because the disease belongs to autoimmune disease, immunological research accounts for a lot of weight in medicine. The new clinical diagnostic criteria, such as anti-ds-DNA antibody titer is at least laboratory standard, anti-Sm antibody is positive, ANA titer is higher than laboratory standard, lupus anticoagulant positive and so on, the diagnostic effect is good. Immunology accounts for more than 90% of the weight.

4. Criteria for differential diagnosis and evaluation of patients with systemic lupus erythematosus

In the diagnosis of systemic lupus erythematosus, it is necessary to compare and distinguish with many chronic diseases. Some symptoms of rheumatoid arthritis, psychosis, idiopathic thrombocytopenic purpura, primary glomerulonephritis, drug lupus, dermatitis and other diseases are similar to some symptoms of atypical lupus erythematosus. At the same time, doctors also need to analyze the degree of disease according to the patient's physical condition and symptom severity. The severity was followed by brain involvement, concomitant chronic diseases, renal lesions, rash and fever[5].

5. Computer-based diagnostic methods for systemic lupus erythematosus

5.1. Collection of clinical data on symptoms of lupus erythematosus

By collecting clinical data of lupus erythematosus patients through hospitals or medical associations and other relevant medical authorities, we can also collect relevant data from abroad, compare the collected data, find out the differences, and study them carefully. In a scientific and rigorous attitude, the collection of data samples is truly representative by combining medical theory with clinical practice. According to the collected medical data, the incidence of lupus erythematosus in women is 9.3 times higher than that in men, and the main population is between 25 and 30 years old. Family history is an important source of morbidity, accounting for about 12.5% of the incidence[6].

5.2. Computer data processing and data screening

The collected medical data are classified and screened by computer data processing technology. Before the data is input and processed, the age of onset is grouped in order to make the analysis results more accurate[7]. The clinical manifestations of lupus erythematosus patients in Table 1 were obtained.

| Symptoms | Elderly group (%) | Young group (%) |
|----------|-------------------|----------------|
| cheek    | 69                | 61             |
| Condition                                      | Count 1 | Count 2 |
|-----------------------------------------------|---------|---------|
| Hair loss                                     | 75      | 64      |
| Discussion erythema                           | 50      | 21      |
| Photosensitivity                              | 25      | 13      |
| Oral ulcers                                   | 6       | 16      |
| Reynolds phenomenon                           | 19      | 44      |
| Skin vasculitis                               | 0       | 20      |
| Arthritis and joint pain                      | 94      | 95      |
| Muscle pain                                   | 87      | 93      |
| Pulmonary fibrosis                            | 12      | 5       |
| Pleuritis or colorless inflammation           | 75      | 72      |
| Central nervous system involvement            | 19      | 48      |

5.3. Assessment of analytical results and determination of computer diagnostic criteria

Combined with the computer analysis results of tables 1 and 2 above, the analysis results are evaluated according to the medical principles and the experience of diagnosis and treatment of related diseases, and the weight of sub-effects is determined on the basis of following the medical principles. Develop computer diagnostic criteria and use computer programs. The computer diagnosis process is shown in figure 1.
6. Conclusion
SLICC the standard of lupus erythematosus established by this international organization accords with the actual pathogenesis and is effective in traditional diagnosis. On this basis, the introduction of computer technology to assist the diagnosis of the disease can greatly improve the accuracy of doctors' judgment of the disease, greatly improve the diagnostic accuracy of the disease, and make lupus erythematosus get early detection and treatment.

References
[1] Yang Jing. Development of diagnostic criteria for systemic lupus erythematosus [J].Journal of Kidney Disease and Dialysis Kidney Transplantation, 2013, 22(002):153-157.
[2] Li Yanqiu. Diagnostic criteria and treatment progress of systemic lupus erythematosus [J]. Qinghai Medical Journal, 2014(6):78-79.
[3] Guo Guimei, He Weixun. Diagnostic criteria and treatment progress of systemic lupus erythematosus [J]. Chinese Journal of practical Pediatrics, 30(013):978-982.
[4] Cui Dongbin, Xie Gang, Jiang Lan, et al. A preliminary study on the diagnostic criteria of systemic lupus erythematosus score by computer [J]. Journal of the Third Military Medical University, 1987(01):51-53 60 116-117.
[5] Jiang Ming. Advances in diagnosis and treatment of systemic lupus erythematosus [J]. Chinese Journal of Practical Internal Medicine, 2000, 020(001):55-57.
[6] Cao Mengyuan. Clinical analysis of hematological abnormalities in systemic lupus erythematosus [D]. Jilin University, 2006.
[7] Liu Shu, LIUShu. Diagnosis of SLE Journal of Clinical Medicine [J]. 1987, 17(3):143-144.