Prednisone Combined with Mycophenol Ester on Immune Function in Patients with Systemic Lupus Erythematosus

Yuchu Wang

School of Biomedicine, Guangdong University of Technology, Guangzhou, 510006, China

Email: 374133354qq.com

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Abstract: Systemic lupus erythematosus (SLE) is an autoimmune inflammatory connective tissue disease involving a variety of organs in the body. Its clinical manifestations include fatigue and weakness, fever, body quality decline, etc., which seriously affects the quality of life of patients. Prednisone, a glucocorticoid, is commonly used in the treatment of systemic lupus erythematosus. Mycophenol ester is an immunosuppressant commonly used in clinic and has been used to treat many autoimmune diseases in recent years. In order to observe the two drugs on the immune function of patients with lupus erythematosus (sle), the influence of joint? This paper observed the prednisone for 7 phenol ester renal function in patients with systemic lupus erythematosus (sle), the level of immune function and related factors, and changes in two groups of patients as research samples, in order to obtain the immune function of patients with situation of clinical evidence. The results showed that MMF combined with hormone had better effect on lymphocyte subsets than single hormone group, changes of immune cell subsets play an important role in the pathogenesis of SLE.

1. Introduction

Systemic lupus erythematosus (SLE) is an autoimmune systemic disease, the etiology of which is still not completely clear. The main reason is that due to the formation of autoimmune antibodies and multiple autoimmune compounds, the patient suffers from severe damage to multiple immune organs and other tissues throughout the body, and the disease is complex and changeable [1-2]. The research results showed that the main cause of the failure of the pathogenic autoimmunity antibodies was likely to be related to the decrease in the number of inhibitory lymphocytes and the decrease in the immune function of inhibitory leukocytes [3-4].

Huaheng Xu was designed to determine the frequency of circulating follicular helper T (Tfh) cells in patients with systemic lupus erythematosus (SLE) and to investigate the relationship between Tfh cells and the production of autoantibodies. The increased frequency of circulating Tfh cells in SLE patients was positively correlated with SLEDAI, serum IgG, antinuclear antibody titer, and anti-DSDNA (P=0.0004, 0.0006, 0.0237, and 0.0000). In the presence of autologous CD4+ T cells, B cells in SLE patients produced more IgG than those in the healthy control group [5]. There is growing interest in using microRNAs (miRNAs) as biomarkers for different diseases. In body fluids, whether they are mainly encapsulated in exosomes is still controversial. Therefore, Perez-Hernandez Javier studied whether microrNA in urine is concentrated in exosomes [6]. The severity of bacterial pulmonary infection in patients with systemic lupus erythematosus (SLE) varies greatly. Jing Gao studied the significance of procalcitonin (PCT) and C-reactive protein (CRP) in assessing the severity of pulmonary infection in SLE patients. Jing Gao studied 117 SLE patients (107 females and 10 males) enrolled from January 2010 to June 2011. Serum PCT and CRP levels were measured by elisa [7].

This paper first introduces lupus and two drugs related to its treatment. In this study, the effect of prednisone combined with prednisone on immune function in patients with systemic lupus erythematosus was studied, and the experimental results showed that prednisone combined with

prednisone had a stronger regulatory effect on the above inflammatory related indicators in patients [8-9]. The mechanism of action may be related to the restorative effect of Mycophenol ester on the balance of immune function in patients [10].

2. Proposed Method

2.1 SLE

There may be a variety of clinical complications of SLE, and nephritis is one of its severe complications, with a high morbidity and mortality of patients. Adult female patients before the age of 50 are more common, while the number of male and female patients is smaller. However, since male and female patients are more likely to present with clinical manifestations of acute kidney damage at the same time, and the condition of female patients may be more serious; In most cases, male patients may present with acute urinary protein and are more likely to be accompanied by a significant increase in acute creatinine. If patients are not timely and effective prevention and treatment in the early stage, the kidney function level may continue to decline seriously and gradually develop into other kidney function diseases, thus seriously affecting the normal quality of life and normal working ability of patients with kidney disease.

2.2 Prednisone and Mycophenol Ester

It has been found that mycophenol ester can effectively alleviate the damage of important organs in patients, and there is no liver toxicity. Therefore, the restorative effect of the combined drug on renal function in patients may be related to the effect of Mycophenolate morector to enhance the immunity of patients, protect the kidney from attack and suppress autoantibodies. At the same time, patients with systemic lupus erythematosus may experience immune dysfunction caused by excessive complement depletion or loss. Mycophenol ester combined with prednisone significantly improved SLEDAI score and immune function in patients with systemic lupus erythematosus, significantly better than prednisone alone.

3. Experiments

3.1 Experimental Background

Systemic lupus erythematosus (SLE) is an autoimmune systematic disease, etiology and pathogenesis concretely at present has not yet been fully clarify science, disease happens in childbearing age young women, but also is likely only happen in some old people, because of the elderly SLE pathogenesis clinical less rare, and general characteristics of the major clinical manifestations of SLE young women have more different, often prone to misdiagnosis. Although great progress has been made in basic research on SLE, the focus is on the relationship between the disease and the immune system. Therefore, it is imperative to study the direct impact of various therapeutic immune drugs on the autoimmune system function of patients with the disease.

3.2 Experimental Design

Thirty patients with SLE were selected as the experimental group, and 30 healthy patients were randomly selected as the control group. The levels of T cells, B cells and NK cells in peripheral blood were detected by flow cytometry. Thirty patients were randomly divided into two groups: one group received static prednisone treatment and the other group received oral MMF combined with prednisone treatment.

The results showed that compared with the control group, CD3+CD4+Th cells in SLE patients were significantly decreased ($P < 0.0001$), and CD3+CD8+Ts cells (CD3+CD8+ inhibitory T cells) were significantly increased ($P= 0.0003$). CD3-(CD16CD56)+NK and CD3+(CD16CD56)+NK cells in elderly SLE patients were significantly decreased compared with the control group ($P<0.0001$), while CD3-CD19+B cells were significantly increased compared with the control group ($P=0.0002$). Cd3-cd19 +B cells in peripheral blood of elderly SLE patients were positively

correlated with SLEDAI (P=0.0034, R=0.2678). Some experimental results are shown in Table 1.

Table 1. Experimental results

Groups		MMF + Hormone	Hormone
CD3- CD19+ B cell	Before treatment	13.70 ±2.562	16.99 ±1.984
	After treatment	7.895 ±0.619	7.344±0.674
CD3+ CD4+ Th cell	Before treatment	26.45 ±2.674	26.37 ±2.552
	After treatment	29.82 ±3.654	38.55 ±1.667
CD3+ CD8+ Ts cell	Before treatment	25.43 ±2.979	30.68 ±3.675
	After treatment	5.652±0.125	27.34±2.678

4. Discussion

4.1 Effect of Prednisone Combined with Mycophenol Ester on Immune Function in Patients with Systemic Lupus Erythematosus

As shown in Figure 1, this study found that the number of CD4+T cells in peripheral blood of SLE patients decreased and the number of CD8+T cells increased, further leading to the imbalance of CD4+/CD8+, which was consistent with previous research results. Studies have shown that although the number of CD4+T cells in peripheral blood of SLE patients is decreased and the number of CD8+T is increased, it can still lead to over-activation of B cells and then produce various kinds of autoantibodies, causing the disease. Hyperfunction of B cells, overactivation of which produces a large number of autoantibodies, can lead to the occurrence and development of SLE. In peripheral blood B cells of patients with active SLE, TRAF, as a negative regulator of TNF signaling in the regulation of apoptosis, may inhibit apoptosis by connecting with anti-apoptotic proteins, thus leading to prolonged survival of B cells and the production of more autoantibodies, which are pathogenic. The present study also found that patients with lupus had significantly elevated B cells, which were positively correlated with SLEDAI.

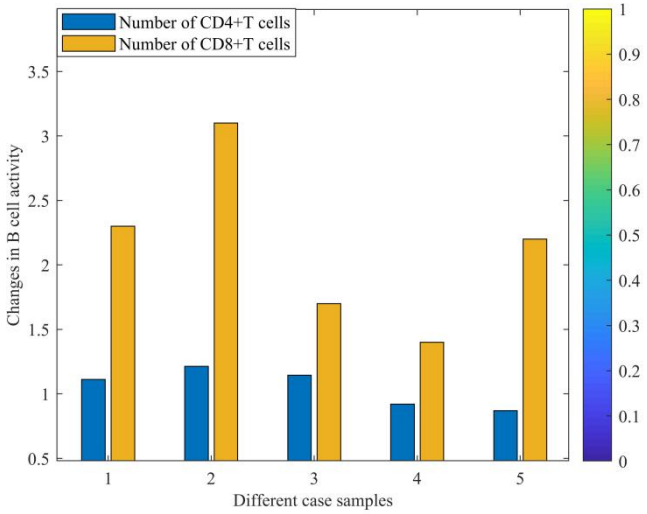

Figure 1. Changes of immune cells in the two groups

It has been reported that the number of NK cells decreased significantly in SLE patients. The results of this study also suggested that the number of NK cells in elderly SLE patients was significantly lower than that in the normal control group. The study found that the NK cell apoptosis caused by circulating immune complex and serum cytokines may lead to the decrease of NK cells in SLE. The drugs used to treat SLE are mainly glucocorticoids and immunosuppressants. MMF is considered to be an important treatment for lupus kidney and has little toxic and side effects. Studies have confirmed that MMF has a high degree of anti-B and T cell proliferation,

reduces the production of autoantibodies and anti-DNA antibodies, thus reducing the concentration of circulating immune complex and correspondingly reducing the deposition of immune complex in the kidney and delaying renal damage. However, so far, studies on the therapeutic effects of MMF have been limited to lupus kidneys, and after 4 weeks of combined treatment with MMF, CD3+CD4+Th cells were significantly higher and B cells were significantly lower than before treatment. After 4 weeks of hormone therapy alone, only B cells were significantly reduced compared with that before treatment, indicating that MMF and glucocorticoid can regulate the distribution of immune cells in SLE patients. However, combined application of MMF and hormone was superior to that of hormone alone in regulating the effect of immune cells. Large sample test is still needed to prove this study.

As shown in Figure 2, compared with the control group, CD3+CD4+Th cells in SLE patients were significantly decreased (P<0.0001), and CD3+CD8+Ts cells were significantly increased (P=0.0003). CD3-(CD16CD56)+NK and CD3+(CD16CD56)+NK cells in SLE patients were significantly decreased compared with the control group (P<0.0001), while CD3-CD19+B cells were significantly increased compared with the control group (P=0.0002). Peripheral blood lymphocyte subsets in SLE patients are positively correlated with SLEDAI (P=0.0034, R=0.2678). However, CD3+CD4+Th(P=0.0710, R=0.3150), CD3+CD8+Ts(P=0.126, R=0.2456), NK(P=0.0987, R=0.5741) cells were not significantly correlated with SLEDAI activity index. Influence of MMF on peripheral blood lymphocyte subsets in SLE patients after single hormone therapy, CD3-CD19+B cells were significantly decreased compared with that before treatment (P=0.0359). After treatment, CD3+CD4+Th cells were significantly increased (P=0.002) and CD3-CD19+B cells were significantly decreased (P<0.0001). MMF combined with hormone had better effect on lymphocyte subsets than single hormone group.

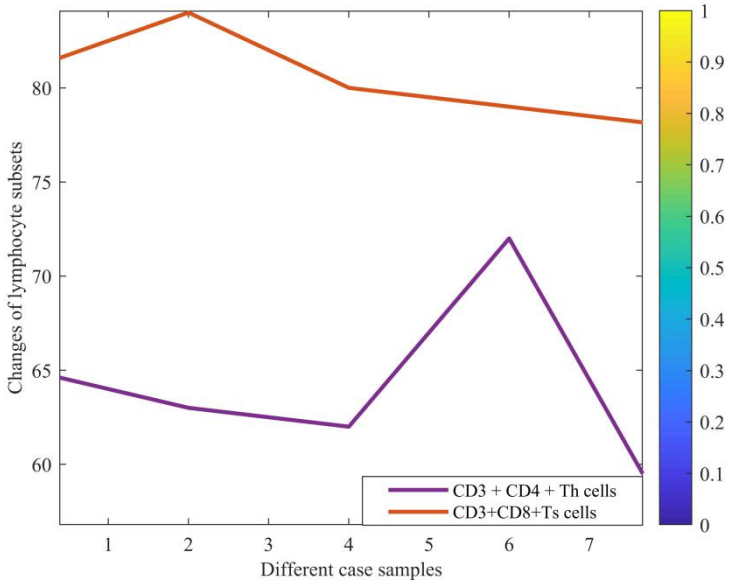

Figure 2. Comparison of lymphocyte subsets in SLE patients with that in the control group

In the combined treatment group, the total incidence of adverse reactions was 44%, among which 1 of the 50 patients withdrew from treatment due to white blood cell WBC decreased to 3.0×109^9/L, 1 patient stopped treatment due to rash and anaphylaxis, the total incidence of adverse reactions was 40%, and 1 patient withdrew from treatment due to severe pulmonary infection and herpes zoster. A total of 22 patients in the combined treatment group had adverse reactions, with a total incidence of 44% (22/50), and 20 patients in the CTX group had adverse reactions. No rash occurred in the CTX group, with a total incidence of adverse reactions of 40% (20/50), showing no statistically significant difference (x^2=0.164, P > 0.05). It has been found that the levels of McP-4, ESR and WBC in serum of patients with systemic lupus erythematosus are closely related to the degree of disease progression. The results of this study showed that after treatment, the levels of

McP-4 and ESR in both groups were significantly lower than that before treatment, WBC was significantly higher than that before treatment, and the changes of the above indicators were more obvious in the observation group ($P< 0.05$). It was shown that mycophenol ester combined with prednisone had a stronger regulatory effect on the levels of these inflammatory markers in patients. The mechanism of action may be related to the restorative effect of Mycophenol ester on the balance of immune function in patients.

4.2 Recommendations Based on the Effects of Prednisone Combined with Mycophenol on Immune Function in Patients with Systemic Lupus Erythematosus

Albumin is a lipid soluble protein synthesized in the microvessels of patients' liver. The liver function of patients with systemic lupus erythematosus is severely impaired after treatment, which will directly lead to significantly lower serum albumin content than the normal level. The quantification of urinary protein after treatment (24h) is of great significance for the effective evaluation of renal functional level of uric anhydride in patients in the observation group of systemic lupus erythematosus. Serum creatinine for diagnosis of one of the important indexes of renal function of the conventional medical examination, renal damage serious will directly lead to a significant degree of lupus erythematosus (sle) patients with serum creatinine level increases, the researchers have looked at two groups of patients with lupus erythematosus (sle) above the level of uric acid anhydride function indicators, laboratory analysis results show that after treatment, 2 groups of lupus erythematosus (sle) patients before the level of serum albumin and Scr was significantly higher than that of the patients before treatment, urine protein quantitative (24 h) and Scr levels were significantly lower than the patients before treatment, the above function in patients with lupus erythematosus (sle) and observed group index trend more obvious ($p < 0.05$), It has been shown that timycophenol ester combined with prednisone can significantly improve immune endocrine function in sle patients.

Own antigen and autoimmune disease is the common characteristic is the pathological basis of autoantigen antibodies and other immune antigen-antibody complexes formed by the union of activated complement autoantibodies system, is a kind of multiple organ damage, leading to disease in addition to produce its own antibodies, and other immune cells, cytokines and other immune abnormalities, the lymphocyte subsets especially mainly common T cells, B lymphocytes and NK cells for disease development has a certain risk and influence. At this stage, the clinical treatment of SLE is still dominated by glucocorticoid alone and immunosuppressive combination therapy. SLE treated solely and directly with glucocorticoid is prone to relapse due to the large amount of combined hormone. Glucocorticoid associated with joint immune inhibitors in the treatment of SLE can obviously reduce the dosage of glucocorticoid joint, effectively control the disease, and it for 7 phenol ester drugs as originally is mainly used for effective inhibition of rejection after organ transplantation immune inhibitor, has been successfully started in the clinical treatment of a variety of immune functional disease.

Conclusion

Systemic lupus erythematosus (SLE) is a typical autoimmune disease with complex and diverse etiologies. It is characterized by the production of a large number of autoantibodies, especially anti-nuclear antibodies, thus forming immune complex deposition in various parts of the body. In this paper, the effects of prednisone combined with mycophenol ester on immune function in patients with systemic lupus erythematosus were analyzed, and the results of the analysis were obtained from the treatment of patients in a hospital.

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