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AN OVERVIEW ON NATURAL TREATMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS

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Abstract

Systemic lupus erythematosus (SLE) is an auto-immune disease in which autoantibodies destroy healthy body tissues. This means that the immune system (which normally protects the body from infections) mistakenly attacks itself. Patients with systemic lupus erythematosus produce numerous antibodies against self-antigens in several organs, such as skin, joints and kidneys. The clinical features include fever, photosensitivity, serositis, and renal disease, the latter being the most life threatening due to potential development of irreversible kidney failure. There is no cure but, the conditions can usually be controlled and symptoms eased. The treatment is done by controlling the symptoms of disease. Common medication used in systemic lupus erythematosus is non-steroidal anti-inflammatory drugs, antimalarial drugs**,** high-dose corticosteroids, immunosuppressant but these drugs cause serious side effects. Numerous herbal medicines show promise for helping people with systemic lupus erythematosus. The present study is focused on the natural treatment of systemic lupus erythematosus with herbal medicines and dietary supplements. There is list of certain plants which can be used for future aspect.

Keywords: Lupus erythematosus, autoimmune disease, herbal medicines, dietary supplement, systemic lupus erythematosus.

Introduction

Systemic lupus erythematosus often abbreviated as SLE or lupus, is a systemic autoimmune disease (or autoimmune connective tissue disease) that can affect any part of the body. As occurs in other autoimmune diseases, the immune system attacks the body's cells and tissue, resulting in inflammation and tissue damage.[1] It is a Type III hypersensitivity reaction caused by antibody-immune complex formation. Systemic lupus erythematosus most often harms the heart, joints, skin, lungs, blood vessels, liver, kidneys, and nervous system. The course of the disease is unpredictable, with periods of illness (called *flares*) alternating with remissions. The disease occurs nine times more often in women than in men, especially in women in child-bearing years age 15 to 35, and is also more common in those of non-European descent.[2] Common initial and chronic complaints include fever, malaise, joint pains, myalgias, fatigue, and temporary loss of cognitive abilities. Because they are so often seen with other diseases, these signs and symptoms are not part of the diagnostic criteria for Systemic lupus erythematosus when occurring in conjunction with other signs and symptoms like butterfly rash, Low platelet and white blood cell counts, renal failure and some other Cardiac, Pulmonary, Renal, Neuropsychiatric, Neurological symptoms.[3] This disease is most commonly treated by non-steroidal anti-inflammatory drugs, antimalarial drugs**,** high-dose corticosteroids, immunosuppressive drugs.[4]

"Lupus" is Latin for wolf, and "erythematosus" refers to the red rash on a person's face that makes them look wolf-like. Lupus erythematosus is a chronic, inflammatory auto-immune disease that is more common than muscular dystrophy, cystic fibrosis, leukemia, or multiple sclerosis. It is difficult to say what causes lupus, because

autoimmune diseases are multifactorial with genetic, environmental, hormonal, viral, and sychoneurological influences all playing a role.

Types of lupus

- Discoid lupus erythematosus (DLE) - a milder form of the disease, is identified by an inflammation that primarily affects the skin in the form of a rash.
- Systemic lupus erythematosus (SLE) - the more serious form of the disease can involve any organ in the body particularly the joints, skin, blood, kidney, heart, lungs, and nervous system. Symptoms often oscillate between exacerbation and remission, however, some people with lupus are unaware that they even have the disease, while others have major complications.[5]

Natural treatment of systemic lupus erythematosus : Medicinal plants impart significant roles in the prevention of human being from various pathogenic microorganisms and the diseases with minimum risk of side effect. Use of plant drugs and dietary supplement is beneficial in treatment of systemic lupus erythematosus. Natural therapies involving diet and lifestyle may be effective at modifying or removing the cause of systemic lupus erythematosus.[6] **(Table 1)** include some Chinese herbs and medicinal plant which is used in treatment of systemic lupus erythematosus.

Table1. Investigated plant list used in systemic lupus erythematosus treatment.

Botanical name	Family	Plant part and extract used	Chemical constituents	Reference No.
Astragalus Membranaceus	Leguminosae	Root	Astrapterocarpan, betaine, Astralosides	[7]
Ganoderma Lucidum	Ganodermataceae	Spores	Ganoderic acid, Polysaccharides	[8]
Tripterygium Wilfordii	Celastraceae	Ethyl acetate extract	Diterpenoid triepoxide, Alkaloids	[9]
Antrodia camphorate	Polyporaceae	Mycelia extract	Benzenoids, polysaccharides,terpenoids	[15]
Artemisia Annua	Asteraceae	Ethanolic extract	Cineole, spathulenol, Camphene	[10]
Lentinus edodes	Marasmiaceae	Fruiting body	proteins, fats, vitamins, carbohydrates,	[11]

Astragalus membranaceus

Astragalus Root could decrease overactive immune function in people with systemic lupus erythematosus (systemic lupus erythematosus). Astragalus inhibited viral replication in the myocardial tissue while improving abnormal myocardial electric activity. The patients with systemic lupus erythematosus had significantly decreased natural killer cell activity when compared to normal controls. Preincubation of their peripheral blood mononuclear cells with astragalus stimulated natural killer cell cytotoxicity in systemic lupus erythematosus patients and in healthy controls. [12]

Ganoderma lucidum

Systemic lupus erythematosus is a disease which includes, without limitation, dysfunction of the nervous system, neuromusculature including multiple sclerosis, myotonias and muscular dystrophy. It has immune enhancing properties and the spores of ganoderma represent the essence of ganoderma because they contain all the bioactive substances. The *Ganoderma Lucidum* spores can be co-administered with a corticosteroid hormone to achieve a better therapeutical activity on relieving/reducing the symptoms associated with systemic lupus erythematosus. The results indicate that the combined treatment of *Ganoderma Lucidum* spores can and corticosteroid restores the T cell counts in the lupus mice to a level comparable to those in the normal mice. [13]

Tripterygium wilfordii

The Chinese herb *Tripterygium wilfordii* Hook F (TWHF, known in China as Lei-Gong-Teng, which translates into the "thunder god" vine, a vinelike member of the Celastraceae plant family), has been used in traditional Chinese medicine (TCM) for the treatment of autoimmune diseases including systemic lupus erythematosus. The Chinese herbal decoction may contain some active pharmacological compound with immunosuppressive properties and the ethyl acetate (EA) extract of *Tripterygium wilfordii* Hook F (TwHF), a Chinese herbal medicine, in the treatment of systemic lupus erythematosus. Treatment with the ethyl acetate extract significantly inhibited the progression of kidney disease, though had no significant effect on the levels of anti-dsDNA antibody. [14]

Antrodia camphorate

Antrodia camphorata is used in folk medicine for the treatment of inflammation syndromes and liver-related diseases. The mycelia extract of *Antrodia camphorata* is used for the treatment of systemic lupus erythematosus. *Antrodia camphorata* reduced urine protein and creatinine levels and suppressed the thickening of the kidney glomerular basement membrane, suggesting that *Antrodia camphorata* protects the kidney from immunological damage resulting from autoimmune disease. [15]

Artemisia annua

Artemisia annua has been widely used to treat autoimmune diseases such as systemic lupus erythematosus and rheumatoid arthritis in traditional Chinese medicine. Ethanolic extract of *Artemisia annua* significantly suppressed concanavalin A (Con A) and lipopolysaccharide (LPS)-stimulated splenocyte proliferation in vitro in a concentration-dependent manner. The ethanol extract of Artemisia annua could suppress the cellular and humoral response. *Artemisia annua* has immunosuppressive activity for treatment of some autoimmune diseases. [10]

Lentinus edodes

Lentinus edodes commonly known Shiitake mushroom the fruiting body is used as a food and medicine, and it's a rich source of proteins, fats, carbohydrates, fiber, vitamins and minerals. Shiitake mushroom is revered in Asian medicine for its health-promoting effects, it boosts the immune system, lowers cholesterol and is helpful in treatment of autoimmune diseases like systemic lupus erythematosus. It contains other nutrients helpful in strengthening the immune system and fighting disease-causing organisms. [16]

Lupus and dietary factors

The relationship between nutrition and systemic lupus erythematosus remains elusive especially since most autoimmune diseases are multifactorial in origin with genetic, environmental, hormonal, viral, and psychoneurological influences all playing a role. It is known that no specific diet for the treatment of disease exists but deficiency or presence of certain substances in the diet may aggravate or alleviate disease symptoms.

Potential positive impact on disease activity

Selenium (Se)

Anti-inflammatory properties have been attributed to selenium, a natural antioxidant. Supplementing the diets of auto-immune mice with selenium increases their survival time, and although the mechanism by which selenium exerted this effect is unclear, there is a significantly higher level of natural killer cell activity in the selenium-supplemented mice. Some researchers have suggested that physicians could check glutathione-peroxidase GSH-Px activity and consider selenium and vitamin E supplementation in people with systemic lupus erythematosus or other conditions such as severe psoriasis, eczema, dermatitis and liver disease. Again, warnings against high intakes of selenium should be given to patients since toxicity results in symptoms of diarrhea, vomiting, hair and nail loss, and lesions of the nervous system and skin. Dietary sources of selenium are pike, wheat germ, sunflower seeds, lobster, octopus, oysters, chicken livers, whole wheat flour, salmon, liverwurst pork, sardines. [17]

Vitamin A

Vitamin A deficient lupus animals were reported to experience more severe lupus-like symptoms. Researchers attributed this observation to increased hypergammaglobulinemia and an earlier onset of autoantibody, both naturally occurring thymocytoxic autoantibody and IgM anti-erythrocyte antibodies. Three patients whose skin lesions flared with sun exposure were given 50 mg of beta-carotene three times daily, and experienced a clearing of all lesions starting within one week of treatment. Dietary sources of vitamin A are carrot juice carrots (raw), sweet potato, shallots (raw), mixed vegetables (canned), pumpkin, spinach, kale, apricot halves (dried), collard green, red bell pepper (raw). [18]

Fish Oils (Vitamin E and omega-3-fatty acids)

Vitamin E treatment delays the onset of autoimmunity and extends mean survival time. Dietary sources of vitamin E are wheat germ oil, sunflower oil, sunflower seed, rice bran oil, almonds canola oil, cod liver oil, wheat germ. [19]

Fish oils retard, but do not entirely prevent, lupus-like disorders found in autoimmune-prone mice. These mice eventually develop the illness, but at a slower rate than controls. Fish oil supplementation appears to have an anti-inflammatory effect, and prolongs the life of autoimmune-prone mice. This competition shifts production to the non-inflammatory series-3 prostaglandins and leukotrienes that have been suggested to directly suppress immunologic and or inflammatory mediators of murine lupus. However, omega-3 fatty acids have been reported to improve blood lipid values which are of benefit to patients with systemic lupus erythematosus who have a higher

rate of premature atherosclerosis than the general population. Dietary sources of omega-3 fatty acids (EPA/DHA) are sardine oil, cod liver oil, walnut oil, canola oil, walnuts, mayonnaise, mackerel, sablefish, salmon (chinook), whitefish, herring, bluefin tuna, soy nuts/soybeans, atlantic sardines in oil, oyster, rainbow trout, swordfish, sea bass, scallops. [20]

Bromelain

Although no animal or human studies have been conducted on bromelain related to systemic lupus erythematosus, this complex of proteases from the pineapple plant has been known to act as an anti-inflammatory agent. [21]

Evening Primrose Oil (EPO)

Evening Primrose Oil was reported to increase survival time in autoimmune mice, and this may be due to its gamma-linolenic acid (19%) content from which prostaglandin E1 is formed. Studies support the role of prostaglandin E1 treatment alone in delaying the onset and severity of lupus in autoimmune animals. This beneficial effect of prostaglandin E1 might be due its anti-inflammatory effects via membrane stabilization and lowering lymphocyte activity. [22]

Corticosteroids, Calcium and vitamin D

The long-term use of corticosteroids, the most commonly prescribed immunosuppressant contributes to the decreased number of autoimmune disease symptoms. Calcium and vitamin D are not reported to alleviate symptoms of systemic lupus erythematosus, however, they are recommended as part of the treatment against osteoporosis, the most serious side-effect of long-term corticosteroid therapy. Plants containing corticosteroids are *Cissus rotundifolia, Sphenocentrum jollyanum, Boswellia elongate, Paeonia lactiflora.* [23]

Potential negative impact on disease activity

Fat (Especially saturated & polyunsaturated omega-6 fatty acids)

Diets high in overall fat were associated with more severe autoimmune disease and decreased life span in mice compared to a control group, whereas low fat diets were reported to retard the development of disease. Examples of food source of omega-6 fatty acid is safflower oil, poppyseed oil, corn oil, wheat germ oil, cottonseed oil, sesame oil, rice bran oil, liquid margarine, peanut oil, pine nuts, pumpkin kernels. [24]

Zinc

Zinc is important for enhancing the immune response, and zinc deficient diets were reported to have increased survival times. Researchers observed a decrease in lymphoproliferation, and a delayed expression of autoantibodies. Zinc deprivation results in increased serum corticosteroids which may contribute to the decreased number of autoimmune disease symptoms. [25]

Alfalfa (L-Canavanine)

The cholesterol-lowering effect of alfalfa seeds observed signs of systemic lupus erythematosus-like symptoms in both laboratory animals and a few human case studies. Two human patients were reported to experience symptoms of malaise, lethargy, depression, and arthralgias after ingesting 8-15 alfalfa tablets daily. In vitro experiments suggest that L-canavanine, an amino acid in alfalfa products, acts on suppressor-inducer T cells to regulate antibody synthesis and lymphocyte proliferation. [26]

List of certain plants which can be used for future aspect

The list of certain plants with anti-inflammatory, anti-malarial and immunomodulatory activity which may be used in future to control the symptoms of disease. In future research can be performed on these plants for effective treatment of systemic lupus erythematosus. (**Table 2)** includes the list of plants which is useful in future research for treatment of systemic lupus erythematosus.[27]

Table2. List of plants which can be used in future for treatment of Systemic lupus erythematosus.

Botanical name	Family	Plant part used	Chemical Constituents	Uses	Reference
Hibiscus tiliaceus	Malvaceae	Leaves	Hibiscus amide, Vanillic acid, Scotoletin, Hibiscolactone, Hibiscones, Fumaric acid	Anti- inflammatory activity	[28]
Phyllanthus emblic	Euphorbiaceae Fruit, Leaves	Fruit, Leaves	Kaempferol-3-O-alpha-L-(6"-methyl) rhamnopyranoside, kaempferol-3-Oalpha- L-(6"-ethyl)rhamnopyranoside	Anti- inflammatory activity	[29]
Malvestrum Coromandelianum	Malvaceae	Aerial part	Alkaloids, Tannins, Steroids, Terpenoids	Anti- inflammatory activity	[30]
Ichnocarpus Frutescens	Apocynaceae	Leaves, Roots, Stem	Phenylpropanoids, phenolic acids, coumarines, flavonoids, sterols and pentacyclic, triterpenoids	Anti- inflammatory activity	[31]
Lagerstroema lanceolata	Lythraceae	Seeds	Steroids, alkaloids, antocyanins ellagic acid, tannins	Anti- inflammatory activity	[32]
Bryophyllum pinnatum	Crassulaceae	Leaves	Flavanoids, steroids, bufadienolides, digoxin, digitoxin	Anti- inflammatory activity	[33]
Boswellia elongate	Burseraceae	Bark	Steroids, flavonoids,	Anti-malarial activity	[34]

			proteins		
Sphenocentrum jollyanum	Menispermaceae	Leaves and root	flavonoids, steroids, terpenoids, tannins and alkaloid	Anti-malarial activity	[35]
Cissus rotundifolia	Vitaceae	Leaves	Steroids, flavonoids, proteins	Anti-malarial activity	[36]
Acalypha fruticosa	Euphorbiaceae	Leaves	Tannins, flavonoids, terpenoids	Anti-malarial activity	[37]
Dendrosicyos socotrana	Cucurbitaceae	Leaves	Terpenoids, polysaccharide, protein	Anti-malarial activity	[38]
Paeonia Lactiflora	Paeoniaceae	Root	Monoterpenoid, glucosides, flavonoids, tannins, stilbenes, steroids, paeonols, phenol	Immunomodulatory activity	[39]

Botanical name	Family	Plant part and extract used	Chemical Constituents	Uses	Reference
Rhinacanthus nasutus	Acanthaceae	Aqueous and ethanolic extracts	Vanillic acid, Rhinacanthin A	Immunomodulatory activity	[40]
Centella asiatica	Umbelliferae	Aqueous extracts	Glycosides, steroid,tannins, vallarine	Immunomodulatory activity	[40]
Tinospora cordifolia	Menispermaceae	Whole plant	Glucoside, alkaloids, steroids, terpenoid	Immunomodulatory activity	[41]
Nelumbo nucifera	Nymphaeaceae	Rhizome and seed	Betulinic acid, steroid, pentacyclic triterpenoid	Immunomodulatory activity	[42]

Capparis zeylanica	Capparidaceae	Leaves extract	Flavonoids, glycosides, saponins, steroids	Immunomodulatory activity	[43]
Allium sativum	*Liliaceae*	Bulbs	Proteins, alliin, alliinase, allicin,	Immunomodulatory activity	[44]
Kalanchoe pinnata	*Crassulaceae*	Leaves	Flavonoids, glycosides, terpenoid	Immunosuppressive activity	[45]

Conclusion

Systemic lupus erythematosus is an autoimmune disease in which auto antibodies destroy body healthy tissues. While systemic lupus erythematosus treatment can be challenging, data available from clinical trials are increasing each year, and treatment strategies will continue to be refined. Common medications used in treatment are NSAIDs**,** anti-malarial drugs, corticosteroids, immunosuppressive drugs but side effects of these drugs are more. Present study concludes that Chinese herbs and some medicinal plants can be effectively used in treatment of systemic lupus erythematosus and at the same time proper intake of dietary supplements is helpful to control systemic lupus erythematosus disease. In future, investigation of certain traditional plants will ensure and provide valuable clues for research and also help to develop new and potent drugs for the treatment of systemic lupus erythematosus.

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