Treatment of Autoimmune Diseases with Biological Agents: a general review

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The etiology of autoimmune diseases such as systemic lupus erythematosus, rheumatoid arthritis and scleroderma remains largely unknown. Current acceptable therapy for rheumatoid arthritis is aimed to attenuate disease activity with a combination of disease modifying antirheumatic drugs (DMARDs) such as methotrexate, sulfasalazine, cyclophosphamide, cyclosporin and hydroxychloroquine. Despite aggressive medical treatment, the morbidity and mortality of these illnesses are still high. The main reason leading to this disappointed outcome is because of the poor understanding of pathophysiologic processes underlying the illness. Accordingly, it hampers the development of effective therapy for these diseases.

Although a combination therapy provides a reasonable therapeutic response to autoimmune diseases, the accompanied side effects from using these medications set a drawback to their use. The research aimed to develop more powerful, less expensive, and less harmful drugs or agents never stop. Over past few years, several so-called "Biological Agents" have been established as new modalities to treat autoimmune diseases. Excitingly, several clinical studies do demonstrate their great potential although the long-term side effects are still an open question. These biological agents include antibodies or fusion proteins that inhibit the effects of tumor necrosis factor alpha as well as the inhibitors of interleukin-1 receptor alpha. Given the important roles of both interleukin-4 and interleukin-10 in the inhibition of inflammatory response, these cytokines may also be potential agents to aim for.

My talk will cover several issues, including how these biological agents were developed, the mechanisms and the side effects of these agents, and the future of using these agents to treatment autoimmune diseases.