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Subcutaneous Immunoglobulin Therapy In The Chronic Management Of Myasthenia Gravis.

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Abstract

Subcutaneous immunoglobulin therapy has been recently researched and shown to be favorable and to have advantages over intravenous immunoglobulin therapy, in the chronic management of myasthenia gravis. This report aims to discuss the findings of research into this new long term therapy option for myasthenia gravis.

Introduction

Myasthenia gravis (MG) is an autoimmune neuromuscular disorder. Its pathogenesis involves autoantibodies localized at the neuromuscular junction. These antibodies are directed against nicotinic acetylcholine receptors (AchR), muscle-specific-kinase (MuSK) and lipoprotein receptor-related protein 4 (LRP4).[1]
The disease is characterized by fluctuating muscle weakness and abnormal fatigue of voluntary skeletal muscle. At first, it clinically presents with ocular symptoms such as, ptosis and diplopia due to involvement of the extraocular muscles. 80% of cases proceed to involve other muscles. Thymomas are associated with 20% of cases as well as other autoimmune diseases such as hyperthyroidism and Hashimoto's disease.[2]

Discussion

Long term therapy is essential for patients with MG. Pyridostigmine is the favored drug for symptomatic treatment, however for patients who are unresponsive to this treatment the first-line of therapies are immunosuppressive treatments by corticosteroids, azathiporine and thymectomy.[1]
Although oral immunosuppressive drugs remain the mainstay of therapy for MG, immunoglobulin (Ig) therapy has become an important treatment option and there has been an increase in the use of intravenous immunoglobulin (IVIg) in acute treatment of exacerbation and in chronic management of the disease.[3]
IVIg is derived from blood donors where immunologulin G (IgG) is isolated from the blood.[3] IgG works on the immune system in many ways including; acceleration of IgG catabolism, suppression of antibody production and inhibition of complement activation. IVIg is useful in the treatment of MG crisis and during acute worsening of the disease since its therapeutic effects appear within 2-3 days upon administration and last for several weeks.[3] The most common side effects are mild and associated with the infusion process. During early infusion of IVIg the patient may suffer from chills, headache, myalgia, chest discomfort and shortness of breath which can be relieved by slowing the rate of infusion. Allergic reactions may occur in the form of skin reactions such as erythematous rash.[3]
Recent studies have shown subcutaneous immunoglobulin (ScIg) to be an effective alternative in chronic management of the disease.[4] Research was carried out during the period of 2015-2016 at the Ottawa Hospital in Canada on a group of MG patients to measure the clinical response and MG disease activity after initiation of ScIg therapy. The patients were of various clinical subtypes, severity of the disease varied among patients as well as antibody status and disease duration ranged from 1-31years.
Standard scales were used to assess the progress of patients, prior to and following ScIg administration, according to the Myasthenia Gravis Foundation of America (MGFA) clinical classification, MG activities of daily living profile (MG-ADL) and the MG quality of life

(MG-QOL) [4] which measure symptomatic muscle weakness and physical role / social functioning respectively. An additional scale was used to incorporate all these measurements called the visual analog scale (VAS).
This is trial showed ScIg to have a statistically significant improvement for all three scale measurements MG-QOL, MG-ADL and VAS. There was a decreased rate of treatment-related allergic and toxic reactions. MG-ADL score improved regarding everyday behavior such as chewing, breathing, swallowing, ability to rise from a chair, visual functioning was also improved regarding diplopia and ptosis. [4]
Administration of ScIg allows the monthly dose of Ig to be fractionized into smaller portions of weekly doses which offered the benefit of self-administration.[4] It also helps maintain a more constant level of serum Ig[5] which achieves more control of muscle weakness and avoids the depression of Ig serum levels during the interval period between monthly IVIg doses.[4]
Unlike IVIg ,ScIg infusion does not present with the adverse effects[4]; fever, headache , hypertension or thromboembolic events. However in acute myasthenic exacerbations a rapid high level of serum Ig may not be achieved with ScIg therefore IVIg would be the preferred choice.
Economical analysis should be taken into consideration when comparing immunotherapy to conventional treatments by oral immunosuppressive drugs. Immunotherapy is far more expensive[4] therefore may not be suitable for all patients, however the long term use of oral drugs and the indirect risks and complications need also be taken into consideration.

Conclusion

ScIg has shown to have a good clinical outcome, patient satisfaction and an overall improved VAS scales, MG-QOL and MG-ADL. It has also shown to have fewer side effects than IVIg and better control of myasthenic symptoms as well as controllable Ig serum levels. Cost analysis of this treatment should be taken into consideration if it was to be used in the chronic management of myasthenia gravis. In conclusion ScIg therapy has shown a positive end result and should be further researched.

References

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