Global prevalence of myasthenia gravis and the effectiveness of common drugs in its treatment: a systematic review and meta-analysis

ABSTRACT

Background: Myasthenia gravis is a neuromuscular autoimmune disorder characterized by weakness and disability in the voluntary muscles. There have been several preliminary studies on the epidemiology of myasthenia gravis in different parts of the world and the effectiveness of common drugs in its treatment, but there has been no comprehensive study of the efficacy of common drugs in the treatment of myasthenia gravis. Therefore, this study aimed to determine the epidemiology of myasthenia gravis globally and the effectiveness of common drugs in its treatment using systematic review and meta-analysis. Methods: Research studies were extracted from IranDoc, MagIran, IranMedex, SID, ScienceDirect, Web of Sciences (WoS), ProQuest, Medline (PubMed), Scopus and Google Scholar based on Cochran's seven-step guidelines using existing keywords extracted in MeSH browser. The I2 test was used to calculate the heterogeneity of studies, and Begg and Mazumdar rank correlation tests were used to assess publication bias. Data were analyzed using Comprehensive Meta-Analysis software (Version 2). Results: In the search for descriptive studies based on the research question, 7374 articles were found. After deleting articles unrelated to the research question, finally, 63 articles with a sample size of 1,206,961,907 people were included in the meta-analysis. The prevalence of MG worldwide was estimated to be 12.4 people (95% CI 10.6-14.5) per 100,000 population. For analytical studies on the effectiveness of common myasthenia gravis drugs, 4672 articles were found initially, and after removing articles unrelated to the research question, finally, 20 articles with a sample size of 643 people in the drug group and 619 people in the placebo group were included in the study. As a result of the combination of studies, the difference between the mean QMGS score index after taking Mycophenolate and Immunoglobulin or plasma exchange drugs in the group of patients showed a significant decrease of 1.4 ± 0.77 and 0.62 ± 0.28, respectively ($P < 0.01$). Conclusion: The results of systematic review of drug evaluation in patients with myasthenia gravis showed that Mycophenolate and Immunoglobulin or plasma exchange drugs have positive effects in the treatment of MG. It also represents the positive effect of immunoglobulin or plasma exchange on reducing SFEMG index and QMGS index and the positive effect of Mycophenolate in reducing MG-ADL index, SFEMG and Anti-AChR antibodies index. In addition, based on a meta-analysis of the random-effect model, the overall prevalence of MG in the world is 12.4 people per 100,000 population, which indicates the urgent need for attention to this disease for prevention and treatment.

Keyword: Drug; MS; Meta-analysis; Myasthenia gravis; Prevalence; Systematic review