Epidemiology of Myasthenia Gravis in the European region

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Introduction

Myasthenia Gravis (MG) is a disease characterised by weakness and fatigability of the voluntary muscles and caused by a defect in the transmission of nerve impulses to muscles. The natural history of MG is not well known and further studies are needed in order to identify the real epidemiological characteristics and the pathophysiology of the disease. A systematic review of all available epidemiological data is often sufficient to produce a reliable overall estimate of prevalence for RD. However, heterogeneity between different studies and possible bias are the main problems in order to pool several epidemiological indices.

Objectives

- to review all available epidemiological studies on MG performed in the European region
- to evaluate how to pool the results of different studies, in order to perform more reliable interstudy comparison and to estimate the quality of each study and its contribution to the overall incidence in the European community

Methods

We performed a systematic search in PubMed using the terms “Myastenia gravis”, “epidemiology”, “prevalence”, “incidence”. We excluded articles that reported only clinical data on MG (symptoms and/or diagnosis). Detailed information about European population based studies has been collected. In particular, we focused on study references, case definitions, study design and epidemiological indices. Point prevalence and mean annual incidence rate were calculated per 10,000. 95% confidence intervals (CIs) for each rate have been calculated using Poisson distribution.

Results

- We found a total of 13 available population-based studies on the epidemiology of MG during the last twenty years (Tab 1).
- The annual incidence was reported to range from 0.04 to 0.71 and the point prevalence rate from 0.7 to 1.5 per 10000 (Fig. 1-2).
- The higher prevalence was observed in England and Sweden. In England eight sources were used to identify patients with MG. In Sweden a regional database of MG patients was used to estimate the prevalence of the disease.
- Standardized rates to European population are reported only in Norway and Denmark.

Table 1 - Epidemiological studies on Myasthenia Gravis

<table>
<thead>
<tr>
<th>Region</th>
<th>Population Year</th>
<th>Incidence</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greece</td>
<td>10185913 1983-97</td>
<td>0.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Sweden</td>
<td>1763428 1988</td>
<td>nd</td>
<td>1.4</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>1531332 1983-92</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Italy</td>
<td>2924710 1993-94</td>
<td>0.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Greece</td>
<td>313599 1976-96</td>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Norway</td>
<td>4107053 1982-81</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Denmark</td>
<td>2800000 1985</td>
<td>0.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Italy</td>
<td>360950 1985-2000</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

- This review suggests that MG is a rare disease: all prevalence values lie below the threshold of 5 per 10,000 and all CI do not include 5.
- There is a wide range in the reported frequency of MG. It is difficult to distinguish a real heterogeneity in the occurrence of the disease from that due to the differences in the characteristics of the study (design, definition of the condition or methodology).
- The CIs of prevalence of different studies are quite overlapping; thus, it is possible to compare studies across the European region.
- Wide fluctuations in incidence rate among geographical regions are evident: in this case, CIs are less overlapping than CIs of prevalence rate.
- Some studies have not standardized their rates to the European population. Such standardization could facilitate comparisons between different populations.
- The higher prevalence estimated in England and Sweden is the result of a intensive surveys: such studies will have more weight in estimating the pooled European prevalence. Studies with relatively higher prevalence will have more weight.
- For diseases that have not a data collection system in place, such as MG, a systematic review or meta-analysis is necessary for producing overall epidemiological indices.
- Future epidemiological studies should take such issues into account.

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References