Epidemiology of multiple sclerosis in Iran: a systematic review and meta-analysis
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Citation

Review question
What is the overall prevalence of MS and its sensitivity analysis?

What is the prevalence of MS based on region, province, study design, and year of study?

What is the prevalence of MS based on gender?

What is the overall incidence of MS and its sensitivity analysis?

What is the incidence of MS based on region, province, study design, and year of study?

What is the incidence of MS based on gender?

What is the the meta-regression diagram for prevalence and incidence of MS based on the year?

How is the publication bias in the studies of incidence and prevalence?

What is the result of GRADE assessment of confidence in estimates of effect (Grading of evidence)?

Searches
The present systematic review focused on MS epidemiology in Iran based on PRISMA guideline for systematic review and meta-analysis. All the steps of research, including search, selection of studies, qualitative assessment, and data extraction will be carried out independently by two researchers.

The search was performed by two researchers independently. We searched the titles and abstracts of articles in six Persian databases including Scientific Information Database (SID) (http://www.sid.ir/), Barakat Knowledge Network System (http://health.barakatknss.com), Iranian Research Institute for Information Science and Technology (IranDoc) (https://irandoc.ac.ir), Regional Information Center for Science and Technology (RICST) (http://en.ricest.ac.ir/), Magiran (http://www.magiran.com/), Iranian National Library (http://www.nlai.ir/) and seven international databases including Scopus, PubMed/MEDLINE, ScienceDirect, Cochrane Library, Web of Science, Embase, PsycINFO as well as Google Scholar search engine for peer-reviewed studies published without time limit until May 2018.

The keywords used were 'incidence', 'prevalence', 'epidemiology', 'MS', 'multiple sclerosis' and 'Iran'. Boolean operators (AND & OR) were used to search by a combination of words.

Types of study to be included
Cross-sectional and epidemiological studies

Condition or domain being studied
Epidemiology of multiple sclerosis in Iran containing prevalence and incidence.

Participants/population
All epidemiological studies on MS in Iran.

**Intervention(s), exposure(s)**
Intervention: Poser or McDonald criteria for confirmed MS

**Comparator(s)/control**
That can show the prevalence and incidence of MS based on geographical region and province and other mentioned subgroups.

**Context**

**Main outcome(s)**
Overall prevalence and incidence of MS in Iran

**Additional outcome(s)**
Overall prevalence of MS and its sensitivity analysis.

- Prevalence of MS based on region, province, study design, and year of study.
- Prevalence of MS based on gender.
- Overall incidence of MS and its sensitivity analysis.
- Incidence of MS based on region, province, study design, and year of study.
- Incidence of MS based on gender.
- The meta-regression diagram for prevalence and incidence of MS based on the year.
- Publication bias in the studies of incidence and prevalence.
- Result of GRADE assessment of confidence in estimates of effect (Grading of evidence).

**Data extraction (selection and coding)**
The following information will be extracted:

- First author, year of publication, year of study, study setting, location, sample size, geographical area, province, the prevalence and incidence of MS and MS diagnostic method.

**Risk of bias (quality) assessment**
Researchers will be examining the quality of the selected articles using a scoring system based on the 8-item the modified Newcastle Ottawa Scale (NOS) for non-randomized studies. Each question will be given a score between 0 and 1. Points 0-5, 6-7 and 8-9 will be considered low quality, moderate quality and high quality, respectively. The minimum score for entering the quantitative meta-analysis process will be 5 and the articles that will be acquired the minimum qualitative assessment score entered the process of data extraction and meta-analysis.

**Strategy for data synthesis**
The present systematic review focused on MS epidemiology in Iran based on PRISMA guideline for systematic review and meta-analysis. All the steps of research, including search, selection of studies, qualitative assessment, and data extraction will be carried out independently by two researchers, in the event of any differences in opinion, a specialist will carefully investigate the issue.

We will provide a narrative synthesis of the results from the included studies.

We searched the titles and abstracts of articles in six Persian databases and seven international databases for peer-reviewed studies published without time limit until May 2018. ‘incidence’, ‘prevalence’, ‘epidemiology’, ‘MS’, ‘multiple sclerosis’ and ‘Iran’. Boolean operators (AND & OR) used to search by a
To evaluate the heterogeneity of the studies, Cochran’s Q and I² tests will be use. Heterogeneity will be defined as I²>50% and the Cochran’s Q test was defined as <0.05. Therefore, the random effects model will be use to estimate the prevalence of MS with high heterogeneity. In this study, a sensitivity analysis will be also perform to verify the stability of the data. In order to find the source of heterogeneity, a subgroup analysis will be conduct in terms of geographic area, year of study, province, and study setting while a meta-regression model will be use for the prevalence of MS in terms of year of studies. Begg and Egger’s tests will be use to assess publication bias. Data will be analyse using comprehensive meta-analysis version 2 software. P<0.05 will be considered significant.

Analysis of subgroups or subsets
The following subgroup analyses will be carried out:

Overall prevalence of MS and its sensitivity analysis;
Prevalence of MS based on region, province, study design, and year of study;
Prevalence of MS based on gender;
Overall incidence of MS and its sensitivity analysis;
Incidence of MS based on region, province, study design, and year of study;
Incidence of MS based on gender;
The meta-regression diagram for prevalence and incidence of MS based on the year;
Publication bias in the studies of incidence and prevalence;
Result of GRADE assessment of confidence in estimates of effect (Grading of evidence);

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Anticipated or actual start date
17 April 2018

Anticipated completion date
22 November 2018

Funding sources/sponsors
None

Conflicts of interest
None known.
Language
English

Country
Iran

Stage of review
Review_Ongoing

Subject index terms status
Subject indexing assigned by CRD

Subject index terms
Humans; Iran; Multiple Sclerosis; Prevalence

Date of registration in PROSPERO
08 November 2018

Date of publication of this version
04 December 2018

Details of any existing review of the same topic by the same authors

Stage of review at time of this submission

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<th>Stage</th>
<th>Started</th>
<th>Completed</th>
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<tr>
<td>Preliminary searches</td>
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<tr>
<td>Piloting of the study selection process</td>
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<tr>
<td>Formal screening of search results against eligibility criteria</td>
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<td>Data extraction</td>
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<td>Risk of bias (quality) assessment</td>
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<td>Data analysis</td>
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Versions
08 November 2018
04 December 2018

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