

Optical Coherence Tomography (OCT) Measurements and Disability in Multiple Sclerosis (MS): Protocol of Systematic Review

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Abstract

Background: It is commonly used to assess the severity and functional impairments associated with multiple sclerosis (MS) using the disability scales such as the expanded disability status scale (EDSS). A number of studies have demonstrated a correlation between optical coherence tomography (OCT) measurements, which demonstrate optical neurodegeneration, and disability, though some studies failed to detect a significant correlation.

Objectives: The purpose of this study is to investigate the relationship between optical coherence tomography (OCT) measurements and disability in people with multiple sclerosis (pwMS).

Inclusion criteria: Eligible peer-reviewed English studies will include a correlation coefficient between disability scales and OCT measurements.

Methods: The systematic review will be conducted using preferred reporting items for systematic reviews and meta-analyses (PRISMA) guideline. MEDLINE/PubMed, Scopus, Embase, and Web of Science will be searched to identify published studies without date restrictions. Studies with potential relevance will be screened by titles and abstracts, and the full texts of potentially relevant studies will be reviewed for eligibility and critical review of the methodologies. Those studies selected for inclusion will provide data that will be extracted. An analysis of the data will be carried out in a statistical meta-analysis to the extent possible.

Clinical implications: The results of this study may serve as a guide for determining which OCT measurements can be used to predict disability among pwMS.

Keywords: Central Nervous System; COVID-19; Autoimmune Disease

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Introduction

A core feature of multiple sclerosis (MS) is neurodegenerative and neuroinflammatory changes to the central nervous system (CNS). People with MS (pwMS) may experience various ranges of dysfunctions in several functional systems, including sensory, motor, visual, and neuropsychiatric. MS is characterized by relapsing-remitting disease patterns in more than 80% of cases. A secondary progressive disease, characterized by a gradual decline in neurological function,

will occur in approximately 60% of individuals with these conditions over the next 10 to 15 years. It is believed that less than one-fifth of individuals with primary progressive MS (PPMS) are affected by degradation (1, 2). The scale of severity and functional impairments in MS is assessed by various tools. The first tool used in this regard was the expanded disability status scale (EDSS) that has been developed over time (4). MS-related symptoms of optical neurodegeneration can also be assessed by optical coherence tomography (OCT). Previous

research has indicated that OCT measurements may be used both to distinguish pwMS from healthy controls (HC) and to predict changes in these patients' disability scales over time (5, 6). There is evidence that OCT measurements correlate with disability scales, although certain studies failed to detect a significant correlation (7, 8). Through a systematic review and meta-analysis, this study will examine the association between OCT measurements and disability among pwMS.

Research question

In this review, we seek to answer the question: Does OCT correlate with disability in pwMS? Is OCT measurement a reliable indicator of disability in pwMS?

Search strategy

The preferred reporting items for systematic reviews and meta-analyses (PRISMA)(9) guideline will be followed in the context of this systematic review and meta-analysis. We will conduct a systematic search of four databases PubMed/Medline, Embase, Scopus, and Web of Science with MeSh terms of "optical coherence tomography" AND "disability" AND "multiple sclerosis".

Eligibility criteria

The review will include all peer-reviewed studies which evaluate the correlation coefficient between OCT measurements and disability in pwMS in four mentioned databases.

The following conditions will be excluded: non-English articles, abstracts and conference papers, in-vivo and in-vitro studies, case reports/series, and papers without reporting correlation.

Selection process

An initial pilot search will be conducted to test the effectiveness of the search strategy and to identify relevant studies. EndNote (version 20)(10) will be used to import all citations and to remove duplicates. The titles and abstracts of all studies will be reviewed for inclusion first, followed by a review of the full text versions of the studies, in order to ensure they meet the inclusion criteria. Two independent reviewers will perform the screening, and disagreements will be discussed. If a consensus cannot be reached, a third reviewer will make the final decision.

Data extraction

Two independent researchers will evaluate the studies collected. Based on the inclusion criteria, these researchers will evaluate the eligibility of the studies, extract the required data, and evaluate the risk of bias in the studies by the Newcastle Ottawa Scale (NOS)(11). Any disagreements will be resolved by consulting a third reviewer.

Data analysis

The extracted data will be analyzed by R software (12) and the results will be presented in forest plots. Furthermore, a random-effects model will be used to estimate heterogeneity between pooled correlations, and Cochran's Q test and I² (13) values will be considered for each pooled estimation.

Deceleration

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Conflict of interest

The author declares no conflict of interest regarding the publication of this paper.

Ethical approval

Not applicable

Consent for publication

This manuscript has been approved for publication by all authors.

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