INPLASY PROTOCOL

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18F-FDG PET/CT for diagnosing idiopathic inflammatory myopathieswa: A systematic review and meta-analysis

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Review question / Objective: Polymyositis(PM) and Dermatomyositis(DM) are the main types of Idiopathic inflammatory myopathies (IIM). Patients always are diagnosed with clinical features, muscle biopsy, electrophysiological examination, circulating autoantibodies, and so on. Muscle biopsy is the gold standard. There are some things we have to consider. Patients cannot tolerate surgery, because of lidocaine allergy, coagulant function abnormality, fear of pain, and the like. So, the search for an alternative to biopsy is urgent.From 2011 to now, dozens of studies have been published on the PET/CT in myositis. We undertook a systematic review and network meta-analysis to assess the sensitivity and specificity of PET/CT in the diagnosis of myositis, provided in addition to tissue biopsy, for the diagnosis of myositis.

Information sources: We used English databases (PubMed, Embase, Cochrane) and Chinese databases(Wanfang detabase, Cnli, CBM, Cqvip) from the earliest available date of indexing through May 22, 2022.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 01 July 2022 and was last updated on 01 July 2022 (registration number INPLASY202270006).

INTRODUCTION

Review question / Objective: Polymyositis(PM) and Dermatomyositis (DM) are the main types of Idiopathic inflammatory myopathies (IIM). Patients always are diagnosed with clinical features, muscle biopsy, electrophysiological examination, circulating autoantibodies, and so on. Muscle biopsy is the gold standard. There are some things we have to consider. Patients cannot tolerate surgery, because of lidocaine allergy, coagulant function abnormality, fear of pain, and the like. So, the search for an alternative to biopsy is urgent.From 2011 to

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Condition being studied: PM and DM are common types of myositis, and muscle biopsy is considered the gold standard for diagnosis. Although some specific signs such as perifascicular atrophy, necrosis and regeneration of muscle cells, and inflammatory cell infiltration can be seen in muscle biopsy, they are often affected by the sampling site, which can only be determined by doctors' clinical experience. The severity of the lesion at the sampling site will affect the appearance of specific signs. When the lesion at the sampling site is serious, only a large number of fat substitutes may be observed, while the lesion at the sampling site is mild, and obvious necrosis and regeneration of muscle cells may not be observed. When a muscle biopsy is performed, anesthesia drugs cannot be injected into the muscle because they damage muscle cells and affect pathological results, so patients often suffer severe pain. When a muscle biopsy is performed, anesthesia drugs cannot be injected into the muscle because they damage muscle cells and affect pathological results, so patients often suffer severe pain. So it is necessary to find non-invasive and accurate diagnostic methods.

METHODS

Search strategy: We used English databases (PubMed, Embase, Cochrane) and Chinese databases(Wanfang detabase, Cnli, CBM, Cqvip) from the earliest available date of indexing through May 22, 2022. We used a search algorithm based on a combination of terms(the search formula can be found in the supplementary material). For PubMed, the search strategy usage of Medical SubHeadings (MeSH). For Embase, the EmtreeThesaurus was used in the current study. For Wanfang , the subject was the only word segment that is used. For Cnli, we combined the subject , title, and abstract to search. For CBM, we used a similar approach to Pubmed. For Cqvip, we combined title, keyword, and arbitrary field in the search.

Participant or population: Patients with dermatomyositis/polymyositis will be included.

Intervention: 18F-FDG-PET and 18F-FDG-PET/CT (nuclear medicine based imaging outcomes).

Comparator: Established clinical criteria or histopatological results as the reference standard.

Study designs to be included: Intervention studies , observational studies or case-control studies.

Eligibility criteria: Inclusion and exclusion criteria are categorized by population, interventions, comparators, outcomes and study design(PICOS). The year of publication is restricted from database establishment to 2022 and there were no restrictions regarding the language of the article.

Information sources: We used English databases (PubMed, Embase, Cochrane) and Chinese databases(Wanfang detabase, Cnli, CBM, Cqvip) from the earliest available date of indexing through May 22, 2022.

Main outcome(s): The primary outcome will be the use of nuclear tests (primarily PET-CT) to diagnose IIM. For nuclear scans primarily PET-CT scans we will be assessing the uptake of fluorodeoxyglucose (FDG) as a marker of myositis. Sensitivity, specicity, positive likelihood ratio, negative likelihood ratio, DOR, HSROC curve, the areas under the curve.

Additional outcome(s): Not applicable.

Data management: Two reviewers will independently review the list of retrieved studies.The title and abstract review will be used to identify potentially relevant articles for full text review.The reviewers will then independently check these against the pre-defined inclusion and exclusion criteria before proceeding to data extraction.

Quality assessment / Risk of bias analysis: The QUADAS-2 tool will be used by two researchers, independently to assess the quality of the included studies.

Strategy of data synthesis: RevMan and STATA software were selected to merge the extracted data. Firstly, heterogeneity was investigated. If heterogeneity exists, the degree of heterogeneity will determine whether to select random effects for meta-analysis. If there was no heterogeneity, the fixed effects were selected for meta-analysis. In addition, sensitivity analysis, bias test, etc.

Subgroup analysis: The subgroup analysis is considered if data are available for individual clinical diagnosis including polymyositis, dermatomyositis, inlcusion body myositis and anti-synthetase syndrome.

Sensitivity analysis: After deleting any one of them, the combined results of the other literatures are not very different from those without deletion, which means that sensitivity analysis has been passed.

Country(ies) involved: China.

Keywords: 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT); Inflammatory myopathy; standardized uptake value.

Contributions of each author:
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