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Protocol: A Systematic Review and Meta-Analysis of HLA-DR in Onychomycosis Susceptibility

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We use this protocol and it's working

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Abstract

Onychomycosis is a significant health concern for many populations. Onychomycosis is known to have environmental and genetic risk factors. While the HLA profile is known to affect onychomycosis susceptibility, no studies have yet synthesized these results in a meta-analysis. We are conducting a systematic review and meta-analysis of HLA-DR alleles involvement in onychomycosis susceptibility. We expect there to be an association between HLA-DR and onychomycosis however, this study will determine the strength of this. The purpose of this study is to provide a statistical basis for further research in the genetic basis of this disease and personalized treatment regimens.

Title

1 A Systematic Review and Meta-Analysis of HLA-DR in Onychomycosis Susceptibility

Registration

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3.1 Marcia Ballantyne M.D. is the PI of the research. Andrew Cook, Nathan Cohen, and Rishi Patel are first, second, third, and fourth reviewers respectively.

Amendments

4 Amendments to the protocol will be provided if necessary

Support

5 No funding was acquired for this research

Introduction

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6.1 Onychomycosis is a very common health concern. A combination of environmental and genetic factors plays a role in the development of onychomycosis infection. Environmental factors such as closed and moist footwear, socioeconomic conditions, slow nail growth, and contact transmission all contribute to onychomycosis. A variety of genetic factors such as, autosomal dominant inheritance, dectin-1 deficiency due to a Tyr238X mutation, human beta-defensin 2 copy number variation inducing IL-2, IL-IRa deficiency, and HLA-DR profile have been implicated in onychomycosis infection susceptibility. While many individual studies have examined the role of HLA-DR in onychomycosis, none have analyzed them together to determine if there is a significant effect on onychomycosis susceptibility. The purpose of this research is to provide a better understanding of the genetic role of HLA-DR profile on onychomycosis susceptibility to provide a basis for future research into personalized treatment.

6.2 Objective of Current Study: Conduct a systematic review and meta-analysis of HLA-DR alleles presence in onychomycosis patients compared to control groups.

Methods

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7.1 Patients possessing HLA-DR and onychomycosis were included in the study.

A systematic review and meta-analysis will be performed. There is no restriction on publication year. Only studies published in English will be used. This study was started in 2023.

7.2 Google Scholar, PubMed, and science direct databases will be searched for the literature review

7.3 The search terms will be used, "HLA Onychomycosis" and "HLA-DR Onychomycosis"

7.4 A shared document will be used to manage records of sources and data collected. This data will be transferred to Review Manager 5.4 for further analysis.

7.5 Four independent reviewers selected studies in this research according to the following criteria

Inclusion Criteria: Studies including patients with HLA-DR alleles with a diagnosis of onychomycosis from any fungal species compared against a control group without. Studies using odds ratio or sufficient data available to calculate an odds ratio.

Exclusion Criteria: Studies that assess alleles other than HLA-DR, too high HLA allele resolution data, studies not in English, studies using animals as subjects, and studies not using odds ratio or studies with insufficient data available to calculate odds ratios.

7.6 Data will be extracted from studies independently.

7.7 HLA-DR allele/phenotype frequencies of patients with onychomycosis and population-matched control populations will be gathered.

7.8 Outcomes: Determining odds ratios of onychomycosis given the presence of HLA-DR alleles.

7.9 Risk bias assessment: The NIH quality assessment of case-control studies tool, and a LFK indexd with DOI plot will be used.

7.10 HLA-DR allele frequency data among those with onychomycosis will be compared to those with the given allele who are healthy. This data will be inputted into Review Manager 5.4 to generate odds ratios from each study. These odds ratios will then be used to create forest plots. If a study contains multiple populations, these will be combined into one odds ratio. I2 will be used in consideration of heterogeneity. MetaXL software can be used for any other tests not covered by this program (for example: sensitivity testing).

7.11 The Grading of Recommendation, Assessment, Development and Evaluation (GRADE) system will be used in the evaluation of the strength of the body of evidence

Current Research Stage

8 The current stage of research: Protocol and manuscript creation.