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Association of Helicobacter pylori infection with the risk of neurodegenerative disorders: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 January 2025 and was last updated on 13 January 2025.

INTRODUCTION

Review question / Objective This study aims to evaluate the association between Helicobacter pylori (H. pylori) infection and the risk of neurodegenerative disorders through a systematic review and meta-analysis of existing literature evidence.

Condition being studied The pathogenesis of neurodegenerative diseases is complex, involving multiple factors including genetic, environmental, and lifestyle factors. Recent studies have suggested that infectious agents may be an important trigger for neurodegenerative diseases.

METHODS

Search strategy #1. "Neurocognitive disorders"[MeSH Terms] OR "neurological disorder*"[Title/Abstract] OR "neurodegenerative*"[Title/Abstract] OR "alzheimer*"[Title/Abstract] OR "parkinson*"[Title/Abstract] OR "huntington*"[Title/Abstract] OR "Amyotrophic lateral sclerosis"[Title/Abstract] OR "Multiple sclerosis"[Title/Abstract] OR "lewy body disease*"[Title/Abstract] OR "Frontotemporal Lobar degeneration"[Title/Abstract] OR "progressive supranuclear palsy"[Title/Abstract] OR "spinal muscular atrophy"[Title/Abstract] OR "dementia"[Title/Abstract] OR "cognitive impairment"[Title/Abstract]
#2. ("helicobacter pylori"[MeSH Terms] OR ("helicobacter"[Title/Abstract] AND "pylori"[Title/Abstract]) OR "helicobacter pylori"[Title/Abstract])
#3. #1 AND #2.

Participant or population Neurodegenerative diseases and control.

Intervention H. pylori infection.

Comparator Non-H. pylori infection.

Study designs to be included Case-control studies, or cohort studies.

Eligibility criteria The criteria for including studies were as follows: (1) Study design: The study must have used case-control studies, or cohort studies; (2) Research topic: The study must evaluate the association between H. pylori infection and neurodegenerative diseases; and (3) Data reporting: The study should provide effect estimates of the association along with their 95% confidence intervals (95% CI).

Information sources PubMed, EmBase, and the Cochrane Library.

Main outcome(s) Neurodegenerative diseases, including Parkinson's Disease, dementia, Alzheimer's Disease, and Multiple Sclerosis.

Quality assessment / Risk of bias analysis The Newcastle-Ottawa Scale (NOS) is a widely used tool for assessing the methodological quality of observational studies.

Strategy of data synthesis We examined the association between H. pylori infection and the risk of PD, dementia, AD, and MS based on the effect estimates and their 95%CIs reported in each study. Subsequently, we used a random-effects model to pool the odds ratios (ORs) and 95%CIs for the impact of H. pylori infection on these neurodegenerative diseases.

Subgroup analysis Subgroup analyses were performed according to country, study design, H. pylori detection, outcome, or study quality, and the differences between subgroups were compared using the interaction t test, which assuming the data met normal distribution.

Sensitivity analysis Sensitivity analyses were also performed to assess the stability of pooled conclusion.

Language restriction No restriction.

Country(ies) involved China.

Keywords Helicobacter pylori infection; neurodegenerative disorders; Parkinson's Disease; dementia; Alzheimer's Disease; Multiple Sclerosis; systematic review; meta-analysis.

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