Wang et al. INPLASY protocol 2025110018. doi:10.37766/inplasy2025.11.0018 Downloaded from https://inplasy.com/inplasy-2025-11-0018/

INPLASY

Association Between Gout and the Risk of Dementia: A Meta-analysis of Observational Studies and Biological Mechanisms

INPLASY2025110018

doi: 10.37766/inplasy2025.11.0018

Received: 7 November 2025

Published: 7 November 2025

Wang, YC; Huang, APH; Huang, CW; Islam, MM; Kung, WM.

Corresponding author:
Woon-Man Kung

nskungwm@yahoo.com.tw

Author Affiliation:
Taipei Medical University.

ADMINISTRATIVE INFORMATION

Support - No financial support.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025110018

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 November 2025 and was last updated on 7 November 2025.

INTRODUCTION

Review question / Objective We aim to determine the potential modifiable risk factors for dementia.

Condition being studied Association Between Gout and the Risk of Dementia.

METHODS

Search strategy Our team searched subsequent electronic databases from database inception to December 1, 2022: PubMed, EMBASE, Scopus, and Web of Science. We also conducted a manual search to obtain relevant studies that were not found in the initial screening. Moreover, we scrutinized the references of the retrieved original articles, reviews, and meta-analyses for determination of further studies that could be utilized.

Participant or population This article analyzed de-identified individual participant data from previously published studies. No new data involving human participants or animals were collected by any of the authors.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Our team executed systematic review with meta-analysis according to Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) reporting guidelines.

Eligibility criteria Eligibility was restricted to observational studies (case-control, cohort, and cross-sectional) which evaluated the relationship of gout with the risk of any kind of dementia as a primary outcome. We included studies if (i) their outcome of interest was the risk of dementia, (ii) they had been published in English, (iii) they

included at least 40 participants and provided clear information regarding selection criteria for gout and dementia, and (iv) they provided effect sizes with 95% confidence intervals (CIs) and adjusted risk factors. Our study excluded abstracts, letters to editors, case reports, short communications, and reviews.

Information sources We included 5 observational researches in our study. The publication year started since 2015 through 2022. Overall, the studies enrolled 227,419 adults with gout who were men and women of all ages. There were 5 cohort studies, which used a standard protocol to select patients with gout and dementia.

Main outcome(s) Based on the evidence from observational studies, our analysis shows that patients with gout are prone to diminish the risk of dementia development.

Quality assessment / Risk of bias analysis Two authors assessed the risk of the basis of each study applying the Newcastle-Ottawa Scale (NOS) separately. They categorized the selected researches into low, moderate, and high risk of bias based on the number of points they received. Moreover, they determined the heterogeneity among study-specific RRs using the Q statistic, the I2 statistic and τ2. We used the Egger's test method to evaluate publication bias.

Strategy of data synthesis We conducted the meta-analysis by using the relevant studies that provided adjusted ORs/HRs of the relationship of gout with overall dementia. We calculated the pooled adjusted RRs with 95% CIs by using the random-effects method. We drew forest plots to present the overall effect size visually. Moreover, we generated a funnel plot to show publication bias. We performed all analyses by using the meta-analysis software.

Subgroup analysis We also carried out subgroup analyses depended on research design along with region. No stratifications affected the overall effect size and the observed heterogeneity among the included studies. Gout was related with a decreased risk of dementia in the cohort studies. However, the reduction in risk of dementia was insignificant. Gout was related to a diminished risk of dementia in parts of studies accomplished in Asia. Analogous trend was noted in Western population, although this was insignificant neither.

Sensitivity analysis Not applicable.

Country(ies) involved Taiwan and United States.

Keywords Gout; Dementia; Alzheimer's disease; Vascular dementia; Meta-analysis.

Contributions of each author

Author 1 - Yao-Chin Wang - Conceptualization, Methodology, Investigation, Writing- Original Draft.
Email: vkwang8888@yahoo.com.tw
Author 2 - Abel Po-Hao Huang - Data Curation, Resources, Validation.
Email: how.how0622@gmail.com
Author 3 - Chih-Wei Huang - Project Administration, Visualization.
Email: gracehuang@tmu.edu.tw
Author 4 - Md. Mohaimenul Islam - Software, Formal Analysis.
Email: 2010rubel@gmail.com
Author 5 - Woon-Man Kung - Validation, Writing-Reviewing and Editing, Supervision.
Email: nskungwm@yahoo.com.tw

Wang et al. INPLASY protocol 2025110018. doi:10.37766/inplasy2025.11.0018 Downloaded from https://inplasy.com/inplasy-2025-11-0018/