INPLASY PROTOCOL

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None declared.

Vitamin D receptor gene polymorphisms and multiple myeloma: A meta-analysis

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Review question / Objective: **Is there an association between VDR gene polymorphisms and the risk of MM?**
Condition being studied: **Vitamin D acts through the vitamin D receptor (VDR), and vitamin D level decreases in multiple myeloma (MM) patients. Single nucleotide polymorphisms (SNPs) in VDR alter VDR functions to affect the vitamin D status. This raises the question of whether VDR gene polymorphisms are associated with MM development, which has been investigated in case-control studies, but the results have been inconsistent.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 March 2023 and was last updated on 11 May 2024 (registration number INPLASY202330076).

INTRODUCTION

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METHODS

Search strategy: The PubMed, Web of Science, Medline, Embase, Chinese National Knowledge Infrastructure (CNKI), Chinese Scientific Journal Database (VIP), and Wanfang Database (WANFANG) were searched from their respective inception to June 1, 2023. The retrieval keywords were "multiple myeloma", "vitamin D receptor", and "polymorphism".

Participant or population: Patients diagnosed with MM.

Intervention: VDR gene polymorphisms.

Comparator: The control group included healthy individuals.

Study designs to be included: Case–control study.

Eligibility criteria: The inclusion criteria were as follows: (i) case-control study. (i) was a case-control study in humans in which the association between VDR polymorphisms and MM risk was investigated; (ii) the case group included patients who meet the diagnostic criteria for MM, and the control group included healthy individuals; (iii) the number of individuals with each genotype in the case and control groups was sufficient to calculate odds ratio (OR) and 95% confidence interval (95% CI); and (iv) the genotype distributions of the control group followed the Hardy–Weinberg equilibrium (HWE). The exclusion criteria were as follows: (i) not a case-control study reporting the association between VDR gene polymorphisms and MM risk; (ii) studies containing data repeated from another published study; (iii) studies containing incomplete data or data that could not be analyzed; (iv) studies with missing or apparently incorrect data; and (v) reviews, case reports, or basic experimental studies.

Information sources: PubMed, Web of Science, Medline, Embase, Chinese National Knowledge Infrastructure (CNKI), Chinese Scientific Journal Database (VIP), and Wanfang Database (WANFANG)

Main outcome(s): Effect of VDR gene polymorphisms associated with MM risk.

Quality assessment / Risk of bias analysis: Literature quality evaluation Newcastle-Ottawa quality Assessment scale (NOS) was adopted to evaluate the quality of the included studies. The NOS consists of three aspects of evaluation: selection, comparability and outcomes between the case group and the control group. The full score was 9 stars, and high quality was defined as a study with ≥7 stars.

Strategy of data synthesis: Data for meta-analysis and sensitivity analysis using the software Comprehensive Meta-Analysis (CMA, version 3.0). All SNPs were in conformation with Hardy-Weinburg equilibrium in control subjects, and trim and fill method was used to test publication bias, which was constructed by using STATA 12.0 (STATA Corporation, Texas, USA). For the assessment of interstudy heterogeneity, the chi-square test and I2 were used. According to whether the homogeneity was low (P≥0.10, I2≤50%) or high (P 50%), we used a fixed- or random-effects model in the meta-analysis. The odds ratio (OR) was used as a summary statistic for dichotomous variables. A confidential interval of 95% (95%CI) was calculated for all mean values. P values that were > 0.05 were considered insignificant.

Subgroup analysis: N/A.

Sensitivity analysis: To explore the source of heterogeneity among studies included in the review, leave-one-out sensitivity analysis was employed in this study, which conducting a meta-analysis on each subset of the studies obtained by leaving out exactly one study.

Language restriction: English and Chinese.

Country(ies) involved: China.

Keywords: multiple myeloma, gene polymorphism, vitamin D receptor, meta-analysis.

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