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Meta-Analysis of Genetic Variants in Alcohol Metabolizing Enzymes and their Association with Colorectal Cancer Risk

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Abstract

Several prospective cohort and case-control studies have provided strong evidence describing an association between alcohol consumption and risk of colorectal cancer (CRC). Studies on the association of ADH1B Arg47His and ALDH2 Glu487Lys variants with CRC risk were inconclusive. In this chapter we aimed to elucidate the genetic associations of the alcohol metabolic enzymes with CRC risk. An organized literature search was performed in PubMed, Embase and Google scholar

bibliographic databases to retrieve various casecontrol studies associated with alcohol metabolism genes and CRC. A meta-analysis was performed based on the random-effect model to calculate the overall association of ADH1B Arg47His and ALDH2 Glu487Lys variants with CRC risk. No association was found between ADH1B and ALDH2 gene polymorphisms and susceptibility of CRC. Stratified analysis by ethnicity also did not reveal a significant association between these variants and CRC risk. Cochrane O-test and I² statistics revealed heterogeneity in association with these variants (P < 0.001). Publication bias tests did not reveal evidence for bias. Thus, ADH1B Arg47His and ALDH2 Glu487Lys genetic variants are not considered as risk factors for CRC.

Keywords

Colorectal cancer Meta-analysis

Alcohol metabolism ADH1B ALDH2

Polymorphism Susceptibility

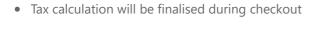
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Abbreviations

ADH: alcohol dehydrogenase

ALDH: aldehyde dehydrogenase

Arg: Arginine

CI: Confidence intervals

CRC: Colorectal cancer

FEM: Fixed effects model

Glu: Glutamic acid

His: Histidine

HWE: Hardy-Weinberg equilibrium

Lys: Lysine

NAD: Nicotinamide adenine dinucleotide

OR: Odds ratio

PRISMA: Preferred reporting items for systematic reviews and meta-analyses

REM: Random effects model

Tyr: Tyrosine References

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Conflict of Interest

There are no conflicts of interests.

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