INPLASY

Prevalence and risk factors of gallbladder polyps: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

INTRODUCTION

*R*eview question / Objective This meta-analysis aims to comprehensively evaluate and summarize the prevalence and risk factors of gallbladder polyps over the past 20 years, and provide relevant evidence and guidance for future screening, prevention, and treatment of gallbladder polyps.

All studies ultimately incorporated into the analysis fulfilled the predefined criteria established according to the PICOS framework: Participants (P): Patients diagnosed with gallbladder polyps (GBP); Intervention (I) /Exposure (E): Not applicable for prevalence analysis. For risk factor analysis, any potential risk factor was considered as the exposure; Comparator (C): Not applicable for prevalence analysis. For risk factor analysis, the comparator was the group without the exposure or with the reference level of the factor; Outcomes (O): prevalence and risk factors of GBP or relevant data could be estimated; and Study design (S): Cross-sectional studies and the baseline data of cohort studies are eligible for prevalence analysis; cohort studies, case-control studies, or cross-sectional studies with multivariable regression are eligible for risk factor analysis. Studies that did not meet these requirements or matched any of the exclusion criteria (studies were before 2000 or without sufficient data) were excluded. When multiple studies focused on the same population, we only included the most comprehensive study.

Condition being studied Gallbladder polyps (GBPs) refer to protruding lesions of the gallbladder wall that extend into the lumen. The prevalence of gallbladder polyps has been gradually increasing in recent years, however, current clinical data are insufficient and low-quality, with the etiology and pathogenesis remaining

complex and unclear, along with diverse risk factors. Further analysis and validation with substantial data are still required to study the causes and risk factors of gallbladder polyps. This meta-analysis aims to comprehensively evaluate and summarize the prevalence and risk factors of gallbladder polyps over the past 20 years, and provide relevant evidence and guidance for future screening, prevention, and treatment of gallbladder polyps.

METHODS

Participant or population Patients diagnosed with Gallbladder polyp and those who did not have gallbladder polyp during the same period.

Intervention Not applicable for prevalence analysis. For risk factor analysis, any potential risk factor was considered as the exposure.

Comparator Not applicable for prevalence analysis. For risk factor analysis, the comparator was the group without the exposure or with the reference level of the factor.

Study designs to be included Cross-sectional studies and the baseline data of cohort studies are eligible for prevalence analysis; cohort studies, case-control studies, or cross-sectional studies with multivariable regression are eligible for risk factor analysis.

Eligibility criteria Studies that did not meet these requirements or matched any of the exclusion criteria (studies were before 2000 or without sufficient data) were excluded.

Information sources Three researchers will conduct searches in PubMed, Web of Science, Embase and Cochrane library databases from 2005 to 2025.

Main outcome(s) 1. Prevalence of GBP: The primary outcome is the pooled prevalence of Gallbladder Polyps (GBP). This will be calculated as a proportion (percentage) with 95% confidence intervals (CIs).
2. Risk factors for GBP: The secondary outcome involves identifying risk factors associated with GBP. The effect measures will be presented as Odds Ratios (OR) or Relative Risks (RR) with 95% CIs. Data will be extracted from the multivariable regression models of included studies where available.prevalence and risk factors of GBP or relevant data could be estimated.

Quality assessment / Risk of bias analysis For studies reporting prevalence data, the JBI Checklist for Studies Reporting Prevalence Data (9 items) was used. Studies scoring ≤5, 6–7, and ≥8 were classified as low, medium, and high quality, respectively, with two reviewers independently scoring each study based on the predefined domains. Discrepancies and uncertainties in scoring were resolved through discussion with the corresponding author (Xiaoyu Wen).The quality of cohort studies was assessed using the JBI Critical appraisal tools, which evaluate 9 domains. Studies scoring ≤5, 6–7, and ≥8 were classified as low, medium, and high quality, respectively. With two reviewers independently scoring each study based on the predefined domains. Discrepancies and uncertainties in scoring were resolved through discussion with the corresponding author (Xiaoyu Wen).

Strategy of data synthesis Statistical analyses were performed using R software (version 4.5.2)[4]. The meta-analysis was conducted with the meta package (version 8.2.1). Heterogeneity across studies was assessed using the I^2 statistic, $I^2 > 50\%$ indicating substantial heterogeneity[5]. A random effects model was used where substantial heterogeneity occurs; otherwise, the fixed effect model was used. To assess the risk factors of gallbladder polyps, the odds ratios (ORs) and associated 95% confidence intervals (CIs) were extracted from included studies.

Subgroup analysis To explore potential sources of heterogeneity, subgroup analyses and meta-regression analyses were performed. Subgroup analyses were stratified by study year, geographic region, income level, gender ratio, and quality score. Meta-regression analyses included continuous variables such as mean age, gender ratio, and GBP size.

Sensitivity analysis Publication bias was assessed using funnel plots and Egger's test[6]. Sensitivity analyses were conducted by sequentially excluding individual studies to evaluate the robustness of the pooled estimates.

Country(ies) involved China.

Keywords gallbladder polyps, prevalence, risk factors, meta-analysis.

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