

Artificial Intelligence for the Automatic Diagnosis of Gastritis: A Systematic Review

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INTRODUCTION

Review question / Objective The purpose of this systematic review is to offer an extensive overview of actual AI applications and analyze the precision of these systems to make an automatic diagnosis of gastritis.

Condition being studied Gastritis is a gastric inflammatory disease associated with the injury of the mucosa. It is a histological entity, not a clinical one, given that most people with microscopic inflammation of the stomach are asymptomatic. Diagnosis of gastritis is made on clinical, endoscopic, and histological criteria. Patients with gastritis may present dyspeptic syndrome, anemic syndrome, or UGI bleeding, or they may be asymptomatic. UGI endoscopy, mandatory for diagnosing gastritis, alongside the biopsy, offering the histopathological report, is the gold standard for diagnosing the inflammation of the gastric mucosa.

METHODS

Search strategy This systematic review was carried out according to the PRISMA guidelines for systematic reviews. PubMed, Cochrane Library, EMBASE, and WILEY databases were thoroughly screened for significant publications concerning the use of AI in the automatic diagnosis of gastritis. The relevant search of words included: gastritis AND (artificial intelligence OR deep learning OR neural network OR machine learning OR computeraided diagnosis OR automated diagnosis OR automated gastric endoscopy OR digital pathology OR automated ultrasound OR automated X-Ray). Exclusion criteria consisted of: studies written in another language than English, abstracts, animal studies, pediatric studies, case reports, editorials, letters to the editor, and conference publications.

Participant or population Patients with different types of gastritis in various clinical settings.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Observational studies.

Eligibility criteria Publications analyzing the use of AI in the automatic diagnosis of gastritis were included.

Information sources PubMed, Cochrane Library, EMBASE, and WILEY databases.

Main outcome(s) The outcomes were represented by the accuracy, sensitivity, and specificity of the included algorithms in diagnosing various types of gastritis.

Quality assessment / Risk of bias analysis The Newcastle-Ottawa Scale (NOS) was employed to assess the risk of bias for observational studies. The quality assessment was independently conducted by two reviewers, and any discrepancies were resolved through consensus.

Strategy of data synthesis Due to the anticipated heterogeneity among the included studies, a metaanalysis was not deemed appropriate. Therefore, a narrative synthesis approach was used to summarize the findings, and relevant data were presented in tabular format. We conducted a qualitative synthesis of all included studies.

Subgroup analysis Subgroup analysis was conducted in accordance with the available data from the extracted data from the included studies, such as type of gastritis, additional diagnoses, symptomatology, and sex.

Sensitivity analysis No sensitivity analysis was conducted in our systematic review.

Language restriction Only studies published in English have been included in our systematic review.

Country(ies) involved Romania.

Keywords Gastritis, artificial intelligence, gastroenterology, automatic diagnosis.

Dissemination plans Publication in a peer reviewed journal.

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