Inflammatory bowel disease (IBD) is a chronic, relapsing-remitting disease of the gastrointestinal tract, that includes ulcerative colitis, Crohn's disease, and unclassified IBD. In this study, Swedish authors investigated the risk of overall and specific cardiac arrhythmias in patients with biopsy-confirmed IBD.

Similar to other immune-mediated inflammatory diseases, such as rheumatoid arthritis and psoriasis, IBD has been linked to increased cardiovascular disease morbidity and mortality, including stroke, ischemic heart disease, and venous thromboembolism. Some previous studies investigated the association between IBD and arrhythmias, but, the findings were inconclusive. It remains unclear whether IBD is a risk factor for overall and specific arrhythmias.

About the study

To explore the risk of overall and specific arrhythmias in patients with biopsy-confirmed IBD, the authors conducted a study based on the Swedish nationwide histopathology register. Patients with IBD were identified as those with at least one International Classification of Disease code for IBD in the Swedish National Patient Register and one biopsy record indicating IBD from 1969 to 2017. The control group included matched individuals and full siblings, who had to be alive, and free of IBD or cardiac arrhythmias at the time of selection.

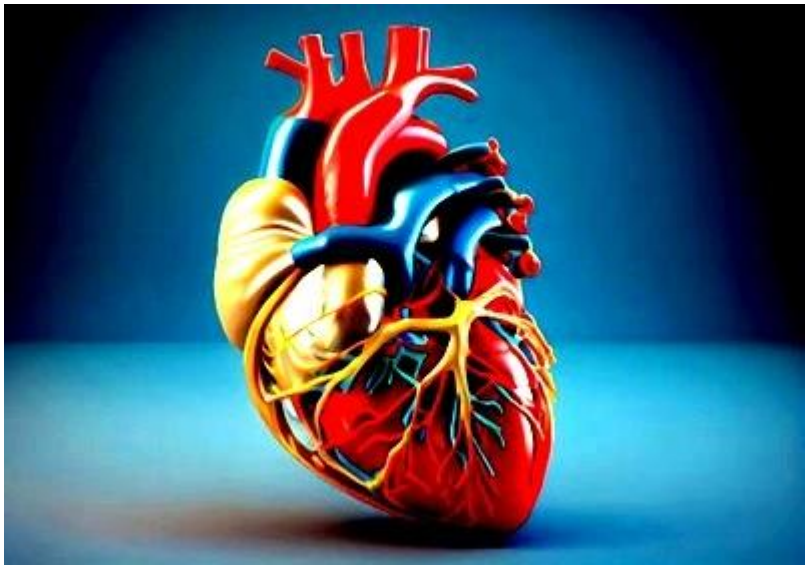
Outcomes included overall and specific arrhythmias, such as atrial fibrillation/flutter, bradyarrhythmias, supraventricular arrhythmias, and ventricular arrhythmias/cardiac arrest. The risk of overall arrhythmia was calculated by gender, age (<18, 18 to 39, 40 to 59, and ≥60 years), calendar period (1969 to 1989, 1990 to 1999, 2000 to 2009, and 2010 to 2019), and the number of healthcare visits (0, 1, 2 to 3, and ≥4).

Results

The study included patients diagnosed with Crohn's disease (*n*= 24,954), ulcerative colitis (*n*= 46,856), and unclassified IBD (*n*= 12,067), matched reference individuals and IBD-free full siblings. Patients with IBD had a higher prevalence of other previous diseases, such as ischemic heart disease, heart failure, stroke, hypertension, diabetes, obesity, dyslipidemia, chronic kidney disease, and COPD, compared with control individuals.

Cardiac arrhythmias were found in 7.6% of patients with Crohn's disease (n=1,904), 8.9% of patients with ulcerative colitis (n=4,154), and 8.2% of patients with unclassified IBD (n=990 patients), compared with 6.7%, 7.5%, and 6.0% of matched reference subjects during a follow-up period of approximately ten years.

Notably, the highest relative risk of cardiac arrhythmias was observed shortly after the diagnosis of IBD.



The incidence of arrhythmias was increased in patients with Crohn's disease, patients with ulcerative colitis, and patients with unclassified IBD, compared with reference individuals. The increased risk of developing arrhythmias in patients with IBD persisted for over 25 years after diagnosis of IBD.

Patients with IBD also had a higher risk of specific tachyarrhythmias, such as atrial fibrillation/flutter, other supraventricular arrhythmias, and ventricular arrhythmias/cardiac arrest. There was no significantly increased risk for bradyarrhythmias. The authors stated that the results of an increased risk of atrial fibrillation/flutter in patients with IBD are consistent with previous findings.

Conclusion

This study has shown that the long-term risk of developing cardiac arrhythmias was increased in patients with IBD, except for bradyarrhythmias. The increased risk of developing arrhythmias in patients with IBD persisted for over 25 years after diagnosis of IBD.

The authors speculated that chronic systemic inflammatory activation seems to be the key component linking IBD to arrhythmias. Inflammatory cytokines, particularly tumor necrosis factor, interleukin (IL)-1, and IL-6 exert arrhythmogenic effects, directly affecting cardiac structural and electrical changes. They also indirectly affect the function of other systems (e.g., liver, adipose, and nervous tissue). Increased levels of C-reactive protein have been linked to atrial fibrillation and thromboembolic complications. As suggested in previous investigations, elevated oxidative stress, platelet and endothelial dysfunction, hypercoagulability, and alterations in the gut microbiota could be other possible contributors.

The authors noted that, to their knowledge, this study is the first to examine the long-term risk of newly diagnosed specific cardiac arrhythmias (except for atrial fibrillation) in patients with IBD. Healthcare professionals should be aware that patients with IBD, such as those with other extraintestinal manifestations, have a higher long-term risk of arrhythmias (in terms of absolute risk). The risk of cardiovascular diseases should be considered for

these patients.

In conclusion, a better understanding of the link between IBD and arrhythmias is imperative, as arrhythmias have been associated with an increased risk of cardiovascular diseases, which are the leading cause of mortality worldwide.

This article was published in PLoS Med.

Journal Reference

Sun J, et al. (2023) Long-term risk of arrhythmias in patients with inflammatory bowel disease: A population-based, sibling-controlled cohort study. PLoS Med 20(10): e1004305. (Open Access)

https://doi.org/10.1371/journal.pmed.1004305