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META-ANALYSIS

Safety and efficacy of colchicine for the prevention of post-operative atrial fibrillation in patients undergoing cardiac surgery: a meta-analysis of randomized controlled trials

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Background and Aims Colchicine is an anti-inflammatory drug that may prevent post-operative atrial fibrillation (POAF). The effect of this drug has been inconsistently shown in previous clinical trials. We aimed to compare the efficacy and safety of colchicine vs. placebo to prevent POAF in patients undergoing cardiac surgery.

Methods and results A systematic search of EMBASE, MEDLINE, SCOPUS, ClinicalTrials.gov, and the Cochrane Library for randomized controlled trials (RCTs) was conducted from inception till April 2023. The primary outcome was the incidence of POAF after any cardiac surgery. The secondary outcome was the rate of drug discontinuation due to adverse events and adverse gastrointestinal events. Risk ratios (RR) were reported using the Mantel Haenszel method. A total of eight RCTs comprising 1885 patients were included. There was a statistically significant lower risk of developing POAF with colchicine vs. placebo (RR: 0.70; 95% CI: 0.59–0.82; $P < 0.01$, $I^2 = 0\%$), and this effect persisted across different subgroups. There was a significantly higher risk of adverse gastrointestinal events (RR: 2.20; 95% CI: 1.38–3.51; $P < 0.01$, $I^2 = 55\%$) with no difference in the risk of drug discontinuation in patients receiving colchicine vs. placebo (RR: 1.33; 95% CI: 0.93–1.89; $P = 0.11$, $I^2 = 0\%$).

Conclusion This meta-analysis of eight RCTs shows that colchicine is effective at preventing POAF, with a significantly higher risk of adverse gastrointestinal events but no difference in the rate of drug discontinuation. Future studies are required to define the optimal duration and dose of colchicine for the prevention of POAF.

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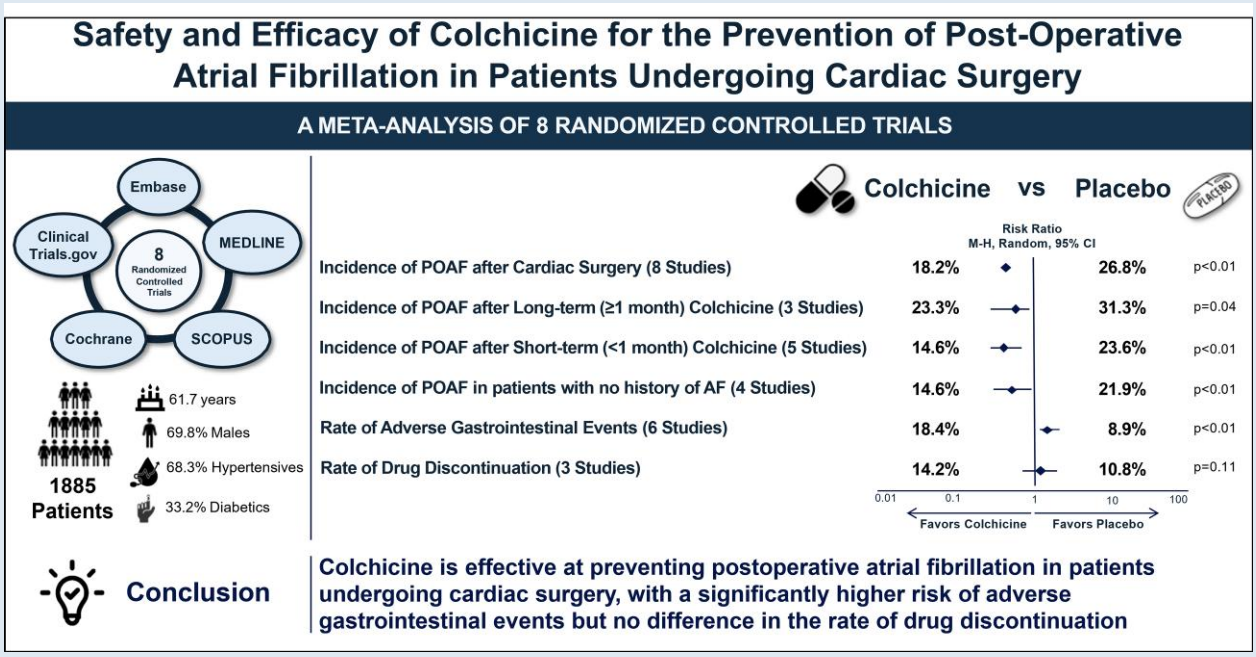
Graphical Abstract



Keywords Atrial fibrillation • Colchicine • Meta-analysis • Outcomes

What's New

- Approximately 16–50% of patients undergoing cardiothoracic surgery develop post-operative atrial fibrillation.
- This meta-analysis of eight randomized controlled trials, including 1885 patients undergoing any cardiac surgery, demonstrated that colchicine was associated with a 30% relative risk reduction in the incidence of post-operative atrial fibrillation.
- This protective effect of colchicine was consistently seen in different subgroups based on the duration of colchicine treatment and in patients with no history of atrial fibrillation before the procedure.
- Patients receiving colchicine had a significantly higher risk of adverse gastrointestinal events with no difference in the rate of drug discontinuation.

Introduction

Approximately 16–50% of patients undergoing cardiac surgery develop post-operative atrial fibrillation (POAF).[1] The POAF is typically characterized by often brief, paroxysmal, and asymptomatic episodes, with a peak incidence between 2 and 4 days after surgery and frequent recurrences, especially during the first post-operative week.[2] The POAF is associated with an increased risk of thromboembolism, stroke, cardiac decompensation, hospitalizations, and a higher cost of care.[1,2]

Colchicine has been tested and evaluated in several randomized clinical trials (RCTs) to prevent POAF in patients undergoing cardiac surgery. However, given the small sample sizes, different dosing strategies, and variability in study endpoints, these clinical trials have shown inconsistent and conflicting effects with colchicine. As a result, clinical practice guidelines have considerable heterogeneity in their recommendations regarding colchicine use in this clinical setting. The 2019 American College of Cardiology AF guidelines[3] suggests that colchicine may be considered to prevent POAF (Class IIb, Level of Evidence B), whereas the 2020 European Society of Cardiology AF guidelines states that the data for the use of colchicine is not robust.[4] Similarly, the 2017 Heart Rhythm Society expert consensus statement on catheter and surgical ablation of atrial fibrillation[5] does not give any concrete recommendations on colchicine use in this patient population. Therefore, the benefit of colchicine in preventing POAF remains unclear.

In order to increase sample size and decrease the variability of the effect estimate, we performed a systematic review and meta-analysis of RCTs to develop a large enough cohort to adequately examine the efficacy and safety of colchicine for the prevention of POAF.

Methods

This systematic review and meta-analysis were performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses report guidelines.[6,7]

Data sources and search

A systematic search was performed using EMBASE/Ovid, PubMed/MEDLINE, SCOPUS, ClinicalTrials.gov, and the Cochrane Library from inception till May 2023 by two independent researchers. The search terms included 'atrial fibrillation' and 'colchicine' (see Supplementary material online, *Tables S1–S4*). In addition, we manually reviewed the bibliography of included studies to ensure the complete inclusion of all relevant studies.

Study selection

All retrieved titles and abstracts were independently reviewed by two authors. Full-length articles were reviewed for all potential studies, and any discrepancies were resolved after discussion with the senior author. Full-length articles and supplements of all included studies were reviewed, and data regarding baseline characteristics of the patient population and outcomes of interest were abstracted on a structured data collection form.

Quality assessment and data extraction

Studies were included if they met the following criteria: (i) human subjects with age ≥18 years; (ii) compared colchicine vs. placebo or no other drug in preventing POAF in patients undergoing any cardiac surgery (coronary artery bypass graft and/or any valvular surgery); (iii) published in a peer-reviewed journal; (iv) at least one outcome of interest was reported; and (v) randomized controlled trials. No restrictions were applied regarding the sample size, follow-up duration, or characteristics of the patient population. Studies were excluded if: (i) they did not report outcomes of interest; (ii) they are single-arm studies; and (iii) they follow observational study design.

We abstracted the title, year of publication, sample size, length of follow-up, gender, history of atrial fibrillation (AF), duration of treatment, and clinical outcomes, including the incidence of POAF from the included studies. The quality of included RCTs was assessed using the Cochrane risk of bias assessment tool for RCTs.[8] We assessed the risk of bias at the study level across the following domains: bias due to the randomization process, bias due to deviation from the intended intervention, bias due to missing outcome data, bias in the measurement of the outcomes, and bias in the selection of the reported results, including divergence from the registered protocol or owing to early termination for benefit.

Outcome measures

Outcomes were compared between colchicine vs. placebo or no drug. The primary outcome was the incidence of POAF. Atrial fibrillation was defined as clinically significant AF or documented episode of AF lasting at least 30 s following any cardiothoracic surgery. The secondary outcome included the rates of drug discontinuation and adverse gastrointestinal events (nausea, vomiting, or diarrhoea). Subgroup analysis was performed based on the duration of colchicine use (long-term use ≥1 month or short-term use <1 month) and control arm (placebo vs. no drug). We also performed a sensitivity analysis in patients with no history of AF.

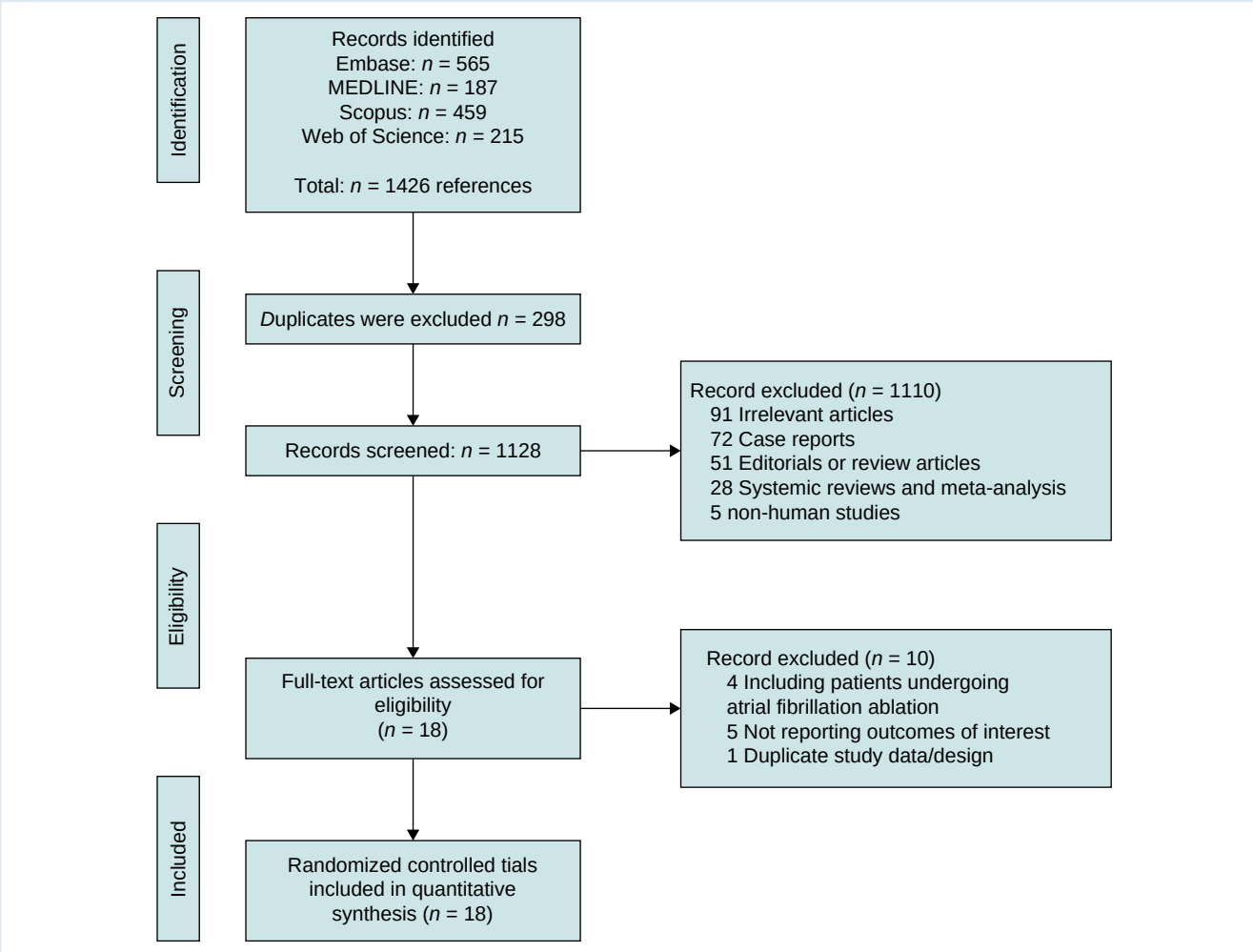


Figure 1 Systematic search for study selection.

Table 1 Baseline characteristics of patients in the included randomized controlled trials

Study	Patients (*n*)	Year	Type of intervention	Male (%)	Age (mean)	AF (%)	CHF (%)	CAD (%)	HTN (%)	DM (%)	BMI (mean)	Dose of Colchicine	Follow-up (months)
Imazio *et al.* [15]	Colchicine ($n = 169$)	2011	CABG (53.8) Aortic surgery (25.4) Valvular Surgery (2.4) Combined Surgery (16.6) Other (1.8)	69.8	NR	4.7	10.7	NR	68.1	20.1	NR	Colchicine 1 mg twice daily starting on post-op day 3 followed by a maintenance dose of 0.5 mg twice daily for 1 month in patients that were at least 70 kg. Halved doses were used for patients under 70kg or intolerant to the higher doses.	1
	Placebo ($n = 167$)		CABG (45.5) Aortic surgery (29.3) Valvular Surgery (4.2) Combined Surgery (19.2) Other (1.8)	67.1	NR	6.6	13.2	NR	69.5	25.7	NR		
Imazio *et al.* [13]	Colchicine ($n = 180$)	2014	CABG (35.0) Aortic surgery (6.1) Valvular Surgery (34.4) Combined Surgery (24.5)	73.9	67.0	10.0	NR	NR	67.2	21.1	NR	0.5 mg of colchicine twice daily in patients that weigh 70kg or more. 0.5 mg once daily in patients that weighed less than 70 kg Interventions started 48–72 h prior to surgery and continued one month after surgery	3
	Placebo ($n = 180$)		CABG (32.8) Aortic surgery (6.1) Valvular Surgery (38.3) Combined Surgery (22.8)	63.9	68.0	8.3	NR	NR	67.8	23.3	NR		
Sarzaeem *et al.* [16]	Total ($n = 216$)	2014	CABG	NR	NR	NR	NR	NR	NR	NR	NR	1 mg of colchicine the night before surgery and on the morning of surgery then 0.5 mg twice a day for 5 days after surgery	In-hospital stay
Tabbalat *et al.* [17]	Colchicine ($n = 179$)	2016	CABG (72.6) Other (27.4)	78.8	60.8	0	5.0	25.7	67.0	52.0	28.3	2 mg of colchicine was given 12–24 h prior to surgery then 1 mg 4 h before or immediately after surgery then continued at 0.5 mg twice daily until hospital discharge. Patients weighing less than 70 kg or that didn't tolerate the full dose were given half the dose.	In-hospital stay
	No Colchicine ($n = 181$)		CABG (66.3) Other (33.7)	79	60.5	0	8.3	21.5	61.9	47.0	27.5		
Zarpelon *et al.* [14]	Colchicine ($n = 71$)	2016	CABG	69.0	61.5	0	NR	29.6	88.7	59.2	NR	1 mg of colchicine twice daily pre-operatively and then 0.5 mg twice daily until hospital discharge. A single dose of 1 mg was given to those that were admitted 12 h prior to surgery.	In-hospital stay
	Control ($n = 69$)		CABG	66.7	60.3	0	NR	20.3	88.4	43.5	NR		

Continued

Table 1 *Continued*

Study	Patients (*n*)	Year	Type of intervention	Male (%)	Age (mean)	AF (%)	CHF (%)	CAD (%)	HTN (%)	DM (%)	BMI (mean)	Dose of Colchicine	Follow-up (months)
Tabbalat *et al.* [12]	Colchicine ($n = 81$)	2020	CABG (65.1)	71.6	59.0	0	NR	18.5	55.6	39.5	29.3	1 mg dose of colchicine 12 to 24 h prior to surgery followed by a daily dose of 0.5 mg until hospital discharge	In-hospital stay
	Placebo ($n = 71$)		Other (34.9)	81.7	59.8	0	NR	26.8	62.0	49.3	29.3		
Mashayekhi *et al.* [18]	Colchicine ($n = 29$)	2020	CABG (93.2) Valvular Surgery (6.8)	42.3	64.1	NR	NR	21.6	69.4	25.0	27.6	1 mg twice per day for the first day after surgery followed by 1 mg daily in patients that weigh 70 kg or more or 0.5 mg once daily in patients that weigh less than 70 kg	6
	Placebo ($n = 52$)		CABG (96.2) Valvular Surgery (3.8)	43.1	59.2	NR	NR	19.3	67.2	22.7	26.3		
Shvartz *et al.* [11]	Colchicine ($n = 113$)	2022	CABG and/or AVR	73.5	62.0	0	NR	40.7	88.5	24.7	29.0	1 mg of colchicine 24 h prior to surgery and on post-op days 2, 3 ,4, and 5.	0.25
	Placebo ($n = 127$)		CABG and/or AVR	76.4	61.0	0	NR	40.0	93.7	19.0	29.0		

AF, atrial fibrillation/flutter; CHF, congestive heart failure; CAD, coronary artery disease; HTN, hypertension; DM, diabetes mellitus; BMI, body mass index; CABG, coronary artery bypass graft; NR, not reported.

Statistical analysis

The Mantel–Haenszel method for dichotomous data was used to calculate the 95% Confidence Interval (CI) and risk ratio (RR). The Mantel–Haenszel method was used to calculate the combined 95% confidence interval (CI) and risk ratio (RR) across multiple studies included in the meta-analysis. The random-effects model approach accounted for heterogeneity across the studies included. The proportion of total variability in the estimates was summarized with the I^2 index.[9] Heterogeneity was considered high when $I^2 > 50\%$. Statistical analysis was performed using the Review Manager (Version 5.4, Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014) and MAGICapp (www.magicapp.org) for all analyses. All outcomes were assessed according to the intention-to-treat principle.

Certainty of the evidence

We rated the certainty of evidence (COE) using the grading of recommendations assessment, development, and evaluation approach (https://gdt.gradepro.org/app/),[10] as high, intermediate, low, or very low (*Table 2*).

Results

A total of 1426 studies were identified through comprehensive database searching (*Figure 1*). A total of 18 studies were reviewed in full-text, and eight RCTs[11–18] comprising 1885 patients met the inclusion criteria after excluding editorials, review articles, single-arm studies, or non-human studies. The mean age of the patients was 61.7 years with 69.8% males. Hypertension and diabetes were found in 68.3% and 33.2% of patients, respectively. The baseline characteristics of included patient populations are reported (*Table 1*). The risk of bias assessment, study characteristics (see Supplementary material online, *Table S5*), sensitivity analysis (see Supplementary material online, *Table S6*) and funnel plots for publication bias assessment (see Supplementary material online, *Figures S7–S9*) are presented in the data supplement.

Incidence of post-operative atrial fibrillation after any cardiac surgery

In total, eight studies reported the impact of colchicine vs. placebo on the incidence of POAF in patients undergoing cardiac surgery.[11–18] The POAF was observed in 169 (18.2%) among 930 patients receiving colchicine compared to 256 (26.8%) among 955 patients receiving a placebo. The pooled estimate showed a statistically significant lower risk of developing POAF in those receiving colchicine as compared to placebo (RR: 0.70; 95% CI: 0.59–0.82; $P < 0.01$, $I^2 = 0\%$) (COE: high certainty) (*Figure 2*).

Subgroup analysis was also performed based on the duration of colchicine use. In total, three studies reported the efficacy of colchicine vs. placebo for the prevention of POAF with long-term use of ≥1 month.[13,15,18] The POAF was observed in 88 (23.3%) of 378 patients receiving colchicine compared to 125 (31.3%) out of 399 patients receiving the placebo. The pooled estimate showed a statistically significant lower risk of developing POAF in those receiving colchicine for ≥1 month as compared to placebo (RR: 0.74; 95% CI: 0.56–0.99; $P = 0.04$, $I^2 = 21\%$) (see Supplementary material online, *Figure S2*). In total, five studies reported the impact of colchicine vs. placebo with <1 month use of colchicine.[11,12,14,16,17] The POAF was observed in 81 (14.6%) of 552 patients receiving colchicine compared to 131 (23.6%) out of 556 patients receiving the placebo. The pooled estimate showed a statistically significant lower risk of developing POAF with

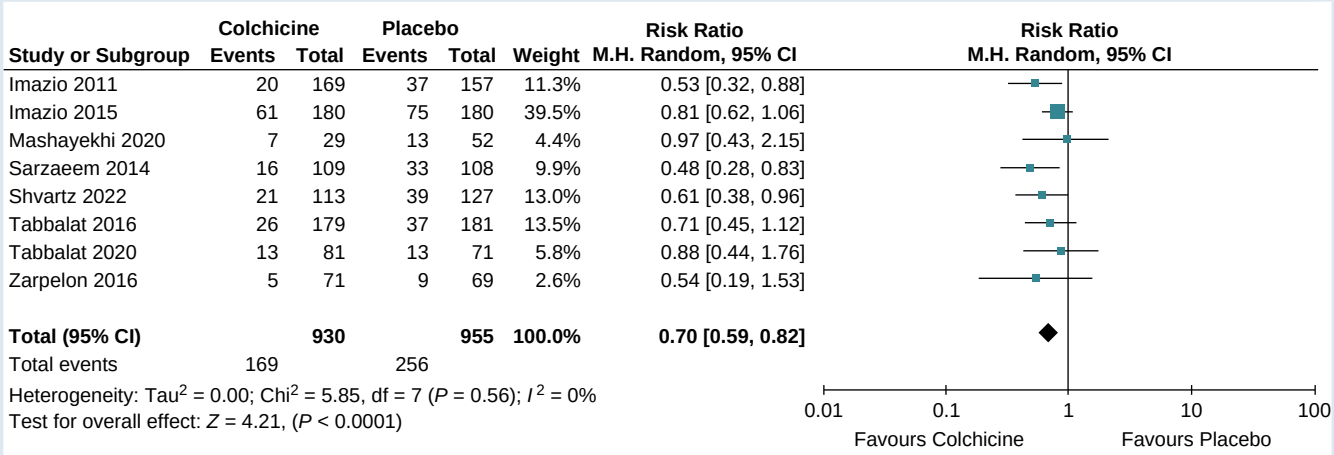


Figure 2 Forest plot for risk of post-op atrial fibrillation in patients undergoing cardiac surgery receiving colchicine vs. placebo.

Table 2 GRADE chart for the certainty of the evidence for the efficacy and safety of colchicine for the prevention of postoperative atrial fibrillation in patients undergoing cardiac surgery

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence (Quality of evidence)
Timeframe		**Placebo**	**Colchicine**	
Post-operative atrial fibrillation	Relative risk: 0.7 (CI 95% 0.59–0.82) Based on data from 1885 participants in 8 studies[a]	**268** per 1000	**188** per 1000 Difference: **80 fewer per 1000** (CI 95% 110 fewer—48 fewer)	High
Discontinuation due to adverse events	Relative risk: 1.33 (CI 95% 0.93–1.89) Based on data from 848 participants in 3 studies[b]	**108** per 1000	**144** per 1000 Difference: **36 more per 1000** (CI 95% 8 fewer—96 more)	Moderate Due to serious imprecision[c]
Adverse gastrointestinal events	Relative risk: 2.2 (CI 95% 1.38–3.51) Based on data from 1529 participants in 6 studies[d]	**90** per 1000	**198** per 1000 Difference: **108 more per 1000** (CI 95% 34 more—226 more)	High

Bold values showing the risk difference.
Population: patients undergoing cardiac surgery
Intervention: Colchicine
Comparator: Placebo
[a]Systematic review [1] with included studies: Imazio (2011), Imazio (2014), Tabbalat (2020), Zarpelon (2016), Mashayekhi (2020), Sarzaeem (2014), Shvartz (2022), Tabbalat (2016). **Baseline/comparator** Control arm of reference used for intervention.
[b]Systematic review [1] with included studies: Tabbalat (2020), Imazio (2011), Imazio (2014). **Baseline/comparator** Control arm of reference used for intervention.
[c]**Imprecision: serious.** Wide confidence intervals.
[d]Systematic review [1] with included studies: Shvartz (2022), Tabbalat (2016), Tabbalat (2020), Imazio (2011), Imazio (2014), Mashayekhi (2020). **Baseline/comparator** Control arm of reference used for intervention.

colchicine as compared to placebo (RR: 0.63; 95% CI: 0.49–0.81; $P < 0.01$, $I^2 = 0\%$) (see Supplementary material online, *Figure S1*).

Sensitivity analysis was also performed in patients with no prior history of AF. In total, four studies reported the impact of colchicine vs. placebo on the incidence of POAF in patients with no history of AF before the cardiac procedure.[11,12,14,17] The POAF was observed in 65 (14.6%) of 444 patients receiving colchicine compared to 98 (21.9%) out of 448 patients receiving the placebo. The pooled estimate showed a statistically significantly lower risk of developing POAF in those receiving colchicine than those receiving placebo (RR: 0.68;

95% CI: 0.51–0.90; $P < 0.01$, $I^2 = 0\%$) (see Supplementary material online, *Figure S3*).

Rate of drug discontinuation with colchicine vs. Placebo

In total, 3 studies reported the rate of drug discontinuation in patients receiving colchicine vs. placebo.[12,13,15] Discontinuation of the drug was observed in 61 (14.2%) of 430 patients receiving colchicine compared to 45 (10.8%) out of 418 patients receiving the placebo. Although numerically higher, this difference in the risk of drug discontinuation in those receiving colchicine as compared to placebo did not reach statistical significance (RR: 1.33; 95% CI: 0.93–1.89; $P = 0.11$, $I^2 = 0\%$) (COE: moderate certainty) (*Figure 3*).

Rate of adverse gastrointestinal events with colchicine vs. Placebo

In total, six studies reported the rate of adverse gastrointestinal events in patients receiving colchicine vs. placebo.[11–13,15,17,18] Adverse gastrointestinal events were observed in 138 (18.4%) of 751 patients receiving colchicine compared to 70 (8.9%) out of 778 patients receiving the placebo. The pooled estimate showed a statistically significant higher risk of adverse gastrointestinal events in those receiving colchicine as compared to placebo (RR: 2.20; 95% CI: 1.38–3.51; $P < 0.01$, $I^2 = 55\%$) (COE: high certainty) (*Figure 4*).

Subgroup analysis was also performed based on the duration of colchicine used. In total, three studies reported the efficacy of colchicine vs. placebo for the prevention of POAF with long-term use of ≥1 month.[13,15,18] The pooled estimate showed a statistically significant higher risk of developing adverse gastrointestinal events in those receiving colchicine for ≥1 month as compared to placebo (RR: 2.29; 95% CI:1.41–3.72; $P < 0.01$, $I^2 = 0\%$) (see Supplementary material online, *Figure S5*). In total, three studies reported the impact of colchicine vs. placebo with <1 month use of colchicine.[11,12,17] The pooled estimate showed no difference in the risk of developing adverse gastrointestinal events with colchicine as compared to placebo (RR: 2.03; 95% CI: 0.76–5.46; $P = 0.16$, $I^2 = 81\%$) (see Supplementary material online, *Figure S6*). Additionally, there was a significantly higher risk of adverse gastrointestinal events in patients receiving colchicine vs. no drug in the control arm as compared to those receiving colchicine vs. placebo in the control arm (see Supplementary material online, *Figure S4*).

Risk of bias assessment and sensitivity analysis

Overall, one trial presents a high risk of overall bias due to some concerns for bias arising from missing outcome data, bias in the measurement of outcome, and bias in the selection of reported results.[16] Two trials[14,17] present some concerns for bias due to deviations from the intended intervention, and one trial[11] presents some concerns for bias due to missing outcome data (*Figure 5*). We also conducted a sensitivity analysis by removing each study in turn (see Supplementary material online, *Table S6*). The overall effect of the estimate did not change significantly after excluding individual studies and is therefore not dependent upon a single study.

Discussion

In this meta-analysis of eight RCTs, including 1885 patients undergoing any cardiac surgery, we compared the efficacy and safety of colchicine vs. placebo.

The significant findings of this analysis are as follows:

(1) Colchicine was associated with a 30% relative risk reduction in the incidence of POAF in patients undergoing cardiac surgery. This protective effect of colchicine was consistently seen in different subgroups based on the duration of colchicine treatment and in patients with no history of AF before the procedure.
(2) Patients receiving colchicine had a significantly higher risk of adverse gastrointestinal events (18.4% vs. 8.9%, $P < 0.01$) with no difference in the rate of drug discontinuation compared to placebo.

The pathophysiology of POAF is still not completely understood, although inflammation plays an essential role in the initiation and maintenance of AF as suggested by studies demonstrating the presence of a dose response relationship between serum c-reactive protein and development of POAF.[19–22] Additionally, multiple studies have demonstrated the presence of certain modifiable and non-modifiable conditions that have been shown to predict the risk of POAF.[23,24] These have been divided into pre-operative predictors (including atrial myocardial expression of microRNAs, pre-operative intra-atrial impulse conduction delays and functional impairments of the left atrium and left ventricle on transthoracic echocardiogram, advanced age, hypertension, obesity, obstructive sleep apnoea, chronic kidney disease, and Caucasian ethnicity), intra-operative predictors (including use of cardiopulmonary bypass, duration of aortic cross-clamping, and the number of procedures), and post-operative predictors (including time spent on a ventilator, length of intensive care unit stay, and use of ionotropic support).[23,24]

In the last few years, many trials have investigated the role of anti-inflammatory agents in preventing POAF, using treatments such as corticosteroids, intravenous magnesium, atorvastatin, and colchicine.[19,20] Colchicine is an alkaloid with potent anti-inflammatory properties and has been shown to be of substantial clinical value in multiple cardiovascular conditions including recurrent pericarditis, myocardial infarction, stroke, arrhythmias, and heart failure.[25–27] It exerts its anti-inflammatory role by inhibiting microtubule depolymerization, which at the same time negatively affects the phosphorylation of calcium channels, further decreasing the possibility of calcium overload-induced tachyarrhythmias.[28,29] Polymerization of microtubules is known to be related to myocardial ion handling and arrhythmogenesis; therefore, there is a possibility that the anti-mitotic action of colchicine also plays a role in its protective effect on POAF.[20]

In our meta-analysis, the dose and the duration of colchicine in the included RCTs were highly variable ranging from 0.5 mg once a day until hospital discharge to 1 mg once a day until 6 months. Although our pooled analysis demonstrated that patients receiving colchicine had a higher rate of adverse gastrointestinal events, the rate of drug discontinuation was similar to that compared to placebo. Additionally, our subgroup analysis showed that a short duration of colchicine use (<1 month use) was associated with a significantly lower risk of POAF with no difference in the risk of adverse gastrointestinal events. Our results are similar to the END-AF Low Dose trial,[12] which demonstrated that a regimen of 1 mg of colchicine pre-operatively followed by 0.5 mg daily post-operatively until hospital discharge was well tolerated with similar rates of treatment discontinuation of the drug in both arms. Of note, their study did not demonstrate any difference in the rates of POAF in patients receiving colchicine compared to placebo, likely due to the early termination of the trial.[12] Low-dose colchicine (0.5 mg) has been previously tested in several settings for preventing different cardiovascular diseases, including acute coronary syndrome, out-of-hospital cardiac arrest, and ischaemic stroke, and appears to be better tolerated with similar efficacy.[30] Our study findings add to the current body of literature, suggesting that low-dose colchicine might also be safe and effective in preventing POAF.

Our meta-analysis has several limitations. First, this is a study-level analysis as aggregate data was extracted from original publications,

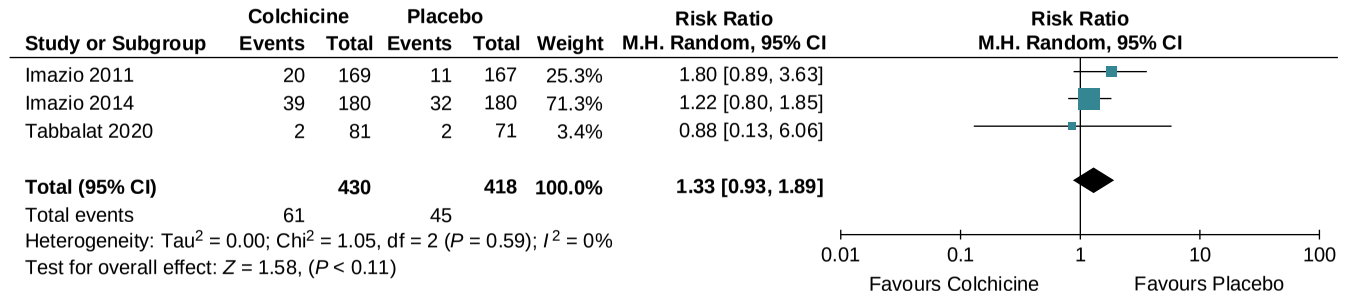


Figure 3 Forest plot for risk of drug discontinuation in patients undergoing cardiac surgery receiving colchicine vs. placebo.

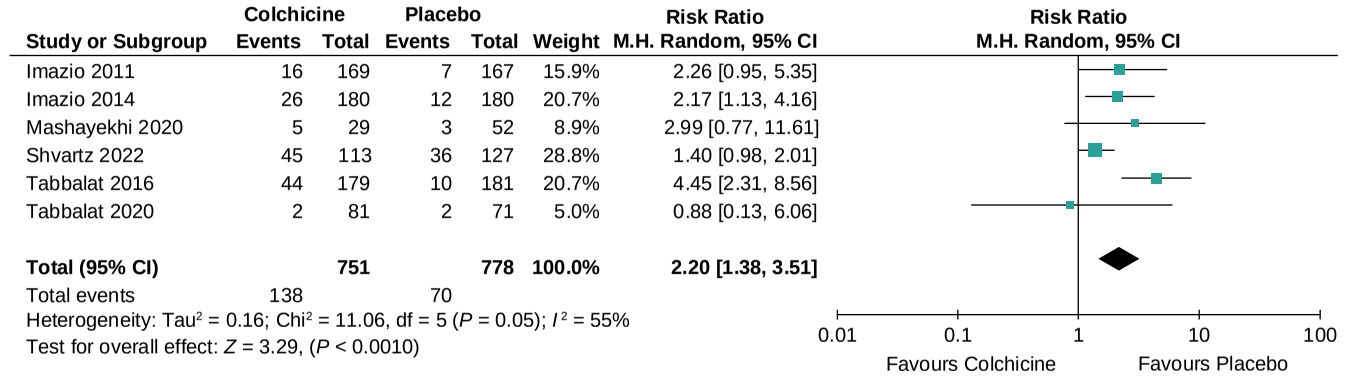


Figure 4 Forest plot for risk of adverse gastrointestinal events in patients undergoing cardiac surgery receiving colchicine vs. placebo.

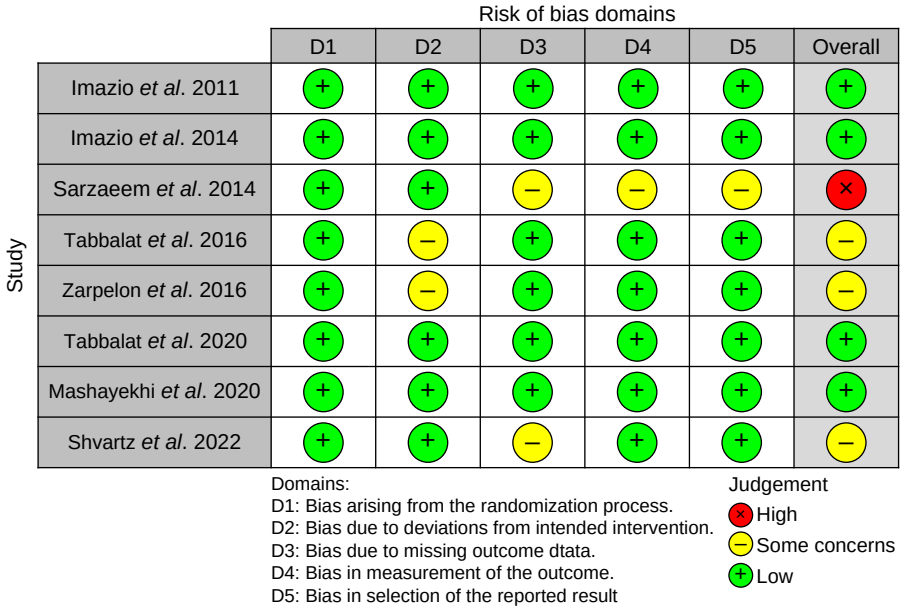


Figure 5 Risk of bias assessment.

and we did not have access to patient-level data. Therefore, our findings should only be considered hypothesis-generating. Second, the definition of POAF differed among various included studies, potentially leading to misclassification bias. Third, due to the inconsistent dosing regimens in the included studies, we could not compare the effectiveness of different dosages of colchicine, which might impact its efficacy, tolerability, and safety. Another potential limitation was the underdetection of POAF because a large proportion of patients with AF can be asymptomatic and may not have had continuous monitoring.

Conclusion

This meta-analysis of eight RCTs shows that compared to a placebo, colchicine is effective at preventing POAF in patients undergoing cardiac surgery with a higher rate of adverse gastrointestinal events and similar rates of drug discontinuation. Further prospective adequately powered studies are required to define the optimal duration and dose of colchicine to prevent POAF.

Supplementary material

Supplementary material is available at *Europace* online.

Authors' Contributions

1. Conceptualization: S.A., C.B., and Z.U.A.
2. Data curation: S.A., J.K., M.F.A., A.G., and K.F.
3. Formal analysis: S.A., M.B.M., and Z.U.A.
4. Investigation: C.V.S, A.D., S.S., W.J., and S.P.
5. Methodology: S.A. and Z.U.A
6. Project administration: S.C. and Z.U.A.
7. Validation, Visualization: J.K. and Z.U.A
8. Writing—original draft: S.A. and C.B.
9. Writing—review & editing: Z.U.A., A.D., S.S., W.J., and S.P.

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Data availability

The authors confirm that the data supporting the findings of this study are available within the article or its supplementary materials.

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