Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Effect of Low Dose Colchicine on Long term Recurrence After Atrial Fibrillation Ablation

Mohammed Al-Sadawi[1], Faisal Aslam[1], Matthew D. Henriques[1], Mahmoud Alsaiqali[2], Chad Gier[1], Paul Kim[1], Ibrahim Almasry[1], Abhijeet Singh[1], Roger Fan[1], and Eric Rashba[1]

[1]Stony Brook University Hospital
[2]SUNY Downstate Health Sciences University Department of Medicine

June 28, 2023

Abstract

Background: Colchicine is commonly used early after atrial fibrillation (AF) ablation to reduce inflammation and reduce AF recurrence, but there is limited long-term efficacy data. **Objective:** To evaluate the effect of low dose colchicine use on long-term AF recurrence after AF ablation. **Methods:** From 2013 to 2021, all AF ablations performed at a single tertiary care medical center were analyzed for colchicine use, clinical and procedural characteristics, and AF recurrence. The colchicine dose was 0.3-0.6 mg once daily for 30 days. The primary outcome was AF recurrence, defined as AF detection for more than 30 seconds after a three-month blanking period. Propensity score matching (PSM, 1:1 match) was performed using covariates that were significant predictors of AF recurrence in prior studies. The minimum duration of follow-up was 6 months. Kaplan-Meier analysis was conducted to assess time to AF recurrence in the entire cohort and the PSM cohort. **Results:** The study population consisted of 1568 AF ablations in 1412 patients (67% male, age 65 ± 7 years and mean follow up 34 ± 14 months); 78% of the patients received colchicine. Colchicine use was associated with decreased AF recurrence (HR 0.78, CI 0.63-0.96, p=0.022). After PSM there were 275 patients in each group. AF recurrence was lower with colchicine (HR 0.71, CI 0.53-0.96, p=0.026). **Conclusions:** Low dose colchicine use was associated with lower long-term AF recurrence after AF ablation. A randomized, placebo-controlled trial is warranted to confirm if low dose colchicine should be used routinely after AF ablation.

Effect of Low Dose Colchicine on Long term Recurrence After Atrial Fibrillation Ablation

Authors:

Mohammed Al-Sadawi, MD[1], Faisal Aslam, MD[1], Matthew D. Henriques, MD[1], Mahmoud Alsaiqali, MD[2], Chad Gier, MD[1], Paul Kim, MD[1], Ibrahim Almasry, MD[1], Abhijeet Singh, MD[1], Roger Fan, MD[1], Eric Rashba, MD[1], FHRS

Author Affiliations:

[1]Stony Brook Heart Institute, Stony Brook University Hospital, Stony Brook, NY

[2]Department of Medicine, SUNY Downstate University Hospital, Brooklyn, NY

Corresponding Author:

Eric Rashba, MD, MHCM, FHRS

Director, Stony Brook Heart Rhythm Center

Stony Brook Medicine

101 Nicolls Rd, Stony Brook, NY 11794, USA

Tel: +1 (631) 444-3575

Email: Eric.Rashba@stonybrookmedicine.edu

Short Title: Colchicine Effect on Recurrence of AF after Catheter Ablation

Word Count: 1956

Key Words: colchicine, AF, recurrence, catheter ablation, PVI

Financial Disclosures: None

Conflicts of Interest: None

GUIDELINES STATEMENT: The research reported in this paper adhered to Helsinki Declaration guidelines and approved by Stony Brook Medicine Institutional Review Board.

ABBREVIATIONS

AF: atrial fibrillation

AT: atrial tachycardia

AVNRT: atrioventricular nodal reentrant tachycardia

BMI: body mass index

CTI: cavotricuspid isthmus

DM: diabetes mellitus

HTN: hypertension

LA: left atrium

PV: pulmonary vein(s)

PVI: pulmonary vein isolation

PVR: pulmonary vein reconnection

RFA: radio-frequency ablation

SVC: superior vena cava

Abstract

Background: Colchicine is commonly used early after atrial fibrillation (AF) ablation to reduce inflammation and reduce AF recurrence, but there is limited long-term efficacy data.

Objective: To evaluate the effect of low dose colchicine use on long-term AF recurrence after AF ablation.

Methods: From 2013 to 2021, all AF ablations performed at a single tertiary care medical center were analyzed for colchicine use, clinical and procedural characteristics, and AF recurrence. The colchicine dose was 0.3-0.6 mg once daily for 30 days. The primary outcome was AF recurrence, defined as AF detection for more than 30 seconds after a three-month blanking period. Propensity score matching (PSM, 1:1 match) was performed using covariates that were significant predictors of AF recurrence in prior studies. The minimum duration of follow-up was 6 months. Kaplan-Meier analysis was conducted to assess time to AF recurrence in the entire cohort and the PSM cohort.

Results: The study population consisted of 1568 AF ablations in 1412 patients (67% male, age 65 ± 7 years and mean follow up 34 ± 14 months); 78% of the patients received colchicine. Colchicine use was associated with decreased AF recurrence (HR 0.78, CI 0.63-0.96, p=0.022). After PSM there were 275 patients in each group. AF recurrence was lower with colchicine (HR 0.71, CI 0.53-0.96, p=0.026).

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Conclusions: Low dose colchicine use was associated with lower long-term AF recurrence after AF ablation. A randomized, placebo-controlled trial is warranted to confirm if low dose colchicine should be used routinely after AF ablation.

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Introduction

Atrial fibrillation (AF) is the most common sustained arrhythmia, diagnosed in 2-3% of patients worldwide[1]. AF contributes to an extensive degree of morbidity and mortality that is responsible for significant utilization of healthcare resources[1]. Radiofrequency ablation has been established as a safe and effective therapy for AF. In recent years, trials such as EAST-AFNET 4 have established the benefit of early rhythm control for decreasing cardiovascular death, stroke, and hospitalizations[2]. As a result, catheter ablation (CA) has moved to the forefront of AF treatment as an effective means of maintaining rhythm control and reducing AF recurrence.

The lesions applied during CA produce localized necrosis and resulting electrical isolation but can also trigger an inflammatory response that has been postulated to play a role in recurrence of AF[4]. Colchicine is an oral medication that acts primarily by inhibiting microtubule polymerization in neutrophils, disrupting their migration to inflammatory foci[5]. Colchicine also suppresses the activation of the NLRP3 (NACHT, LRR, and PYD domain containing protein 3) inflammasome, reducing the expression of various interleukins[5]. Consequently, the use of colchicine has been explored extensively as an anti-inflammatory therapeutic and has proven effective for the treatment of acute, recurrent, and post-pericardiotomy pericarditis in the COPE, CORE, and COPPS trials[6].

Several smaller studies have investigated the efficacy of standard dose colchicine for the prevention of post-ablation AF recurrence, with conflicting results and high rates of medication side effects[13]. There are no formal society recommendations regarding the use of colchicine after CA for AF[14-16]. In this study, we report our single center experience with low dose colchicine for the prevention of long-term AF recurrence after AF ablation.

Methods

Study Population:

All consecutive patients who underwent AF ablation at Stony Brook University Hospital between January 2013 and July 2021 were included. During the study period, 1568 AF ablations in 1412 patients were performed; 535 (33%) were female. Data for AF recurrence, procedure complications, and emergency department visits/in-patient hospitalizations was collected by chart review. The Stony Brook Medicine Institutional Review Board reviewed and approved this study. The patient consent requirement was waived because of the retrospective observational chart review study design. We included CA using either radiofrequency ablation or cryoablation.

Procedure Characteristics:

Patients underwent pre-ablation contrast enhanced computed tomography or transesophageal echocardiography to rule out left atrial appendage clot. Oral anticoagulation was held on the morning of the procedure. General anesthesia with high frequency jet ventilation was used for radiofrequency ablation cases to enhance catheter stability; if this was not tolerated, the patient received conventional ventilation. Electroanatomical mapping was performed for all cases. All patients underwent pulmonary vein isolation. Additional focal or linear lesions were placed at the operator's discretion if atrial tachyarrhythmias or AF remained inducible. Adenosine was used to assess for dormant PV conduction and isoproterenol to detect AF triggers according to physician preference. The patients were discharged on anti-arrhythmic medication, pantoprazole, and/or low dose colchicine according to physician preference, for a duration of 1 month. The colchicine dose was 0.6mg once daily, with dose reduction to 0.3mg once daily for patients treated with amiodarone or dronedarone [17].

Patients Characteristics and Follow up:

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Data was collected by reviewing clinical notes, hospital admissions, clinic visits, ablation procedure details, phone calls, and emergency department/hospital visits. Baseline characteristics, comorbidities, medications, and echocardiographic parameters were determined through chart review. Follow ups were obtained for at least 6 months with mean of 34 months.Long-term AF recurrence (> 30 seconds) after a 3-month blanking period was documented clinically by ECGs during emergency department visits, clinic visits, and hospital admissions, or by cardiac monitoring devices including pacemakers, loop recorders, Mobile Cardiac Telemetry and Holter monitors. Clinic visits were usually scheduled at 1, 3, 6 and 12 months post procedure and in-office or remote device follow-up every 1-3 months.

Statistical Analysis:

The chi square test was used to compare categorical baseline characteristics, and unpaired t-tests for continuous data. Cox proportional hazards analysis was used to assess the effects of colchicine on AF recurrence. Logistic regression was used to evaluate the effects of different procedural approaches and predictors of outcomes. A P value of <0.05 was considered statistically significant. Propensity score matching (PSM) was performed for clinical predictors that have been previously reported to influence AF ablation outcomes (sex, age, body mass index (BMI), atrial fibrillation type (paroxysmal/persistent), hypertension, obstructive sleep apnea, and diabetes).[8,9,10] Logistic regression was used to estimate the propensity score. Matching was 1:1 nearest neighbor matching without replacement. Balance in the matched sets was examined using visual inspection and change in the mean and absolute standardized mean difference. After matching, all standardized mean differences for the covariates were below 0.1 indicating adequate balance. To estimate the treatment effect and its standard error, we fit a cox proportional regression model with AF recurrence as the outcome and colchicine as the treatment, and covariates and included the matching weights in the estimation. We used Package "matchit" to perform propensity score matching. All analyses were performed using R Statistical Software (R version 4.2.1, GNU project).

Results

Patient Population:

A total of 1568 AF ablations were performed in 1412 patients. The study cohort had a mean age of 64±7 years, 33% female, BMI 31±6.5 kg/m^2 and was 93% Caucasian. Paroxysmal AF was present in 73% of patients and 77% underwent de novo ablations. Radiofrequency ablation was performed in 1357 cases and cryoablation in 219.

Patient characteristics and procedure details:

Colchicine was used after AF ablation in 1228 cases (78%). Patients who were prescribed colchicine were older (67 vs 63 years; p <0.001), had a higher incidence of hypertension (60% vs 54%, p=0.033), and had a lower incidence of paroxysmal AF (70 vs. 82 %; p <0.001, Table 1). There was no significant difference in left atrial diameter between the two groups (4.30 vs. 3.85 cm, p value = 0.2).

Outcomes:

Colchicine was associated with a significant reduction in AF recurrence (HR 0.78, 95% CI [0.63, 0.96], P 0.022) (Figure 1). Mean time to AF recurrence in days were 468±120 days in the colchicine group vs 282±112 days in the no colchicine group.

Patients with persistent AF (HR 1.56, 95% CI [1.27, 1.91], p<0.001) and those undergoing repeat ablation (HR 1.37, CI [1.12, 1.67], p=0.002) were more likely to have AF recurrence. More extensive ablation was performed in the colchicine group (OR 3.69, 95% CI [2.84, 4.81], p<0.001). Patients with persistent AF (OR 1.95, 95% CI [1.47, 2.59], p<0.001) and older patients (OR 1.02, 95% CI [1.01, 1.04], p<0.001) required more extensive ablation.

Patient characteristics and procedure details in the PSM cohort:

After PSM there were 275 patients in each group. Covariates were well balanced between the two groups.

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Characteristics of the two groups are presented in Table 2. Mean age was 64 years and mean BMI 30. 85% of the patients had paroxysmal AF. After propensity matching for risk factors, the colchicine group had more additional ablations other than PVI (OR 3.67, 95% CI [2.55, 5.32], P<0.001).

Outcomes in the PSM cohort:

Colchicine was associated with a significant reduced risk of AF recurrence (HR 0.71, 95% CI [0.53, 0.96], p=0.026) (Figure 2). Mean time to AF recurrence in days were 550 days (247, 1,174) in colchicine group vs 331 days (200, 674) in no colchicine group. Colchicine use was associated with decreased AF recurrence in patients with paroxysmal AF (HR 0.70, CI 0.50-0.98, p=0.036) but not persistent AF (HR 0.79, CI 0.39-1.59, p=0.5).

Discussion

The major findings of this study are that low dose colchicine was associated with a significant reduction in AF recurrence after AF ablation. There was a 22% reduction in AF recurrence in the entire cohort and a 29% reduction in the PSM subgroup. Our results suggest that low dose colchicine may be useful to reduce long-term AF recurrence after AF ablation.

Catheter ablation has been validated as the most effective therapy for atrial fibrillation. The 12-month and 62-month success rate for pulmonary vein isolation for paroxysmal AF has been demonstrated to be as high as 78% and 59%, respectively [5]. Adjunctive approaches to achieve more durable AF ablation efficacy continue to be explored. *Deftereos et al* reported that 0.5mg colchicine twice daily for 3 months was associated with a significant reduction in AF recurrence at 12 months after *de novo* ablation in paroxysmal AF patients (31.1% vs. 49.5%).[9] However, there were frequent reported side effects with a treatment discontinuation rate of 10.8%. *Agarwal et al* reported that 0.6mg colchicine twice daily was associated with reduction of AF recurrence at 12 months[19]. In the Post Ablation Pericarditis Reduction Study (*PAPERS*) trial [20], patients were randomized on the day of the procedure to receive 0.6 mg of colchicine twice daily for 7 days. Significant side effects were reported in the treatment group (47%) with no difference in pericarditis rates. All of these studies used higher doses of colchicine than we employed in the present study. To our knowledge, our study is the first to report the effect of short term (1 month), low dose (0.6 mg daily) colchicine use on long-term AF recurrence after AF ablation. We hypothesize that the efficacy of the low dose, short-term colchicine regimen that we used is attributable to less treatment discontinuation, although this could not be tested due to inconsistent reporting in the medical record. Short term colchicine administration may improve compliance without compromising efficacy, as AF incidence was reduced to a similar extent after cardiac surgery with 1 month and 3 month treatment durations.[22] It is notable that colchicine was associated with a long-term reduction in AF recurrence despite a higher incidence of persistent AF and more extensive substrate ablation in the colchicine group, which would be expected to increase AF recurrence.

Colchicine has historically been used to treat gout and other inflammatory conditions including pericarditis [1]. Colchicine inhibits the assembly and activation of the NLRP3 inflammasome as well as the release of neutrophil enzymes that activate inflammatory interleukins 1ß and 18 [5, 18]. The NLRP3 inflammasome has cardiac specific effects, and plays a role in the secretion of cytokines while also promoting ectopic firing and adverse atrial remodeling [5]. In the immediate-term, reducing neutrophil activation by microtubule inhibition may attenuate inflammatory responses that could precipitate arrhythmogenesis[5]. The NLRP3 inflammasome has been found to promote upregulation of RYR2 receptors and subsequent Ca^{2+} release from the sarcoplasmic reticulum[21], which promotes ectopic firing through delayed afterdepolarizations. Additionally, through Caspase1-mediated pyroptosis, an inflammatory cascade ultimately leads to recruitment of inflammatory mediators that promote formation of fibrosis and the atrial substrate that ultimately facilitates AF[5]. Furthermore, colchicine reduces serum inflammatory biomarkers after ablation, including C-reactive protein (CRP) and interleukin-6 (IL-6)[9, 10].

It is unclear how short-term colchicine use prevents long-term AF recurrence. Colchicine reduces early AF recurrence and pericarditis, which could decrease the risk of long-term AF recurrence.[13] However, amiodarone reduced early, but not long-term AF recurrence.[23] Colchicine has been associated with reduced myocardial

fibrosis in animal studies, which could influence long-term AF recurrence.[24]

Limitations

This study was performed at a single academic medical center, which may limit its generalizability. Colchicine was used according to physician preference, so unrecognized confounders may be present even after PSM matching. Data were ascertained by retrospective chart review, which may affect the completeness and accuracy of the data. We could not assess medication side effects or discontinuation rates due to inconsistent reporting of these data. Variable methods were used to detect AF recurrence, which could introduce detection bias for the primary outcome. There was limited statistical power to analyze subgroups, so the differential results in paroxysmal and persistent AF patients should be viewed as hypothesis generating.

Conclusion

Low dose colchicine use was associated with a significant reduction in AF recurrence after AF ablation. A randomized, placebo-controlled trial is warranted to determine if low dose colchicine should be used routinely after AF ablation.

Table1: Patient demographics and procedural details

No Colchicine

(N=347)

Colchicine

(N=1228)

P-value

Sex (male)

234 (69%)

799 (65%)

0.2

Age (years, mean +/-SD)

63+/- 7

67+/- 8

<0.001

BMI (kg/m^2, mean +/-SD)

31+/- 4

30+/- 3

0.091

Type of AF

<0.001

Paroxysmal

274 (82%)

851 (70%)

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Persistent

60 (18%)

371 (30%)

Left Atrium Diameter (cm, mean +/-SD)

3.85 +/- 0.6

4.30 +/-0.5

0.2

Coronary Artery Disease (%)

63 (18%)

259 (21%)

0.2

Diabetes Mellitus (%)

58 (17%)

201 (16%)

0.9

Hypertension (%)

187 (54%)

740 (60%)

0.033

Obstructive Sleep Apnea (%)

66 (19%)

225 (18%)

0.8

Pre-procedure antiarrhythmic use

198 (61%)

882 (72%)

<0.001

Procedural Details

CTI dependent Atrial Flutter

64 (18%)

248 (20%)

0.5

Additional Ablations Performed

145 (45%)

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

928 (76%)

<0.001

Extra Vein Triggers Noted

13 (4.0%)

149 (12%)

<0.001

Adenosine Used to Check for Dormant Conduction

215 (67%)

779 (63%)

0.2

Post-procedure Amiodarone use

111 (32%)

708 (58%)

<0.001

Post-procedure Dronederone use

20 (5.8%)

105 (8.6%)

0.090

Table 2. Predictors of AF recurrence in entire cohort

	HR	**95% CI**	**P value**
Female	1.16	0.95, 1.42	0.14
Age	1.01	1.00, 1.02	0.1
BMI	1.01	1.00, 1.03	0.14
Persistent AF	1.56	1.27, 1.91	0.001
Redo ablation	1.37	1.12, 1.67	0.002
Hypertension	0.81	0.66, 0.99	0.036
Diabetes mellitus	0.87	0.66, 1.15	0.3

Table 3: Demographics and procedural details in the PSM cohort

	No Colchicine N = 275	**Colchicine** N = 275	**P-value**
Sex (male)	191 (69%)	185 (67%)	0.6
Age (years, mean +/-SD)	63 +/- 6	65 +/- 7	0.14
BMI (kg/m^2, mean +/-SD)	31 +/- 4	30 +/- 4	0.5
Type of AF			0.7
Paroxysmal	235 (85%)	232 (84%)	
Persistent	40 (15%)	43 (16%)	

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

	No Colchicine N = 275	**Colchicine** N = 275	**P-value**
Coronary Artery Disease (%)	51 (19%)	52 (19%)	>0.9
Diabetes Mellitus (%)	49 (18%)	44 (16%)	0.6
Hypertension (%)	155 (56%)	162 (59%)	0.5
Obstructive Sleep Apnea (%)	55 (20%)	53 (19%)	0.8
Pre-procedure antiarrhythmic use	165 (61%)	200 (73%)	0.003
Procedural Details			
CTI dependent Atrial Flutter	54 (20%)	63 (23%)	0.3
Additional Ablations Performed	120 (44%)	202 (73%)	<0.001
Adenosine Used to Check for Dormant Conduction	188 (69%)	167 (61%)	0.053
Post-procedure Amiodarone use	89 (32%)	152 (55%)	<0.001
Post-procedure Dronederone use	18 (6.5%)	25 (9.1%)	0.3

Figure 1: Effect of colchicine on AF recurrence in the entire cohort HR 0.78, CI (0.63-0.96); p=0.02

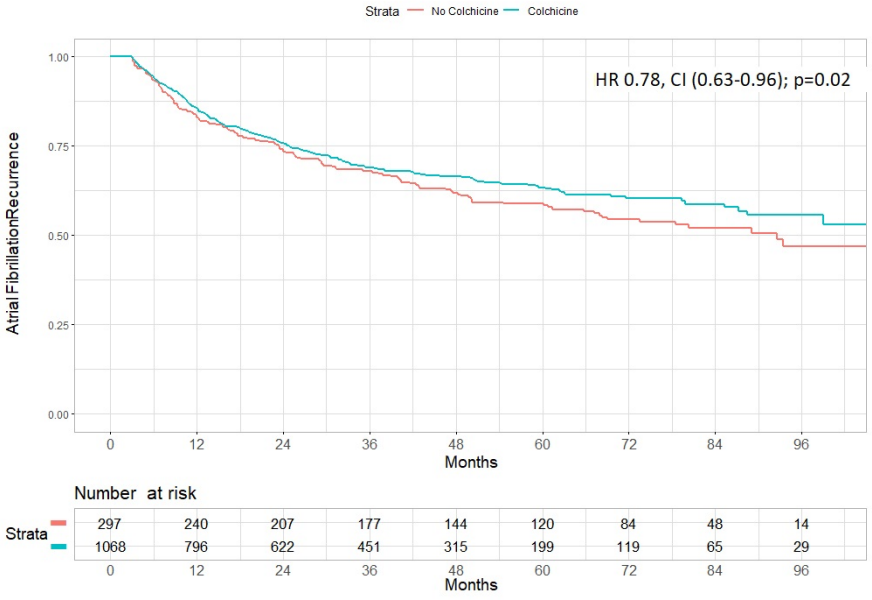
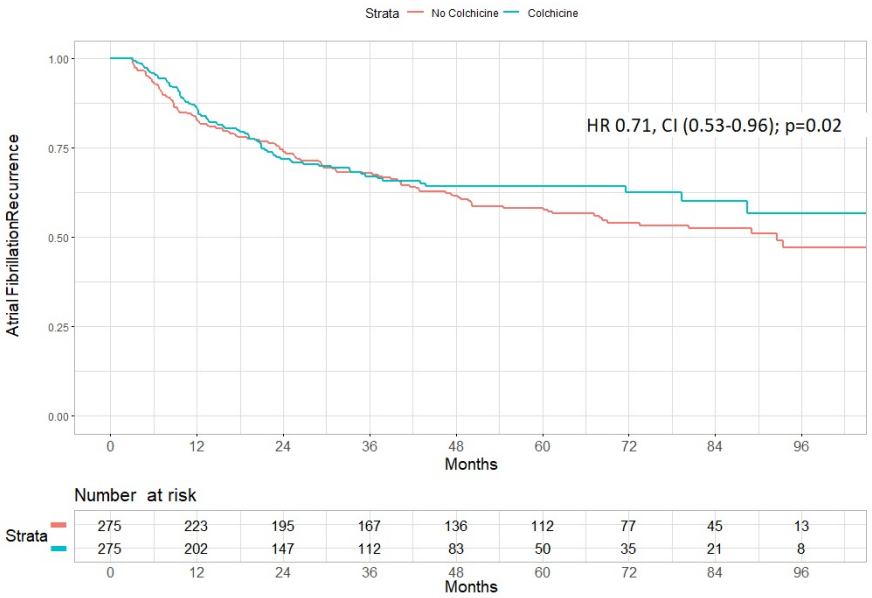


Figure 2: Effect of colchicine on AF recurrence in the PSM cohort; HR 0.71, CI (0.53-0.96); p=0.02

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.



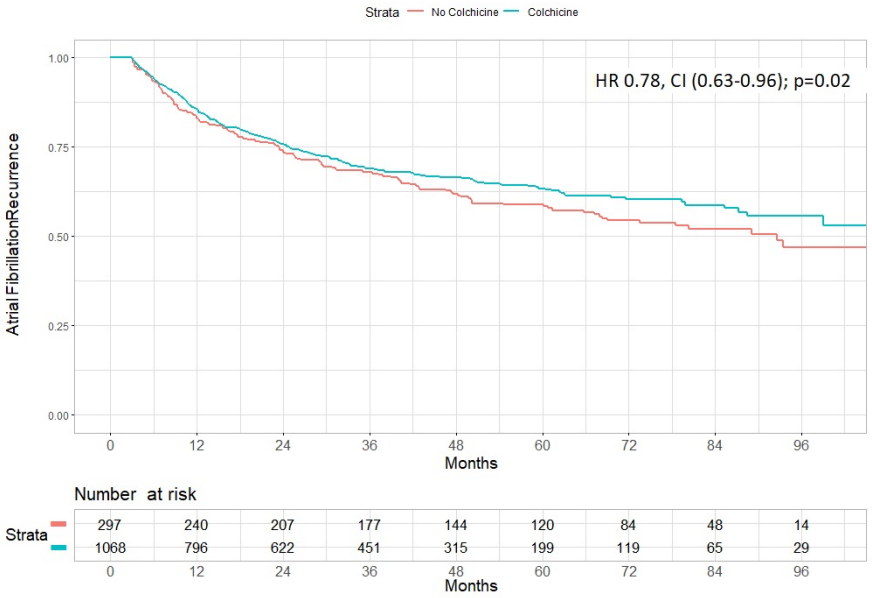
References

1. Varghese B, Feldman DI, Chew C, Valilis E, Blumenthal RS, Sharma G, Calkins H. Inflammation, atrial fibrillation, and the potential role for colchicine therapy. *Heart Rhythm O2.* 2021;2:298–303.
2. Kirchhof P, Camm AJ, Goette A, Brandes A, Eckardt L, Elvan A, Fetsch T, van Gelder IC, Haase D, Haegeli LM, Hamann F, Heidbüchel H, Hindricks G, Kautzner J, Kuck KH, Mont L, Ng GA, Rekosz J, Schoen N, Schotten U, Suling A, Taggeselle J, Themistoclakis S, Vettorazzi E, Vardas P, Wegscheider K, Willems S, Crijns HJGM, Breithardt G; EAST-AFNET 4 Trial Investigators. Early Rhythm-Control Therapy in Patients with Atrial Fibrillation. N Engl J Med. 2020 Oct 1;383(14):1305-1316.
3. Kis Z, Muka T, Franco OH, Bramer WM, De Vries LJ, Kardos A, Szili-Torok T. The Short and Long-Term Efficacy of Pulmonary Vein Isolation as a Sole Treatment Strategy for Paroxysmal Atrial Fibrillation: A Systematic Review and Meta-Analysis. Curr Cardiol Rev. 2017;13(3):199-208.
4. Koyama T, Sekiguchi Y, Tada H, Arimoto T, Yamasaki H, Kuroki K, Machino T, Tajiri K, Zhu XD, Kanemoto M, Sugiyasu A, Kuga K, Aonuma K. Comparison of characteristics and significance of immediate versus early versus no recurrence of atrial fibrillation after catheter ablation. Am J Cardiol. 2009 May 1;103(9):1249-54.
5. Yao C, Veleva T, Scott L Jr, Cao S, Li L, Chen G, Jeyabal P, Pan X, Alsina KM, Abu-Taha I Dr, Ghezelbash S, Reynolds CL, Shen YH, LeMaire SA, Schmitz W, Müller FU, El-Armouche A, Tony Eissa N, Beeton C, Nattel S, Wehrens XHT, Dobrev D, Li N. Enhanced Cardiomyocyte NLRP3 Inflammasome Signaling Promotes Atrial Fibrillation. Circulation. 2018 Nov 13;138(20):2227-2242. 0.1161/CIRCULATIONAHA.118.035202. Erratum in: Circulation. 2019 Apr 23;139(17):e889.
6. Deftereos SG, Beerkens FJ, Shah B, Giannopoulos G, Vrachatis DA, Giotaki SG, Siasos G, Nicolas J, Arnott C, Patel S, Parsons M, Tardif JC, Kovacic JC, Dangas GD. Colchicine in Cardiovascular Disease: In-Depth Review. Circulation. 2022 Jan 4;145(1):61-78.
7. Agarwal S, Munir MB, Asad ZUA. Safety and efficacy of colchicine for the prevention of recurrent atrial fibrillation post-catheter ablation: Colchicine for Recurrent AF Post-PVI. Eur J Intern Med. 2023 May;111:143-145.
8. Deftereos S, Giannopoulos G, Kossyvakis C, Efremidis M, Panagopoulou V, Kaoukis A, Raisakis K, Bouras G, Angelidis C, Theodorakis A, Driva M, Doudoumis K, Pyrgakis V, Stefanadis C. Colchicine for prevention of early atrial fibrillation recurrence after pulmonary vein isolation: a randomized controlled study. J Am Coll Cardiol. 2012 Oct 30;60(18):1790-6.

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

9. Deftereos S, Giannopoulos G, Efremidis M, Kossyvakis C, Katsivas A, Panagopoulou V, Papadimitriou C, Karageorgiou S, Doudoumis K, Raisakis K, Kaoukis A, Alexopoulos D, Manolis AS, Stefanadis C, Cleman MW. Colchicine for prevention of atrial fibrillation recurrence after pulmonary vein isolation: mid-term efficacy and effect on quality of life. Heart Rhythm. 2014 Apr;11(4):620-8.
10. Deftereos SG, Vrachatis DA, Angelidis C, Vrettou AR, Sarri EK, Giotaki SG, Varytimiadi E, Kossyvakis C, Kotsia E, Deftereos GS, Doudoumis K, Giannopoulos G. The Role of Colchicine in Treating Postoperative and Post-catheter Ablation Atrial Fibrillation. Clin Ther. 2019 Jan;41(1):21-29.
11. Papageorgiou N, Briasoulis A, Lazaros G, Imazio M, Tousoulis D. Colchicine for prevention and treatment of cardiac diseases: A meta-analysis. Cardiovasc Ther. 2017 Feb;35(1):10-18.
12. Kommu S, Arepally S. The Effect of Colchicine on Atrial Fibrillation: A Systematic Review and Meta-Analysis. Cureus. 2023 Feb 17;15(2):e35120.
13. Mohanty S, Mohanty P, Kessler D, Gianni C, Baho KK, Morris T, Yildiz T, Quintero Mayedo A, MacDonald B, Della Rocca DG, Al-Ahmad A, Bassiouny M, Gallinghouse GJ, Horton R, Burkhardt JD, di Biase L, Natale A. Impact of Colchicine Monotherapy on the Risk of Acute Pericarditis Following Atrial Fibrillation Ablation. JACC Clin Electrophysiol. 2023 Apr 17:S2405-500X(23)00118-4.
14. Adler Y, Charron P, Imazio M, Badano L, Barón-Esquivias G, Bogaert J, Brucato A, Gueret P, Klingel K, Lionis C, Maisch B, Mayosi B, Pavie A, Ristic AD, Sabaté Tenas M, Seferovic P, Swedberg K, Tomkowski W; ESC Scientific Document Group. 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC)Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2015 Nov 7;36(42):2921-2964.
15. Craig T. January, L. Samuel Wann, Joseph S. Alpert, Hugh Calkins, Joaquin E. Cigarroa, Joseph C. Cleveland, Jamie B. Conti, Patrick T. Ellinor, Michael D. Ezekowitz, Michael E. Field, Katherine T. Murray, Ralph L. Sacco, William G. Stevenson, Patrick J. Tchou, Cynthia M. Tracy, Clyde W. Yancy, 2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society, Journal of the American College of Cardiology, Volume 64, Issue 21, 2014, Pages e1-e76, ISSN 0735-1097
16. Calkins H, Hindricks G, Cappato R, Kim YH, Saad EB, Aguinaga L, Akar JG, Badhwar V, Brugada J, Camm J, Chen PS, Chen SA, Chung MK, Cosedis Nielsen J, Curtis AB, Davies DW, Day JD, d'Avila A, Natasja de Groot NMS, Di Biase L, Duytschaever M, Edgerton JR, Ellenbogen KA, Ellinor PT, Ernst S, Fenelon G, Gerstenfeld EP, Haines DE, Haissaguerre M, Helm RH, Hylek E, Jackman WM, Jalife J, Kalman JM, Kautzner J, Kottkamp H, Kuck KH, Kumagai K, Lee R, Lewalter T, Lindsay BD, Macle L, Mansour M, Marchlinski FE, Michaud GF, Nakagawa H, Natale A, Nattel S, Okumura K, Packer D, Pokushalov E, Reynolds MR, Sanders P, Scanavacca M, Schilling R, Tondo C, Tsao HM, Verma A, Wilber DJ, Yamane T; Document Reviewers:. 2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation. Europace. 2018 Jan 1;20(1):e1-e160.
17. Colchicine - Drug Summary. (2023) https://www.pdr.net/drug-summary/Colcrys-colchicine-592
18. Wu Q, Liu H, Liao J, Zhao N, Tse G, Han B, Chen L, Huang Z, Du Y. Colchicine prevents atrial fibrillation promotion by inhibiting IL-1β-induced IL-6 release and atrial fibrosis in the rat sterile pericarditis model. Biomed Pharmacother. 2020 Sep;129:110384.
19. Mohanty S, Mohanty P, Kessler D, Gianni C, Baho KK, Morris T, Yildiz T, Quintero Mayedo A, MacDonald B, Della Rocca DG, Al-Ahmad A, Bassiouny M, Gallinghouse GJ, Horton R, Burkhardt JD, di Biase L, Natale A. Impact of Colchicine Monotherapy on the Risk of Acute Pericarditis Following Atrial Fibrillation Ablation. JACC Clin Electrophysiol. 2023 Apr 17:S2405-500X(23)00118-4.
20. Ahmed AS, Miller J, Foreman J, Golden K, Shah A, Field J, Gilge J, Clark B, Joshi S, Nair G, Olson J, Padanilam BJ, Prystowsky E, Patel PJ. Prophylactic Colchicine After Radiofrequency Ablation of Atrial Fibrillation: Post Ablation Pericarditis Reduction Study (PAPERS). JACC Clin Electrophysiol. 2023 Mar 20:S2405-500X(23)00092-0.
21. Lu YY, Chen YC, Kao YH, Lin YK, Yeh YH, Chen SA, Chen YJ. Colchicine modulates calcium

homeostasis and electrical property of HL-1 cells. J Cell Mol Med. 2016 Jun;20(6):1182-90. doi: 10.1111/jcmm.12818. Epub 2016 Feb 29.
22. Zhao H, Chen Y, Mao M, Yang J, Chang J. A meta-analysis of colchicine in prevention of atrial fibrillation following cardiothoracic surgery or cardiac intervention. J Cardiothorac Surg. 2022 Sep 1;17(1):224. doi: 10.1186/s13019-022-01958-9. Erratum in: J Cardiothorac Surg. 2022 Nov 11;17(1):285.
23. Darkner S, Chen X, Hansen J, Pehrson S, Johannessen A, Nielsen JB, Svendsen JH. Recurrence of arrhythmia following short-term oral AMIOdarone after CATheter ablation for atrial fibrillation: a double-blind, randomized, placebo-controlled study (AMIO-CAT trial). Eur Heart J. 2014 Dec 14;35(47):3356-64.
24. Yue H, Liang W, Zhan Y, Zhang Z, Qin X, Bian L, He K, Wu Z. Colchicine: Emerging therapeutic effects on atrial fibrillation by alleviating myocardial fibrosis in a rat model. Biomed Pharmacother. 2022 Oct;154:113573.



Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.

Posted on 28 Jun 2023 — The copyright holder is the author/funder. All rights reserved. No reuse without permission. — https://doi.org/10.22541/au.168792314.40742190/v1 — This a preprint and has not been peer reviewed. Data may be preliminary.