

Corticosteroids prevented atrial fibrillation after cardiac surgery

Halonen J, Halonen P, Järvinen O, et al. Corticosteroids for the prevention of atrial fibrillation after cardiac surgery: a randomized controlled trial. *JAMA*. 2007;297:1562-7.

Clinical impact ratings: Cardiology ★★★★★☆☆

QUESTION

In patients having cardiac surgery, do postoperative corticosteroids prevent atrial fibrillation?

METHODS

Design: Randomized placebo-controlled trial.

Allocation: Concealed.*

Blinding: Blinded (clinicians, patients, and outcome assessors).*

Follow-up period: 84 hours after surgery, with additional follow-up for 6 months to assess complications.

Setting: 3 university hospitals in Finland.

Patients: 242 patients 30 to 85 years of age (mean age 65 y, 76% men) having their first on-pump coronary artery bypass graft and/or aortic valve replacement surgery. Exclusion criteria included history of atrial fibrillation or flutter, uncontrolled diabetes, systemic infection, active tuberculosis, Cushing syndrome, psychotic disorder, herpes simplex keratitis, and renal insufficiency.

Intervention: Intravenous hydrocortisone sodium succinate, 100 mg in 100 mL normal saline every 8 h for 3 d starting the evening of the surgery ($n = 120$), or placebo

($n = 121$). All patients also received oral metoprolol titrated to heart rate. Patients received continuous electrocardiographic monitoring.

Outcomes: Atrial fibrillation (lasting > 5 min) during the first 84 hours after surgery, in-hospital atrial fibrillation, postoperative complications.

Patient follow-up: 100% (intention-to-treat analysis).

MAIN RESULTS

Hydrocortisone reduced risk for atrial fibrillation more than placebo in the first 84 hours after surgery and during hospital stay (Table). 1 patient died in each group. Groups did not differ for postoperative infection, mediastinitis, stroke, myocardial infarction, conduction disturbances, or re sternotomy caused by bleeding.

In a meta-analysis of 3 randomized trials ($n = 621$) of corticosteroids to prevent atrial fibrillation after cardiac surgery (including the present trial), the pooled risk ratio was 0.67 (95% CI 0.54 to 0.85), with no evidence of heterogeneity.

CONCLUSION

In patients having cardiac surgery, postoperative corticosteroids reduced risk for atrial fibrillation.

Source of funding: Kuopio University EVO Foundation.

For correspondence: Dr. J. Halonen, Kuopio University Hospital, Kuopio, Finland. E-mail: jari.halonen@kuh.fi. ■

*See Glossary.

Hydrocortisone vs placebo to prevent atrial fibrillation after cardiac surgery†

Outcomes	Hydrocortisone	Placebo	RRR (95% CI)	NNT (CI)
Atrial fibrillation in first 84 h	30%	48%	37% (13 to 55)	6 (4 to 18)
Atrial fibrillation in hospital	37%	52%	28% (5 to 47)	7 (4 to 49)

†Abbreviations defined in Glossary. RRR, NNT, and CI calculated from data in article.

COMMENTARY

Increasing evidence exists that inflammation is associated with a higher risk for atrial fibrillation. The well-designed trial by Halonen and colleagues found that 3 days of intravenous hydrocortisone, started the evening after cardiac surgery, was associated with a reduced incidence of postoperative atrial fibrillation from 48% to 30%. This interesting finding suggests a cause-and-effect relation between inflammation and postoperative atrial fibrillation. However, it is unlikely that this trial will lead to widespread acceptance of the intervention for at least 3 reasons.

First, surgeons widely believe (based on evidence from long-term use of corticosteroids [1]) that perioperative corticosteroids are associated with postoperative infections and poor wound healing. The authors acknowledged that the trial was not powered to detect a difference in surgical outcomes. Therefore, a much larger trial would be needed to demonstrate perioperative safety of short-term corticosteroids.

Second, the study has low generalizability. Of the 650 patients screened, 404 were excluded. Although the exclusion criteria were listed, it is not clear how many patients were excluded for each reason. However, the exclusion criteria included many medical conditions that

are common in surgical patients, such as peptic ulcer disease and renal insufficiency.

Finally, the authors did not evaluate whether corticosteroid treatment reduced length of hospital stay or hospital costs. Although many interventions have been shown to reduce the incidence of postoperative atrial fibrillation, only a few have resulted in a reduction in the number of days in hospital (2); these provide a standard for other interventions for this purpose.

Bradley P. Knight, MD
University of Chicago Medical Center
Chicago, Illinois, USA

References

- Ehrlichman RJ, Seckel BR, Bryan DJ, Moschella CJ. Common complications of wound healing. Prevention and management. *Surg Clin North Am*. 1991;71:1323-51.
- Daoud EG, Strickberger SA, Man KC, et al. Preoperative amiodarone as prophylaxis against atrial fibrillation after heart surgery. *N Engl J Med*. 1997;337:1785-91.