SEE Summaries of Emerging Evidence

SEE Question

You are responding to a code on the hospital floor. As you arrive, the patient is undergoing defibrillation for ventricular fibrillation. According to a recent study comparing administration of lidocaine versus amiodarone during in-hospital cardiac arrests refractory to defibrillation and cardiopulmonary resuscitation, which of the following outcomes is MOST likely if this patient receives lidocaine?

- ☐ (A) Lower rate of return of spontaneous circulation (ROSC)
- ☐ (B) Higher rate of survival at 24 hours
- ☐ (C) No difference in the rate of survival to discharge

The American Heart Association Advanced Cardiovascular Life Support (AHA ACLS) guidelines changed in 2018 to support the use of either lidocaine or amiodarone for cardiac arrest from ventricular tachycardia/ventricular fibrillation (VT/VF) that is refractory to defibrillation and cardiopulmonary resuscitation (CPR). This recommendation is based on randomized controlled trials for out-of-hospital cardiac arrest and is not necessarily applicable to in-hospital cardiac arrests. The authors of a recent large retrospective cohort study aimed to compare the effect of lidocaine versus amiodarone during in-hospital cardiac arrest on various clinical outcomes.

This study evaluated 14,630 adult patients with in-hospital VT/VF arrests in 696 hospitals from January 2000 to December 2014. These patients were treated with defibrillation (standard of care) plus lidocaine or amiodarone. Patients who did not receive defibrillation, who were administered both lidocaine and amiodarone, and with an arrest beginning outside of the hospital setting were excluded. The primary outcome was the rate of ROSC, and the secondary outcomes were survival at 24 hours, survival to hospital discharge, and favorable neurologic outcome. Covariates, such as age, race/ethnicity, preexisting conditions, event location, time of event, witnessed versus unwitnessed event, vitals monitoring, and time to defibrillation, were statistically controlled.

Amiodarone was used in 68.7% (n = 10,058) of VT/VF arrests, and lidocaine was used in 31.3% (n = 4,572). This preference for amiodarone is consistent with the AHA ACLS guidelines that previously recommended amiodarone as the first-line antiarrhythmic, until the reintroduction of lidocaine as a recommended treatment in 2018. Results of the unadjusted comparison between the lidocaine group and amiodarone group showed no difference in the rate of ROSC (absolute risk difference, 0.7; 95% CI, –1.2 to 2.7). The lidocaine group had a higher rate of survival at 24 hours (absolute risk difference, 4.3; 95% CI, 2.2 to 6.5), survival to hospital discharge (absolute risk difference, 5.5; 95% CI, 3.4 to 7.8), and favorable neurologic outcome at hospital discharge (absolute risk difference, 6.3; 95% CI, 3.9 to 8.6).

Once the previously described covariates were controlled for, the lidocaine group had higher odds of ROSC versus the amiodarone group (adjusted odds ratio [AOR], 1.15; 95% CI, 1.03 to 1.30). The lidocaine group also had higher odds of survival at 24 hours (AOR, 1.16; 95% CI, 1.05 to 1.28), survival to discharge (AOR, 1.19; 95% CI, 1.08 to 1.30), and favorable neurologic outcome at hospital discharge (AOR, 1.18; 95% CI, 1.07 to 1.30), compared with the amiodarone group.

There were several interesting predictors for both favorable and unfavorable outcomes. In the adjusted models, patients who were White, were admitted for a myocardial infarction, fell into a cardiac illness category, had a more recent admission, or had electrocardiographic monitoring were more likely to have all four favorable outcomes (ROSC, survival at 24 hours, survival to discharge, favorable neurologic outcome). Patients who were older, had several preexisting conditions (sepsis, hypotension or hypoperfusion, continuous vasopressors, metastatic or hematologic cancer, or renal insufficiency/dialysis), or had a longer time to defibrillation were less likely to have all four favorable outcomes.

In summary, this study demonstrated that lidocaine was associated with higher rates of ROSC, survival at 24 hours, survival to discharge, and favorable neurologic outcomes compared with amiodarone for in-hospital arrests from VT/VF refractory to defibrillation and CPR. Since the VT/VF algorithm in the current ACLS guidelines does not indicate a preference for type of antiarrhythmic, it is reasonable to choose lidocaine as a first choice based on this study. ■

References:

1. Wagner D, Kronick SL, Nawer H, Cranford JA, Bradley SM, Neumar RW. Comparative effectiveness of amiodarone and lidocaine for the treatment of in-hospital cardiac arrest. *Chest* 2023;163(5):1109-19. doi:10.1016/j.chest.2022.10.024
2. Murphy TW, Kadir S. Regarding the comparative effectiveness of lidocaine and amiodarone for treatment of in-hospital cardiac arrest. *Chest* 2023;163(5):1007-8. doi:10.1016/j.chest.2022.11.031

Answer: B