

safe and effective when used in combination with dual antiplatelet therapy.

In their investigation of a prospective cohort of patients with STEMI from the CLARITY-TIMI 28 trial, patients aged 18–75 years were treated with LMWH ($n = 1,429$) or UFH ($n = 1,431$) plus concurrent fibrinolytic therapy, with approximately 50% of each group also receiving clopidogrel. Treatment with LMWH was associated with a lower rate of infarct-related artery occlusion, death or myocardial infarction before angiography than UFH (adjusted odds ratio 0.76, 95% CI 0.60–0.97), and with a lower rate of cardiovascular death or recurrent myocardial infarction over a 30-day period (adjusted odds ratio 0.68, 95% CI 0.48–0.96). The improved outcomes associated with LMWH treatment were apparent even in patients concurrently receiving clopidogrel and aspirin, the combination of which did not promote excess bleeding.

In summary, the use of LMWH in patients with STEMI receiving fibrinolytic and antiplatelet therapy was associated with lower rates of cardiac adverse events and improved angiographic outcomes. An ongoing large-scale, randomized trial (EXTRACT-TIMI 25) should provide unequivocal evidence as to the benefit of treatment with LMWH in STEMI.

Kate Matthews

Original article Sabatine MS *et al.* (2005) Angiographic and clinical outcomes in patients receiving low-molecular-weight heparin versus unfractionated heparin in ST-elevation myocardial infarction treated with fibrinolytics in the CLARITY-TIMI 28 trial. *Circulation* 112: 3846–3854

Aspirin use before intracerebral hemorrhage increases mortality risk

Hematoma volume predicts outcome and mortality risk following intracerebral hemorrhage (ICH). Therapies that decrease coagulability could cause enlargement of hematomas, thereby increasing the risk of mortality in patients with ICH. Saloheimo *et al.* studied outcomes in ICH patients regularly taking aspirin or warfarin at presentation.

In this population-based investigation, patients with spontaneous ICH were identified by head CT scan ($n = 203$) or autopsy ($n = 5$) over a 33-month study course. Regular

aspirin use before ICH was significantly linked with hematoma enlargement in the week immediately following hemorrhage ($P = 0.006$). The 3-month mortality rate in all patients was 33%, and independent risk factors for death were regular aspirin use or warfarin use at onset of ICH (relative risk 2.5, 95% CI 1.3–4.6, $P = 0.004$, and 3.2, 95% CI 1.6–6.1, $P = 0.001$, respectively).

The results show that patients who had regularly used aspirin or warfarin before ICH were at increased risk of death within 3 months of onset compared with nonusers. In aspirin users, this increased risk probably results from early hematoma growth; however, the authors were unable to confirm this hypothesis because only some patients underwent second CT scans. Nevertheless, the results indicate a need to block hematoma growth and to stop anticoagulation in ICH patients taking regular aspirin or warfarin. Further work is required to test whether occasional aspirin use affects outcome after ICH, and whether the benefits of interventions that increase platelet function in ICH patients taking aspirin would outweigh their risks.

Kate Matthews

Original article Saloheimo P *et al.* (2006) Regular aspirin-use preceding the onset of primary intracerebral hemorrhage is an independent predictor for death. *Stroke* 37: 129–133

Medication adherence by patients with chronic heart failure

Medications and lifestyle alterations have been shown to reduce mortality in patients with chronic heart failure (CHF), but patients do not always adhere to such recommendations. Granger *et al.* used CHARM, a multi-center, randomized, placebo-controlled study that compared candesartan (an angiotensin-receptor blocker) with placebo in CHF patients, to investigate the association between adherence to medication and mortality in these patients.

In CHARM, 7,599 CHF patients (68% male) received placebo or 4–8 mg candesartan once daily, which was titrated upwards at minimum intervals of 2 weeks towards a target dose of 32 mg. At follow-up visits every 4 months, adherence to study drug or placebo was assessed. Adherence scores >80% were

GLOSSARY

CLARITY-TIMI 28

Clopidogrel as Adjunctive Reperfusion Therapy—Thrombolysis in Myocardial Infarction 28

EXTRACT-TIMI 25

Enoxaparin and Thrombolysis Reperfusion for Acute Myocardial Infarction—Study 25

CHARM

Candesartan in Heart failure: Assessment of Reduction in Mortality and morbidity