

was 11% per year, compared with 1% per year for the overall HCM population.

Variable patterns of left ventricular remodeling were observed in end-stage HCM. The 'classic' pattern of wall thickness regression, cavity dilatation and reduced ejection fraction was found in only approximately half of patients; more than a third of patients had a nondilated or hypertrophied left ventricle, or both. Systolic dysfunction, defined as an ejection fraction <50%, was the only consistent feature of end-stage HCM. A family history of HCM was present in 31 end-stage patients; 20 families had at least 1 relative who had died suddenly of HCM. Nine patients had at least one other relative with end-stage HCM. Diagnosis of HCM occurred 10 years earlier in patients who developed end-stage disease than in the overall study population.

The authors state that earlier recognition of end-stage HCM development is necessary for effective management of the condition and to allow timely evaluation for heart transplantation. The ability of cardiac MRI to detect ventricular fibrosis and scarring in patients with end-stage disease suggests the potential usefulness of the technique for early detection of at-risk patients.

**Original article** Harris KM *et al.* (2006) Prevalence, clinical profile, and significance of left ventricular remodeling in the end-stage phase of hypertrophic cardiomyopathy. *Circulation* 114: 216–225

## Increased risk of cardiovascular disease in women with migraine with aura

Women over 45 years of age who suffer from migraine with aura are at significantly higher risk of serious cardiovascular disease (CVD) than those who report no history of migraine, according to a recent study.

Kurth and co-workers performed a prospective cohort analysis of participants in the US-based Women's Health Study. Their investigation included 27,840 women aged 45 years or over, who were free from CVD and angina at study entry (1992–1995), and for whom data on self-reported migraine history and aura status, and lipid measurements were available. Overall, 5,125 (18.4%) women reported a history of migraine at baseline; 70.4% of these women had active migraine, of whom 39.7% reported aura symptoms.

Over the follow-up period (mean 10 years), 580 major CVD events were reported. Women with active migraine with aura were found to have a significantly increased risk of ischemic stroke (adjusted hazard ratio [HR] 1.91, 95% CI 1.17–3.10;  $P=0.01$ ), myocardial infarction (HR 2.08, 95% CI 1.30–3.31;  $P=0.002$ ), and ischemic CVD death (HR 2.33, 95% CI 1.21–4.51;  $P=0.01$ ) compared with women with no migraine history. Women with active migraine and no aura had similar incidence rates of vascular events and angina to women without migraine history. The data from this study indicated that, following age adjustment, there were 18 additional major CVD events attributable to migraine with aura per 10,000 women per year.

**Original article** Kurth T *et al.* (2006) Migraine and risk of cardiovascular disease in women. *JAMA* 296: 283–291

## Study demonstrates increasing prevalence of heart failure with preserved ejection fraction

Researchers at the Mayo Clinic College of Medicine have examined the effect of shifting population demographics and the prevalence of risk factors for heart disease on the incidence of heart failure with preserved ejection fraction (PEF).

In this retrospective study, 4,596 patients diagnosed with decompensated heart failure who had been admitted to Mayo Clinic hospitals in Rochester, MN, between 1 January 1987 and 31 December 2001 were analyzed. Patients with an ejection fraction of 50% or more were classified as having heart failure with PEF. Reduced ejection fraction (REF) was defined as an ejection fraction of less than 50%. Over the 15-year period examined, the average prevalence of PEF among patients diagnosed with heart failure increased considerably, owing to an increased number of PEF diagnoses with little change in the number of REF diagnoses. The age-adjusted incidences of hypertension and atrial fibrillation were higher among the PEF cohort than in the REF group. Notably, the overall prevalence of both hypertension and atrial fibrillation increased over the study period.

Although the baseline-adjusted survival was slightly lower for patients with REF than