www.nature.com/clinicalpractice/rheum

The cardiovascular threat of lupus

Joan M Von Feldt

In systemic lupus erythematosus (SLE) there is bimodal mortality; early mortality is attributable to complications of glomerulonephritis, neuropsychiatric lupus and infection, while late mortality is usually a result of cardiac and cerebrovascular events. This cardiovascular mortality in SLE is noteworthy, even after adjustment for traditional Framingham risk factors; in fact, SLE has been shown to be an independent risk factor for cardiovascular events. Furthermore, many researchers have shown that subclinical atherosclerosis, either assessed according to coronary artery calcification or measured by carotid duplex ultrasonography, is more common in SLE patients than age-matched controls, with a prevalence of about one-third in the cohorts studied (Von Feldt J *et al.* [2006] *Arthritis Rheum* 54: 2220–2227).

In the US, it has been found that women have higher cardiovascular mortality and are less likely to receive standard medical interventions after myocardial infarction than men. There is a double jeopardy, therefore, for young women with SLE. Advances in diagnostic technology, however, hold the promise of better prediction of increased cardiovascular risk in SLE patients.

Inflammatory markers of atherosclerotic cardiovascular disease in the general population, such as soluble CD154, high-sensitivity C-reactive protein and monocyte chemoattractant protein-1, do not, however, distinguish SLE patients with atherosclerosis from those without it (Von Feldt J *et al*. [2006] *Arthritis Rheum* 54: 2220–2227). In addition, no consistent association has been shown between blood lipid levels and arteriosclerotic cardiovascular disease in patients with SLE (Von Feldt J *et al*. [2006] *Arthritis Rheum* 54: 2220–2227). An elevated serum homocysteine level, however, has been associated with the presence and progression of subclinical arteriosclerotic cardiovascular disease in SLE patients; therefore, homocysteine is a useful and inexpensive marker (Von Feldt J *et al*. [2006] *Arthritis Rheum* 54: 2220–2227; Roman *et al*. [2007] *Arthritis Rheum* 56: 3412–3419).

Cardiovascular mortality in SLE is noteworthy, even after adjustment for traditional Framingham risk factors

The importance of inflammation and the immune system in the initiation and progression of atherosclerosis is becoming increasingly apparent. Acute coronary syndromes are caused by disruption of unstable atheroma, for which patients with SLE are believed to have a raised risk. Endothelial dysfunction is an early abnormality in atherosclerotic cardiovascular disease, and is present in the vasculature of SLE patients. Kaplan's group has identified reduced numbers of endothelial progenitor cells in SLE patients, which correlate with SLE disease activity indices (Denny MF *et al.* [2007] *Blood* 110: 2907–2915).

In a 2-year, randomized, prospective trial of atorvastatin in patients with SLE, progression of arteriosclerotic cardiovascular disease was slightly decreased when assessed by measurement of carotid intima–media thickness, but not when carotid plaque and coronary artery calcification were measured (Petri M *et al.* [2006] *Arthritis Rheum* 54: s520). Nevertheless, many clinicians follow the National Cholesterol Education Program Adult Treatment Panel III guidelines, which recommend the use of statins for the primary prevention of cardiovascular disease in high-risk patients, using SLE as a coronary heart disease risk factor equivalent to diabetes. Given the minimal effectiveness of statins in this patient population, however, the pathogenic mechanisms of cardiovascular disease in SLE patients require identification in order to develop more-effective therapies.

Aggressive management of modifiable cardiovascular risk factors, including hypertension, obesity and smoking, are of paramount importance for the cardiovascular health of SLE patients. In addition, improving education of our SLE patients by routine physician counseling will substantially raise patients' awareness and self-perception of SLE as a cardiovascular disease risk factor.

JM Von Feldt is Associate Professor of Medicine in the Division of Rheumatology, University of Pennsylvania School of Medicine, Philadelphia, PA, USA.

Competing interests
The author declared no competing interests.

www.nature.com/clinicalpractice
doi:10.1038/ncprheum0910