Autoimmune diseases & cardiovascular risk

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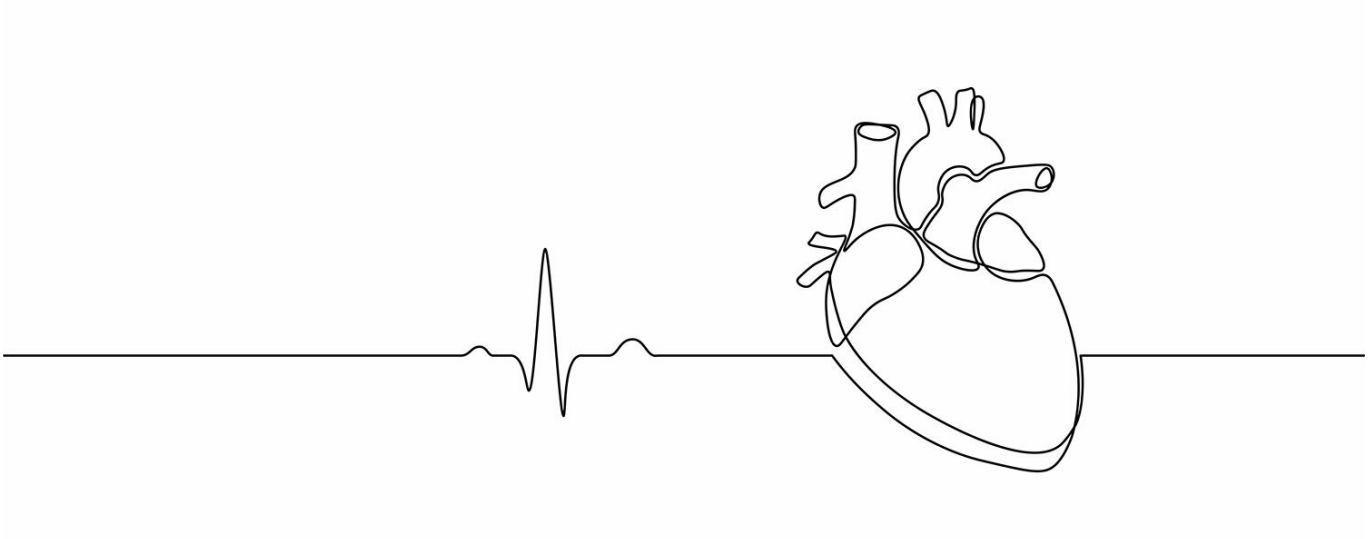

According to a recent epidemiological study, individuals with autoimmune disease have a higher risk of developing cardiovascular disease (CVD) than individuals without an autoimmune disease ([1]).

Autoimmune diseases are chronic conditions characterised by loss of immune tolerance, aberrant immune responses, and the production of autoantibodies that attack the body's tissues and organs, resulting in inflammation and damage ([2]). More than 80 autoimmune diseases have been recognised, collectively affecting 5-9% of the global population ([1],[3]). Given that their effects on morbidity and mortality are high, they represent a serious global public health threat.

Epidemiological studies have found that specific autoimmune diseases are associated with increased cardiovascular morbidity and mortality, including rheumatoid arthritis ([4],[5]), psoriasis ([6],[7],[8]), and systemic lupus erythematosus (SLE) ([9],[10]). However, most studies focused on one autoimmune disease entity at a time, had small sample sizes and short duration of follow-up and insufficiently assessed interactions with traditional cardiovascular risk factors, rendering the evidence inconclusive.

A recent population study of more than 22 million adults in the United Kingdom investigated 19 common autoimmune diseases as potential determinants of future cardiovascular events. The study's results show that patients with autoimmune conditions have an approximately 1.4–3.6 times higher risk of developing CVD than people without an autoimmune disorder, depending on the specific autoimmune disorder. This excess risk is comparable to other well-known cardiovascular risk factors, including type 2 diabetes, hyperlipidaemia, and hypertension. The highest cardiovascular risk was observed in systemic sclerosis, Addison’s disease, SLE, and type 1 diabetes.

The 19 autoimmune diseases investigated in the study accounted for 6.3% of cardiovascular events. Results of sensitivity analysis demonstrated that this excess risk was not attributable to other known cardiovascular risk factors, including age, sex, socioeconomic status, blood pressure, BMI, smoking, type 2 diabetes, or cholesterol.

Other significant findings were the early age of onset in those with autoimmune disease (< 45 years) and the accelerated course of atherosclerotic diseases, including ischaemic heart disease, peripheral arterial disease, and stroke or transient ischaemic attack. In addition, the risk of inflammatory cardiac disease (pericarditis and myocarditis) and degenerative heart disease (non-rheumatic valve disorders and heart failure) was also increased.

Chronic and systemic inflammation, attributed mainly to the presence of proinflammatory cytokines and autoantibodies, is likely to contribute to the higher observed cardiovascular risk among patients with autoimmune disease ([2],[11],[12],[13]). In autoimmune disease, a shift toward proinflammatory T helper 1 (Th1) and T helper 17 (Th17) cells and decreased function and number of anti-inflammatory T regulatory (Treg) cells promote an inflammatory environment ([14],[15],[16]). This chronic inflammation enhances endothelial dysfunction, induces maladaptive remodelling of the vascular wall, and causes plaque instability and rupture ([17],[18]).

Several other biological mechanisms are proposed to underlie the association between autoimmune disease and CVD. Defects in the complement system or in its regulatory proteins may contribute to the development of autoimmune diseases ([19]). These defects can also contribute to the development and progression of atherosclerosis by activating endothelial cells, stimulating cytokine release from vascular smooth muscle cells, and promoting plaque rupture ([20]). Complement activation also influences thrombosis through activation of platelets, promotion of fibrin formation, and impairment of fibrinolysis ([21]). Autoantibodies against protein antigens, nucleic acids, and lipids can cause endothelial and cardiomyocyte damage, vasculitis, and thrombosis and disrupt lipid homeostasis ([22],[23],[24],[25],[26],[27]).

A key limitation of the current study was the inability to account for the effect of concomitant medication on the association between autoimmune disease and cardiovascular risk. Previous studies have found that medications such as glucocorticoids enhance cardiovascular risk factors. These risk factors include obesity, insulin resistance, glucose intolerance, dyslipidaemia, and hypertension ([28],[29],[30]).

Conclusion

Emerging evidence indicates that autoimmunity and inflammation play a pivotal role in the pathophysiology of CVD. Therefore, the current study highlights that cardiovascular risk prevention should be considered an integral part of managing autoimmune disease.

Therapies that reduce systemic inflammation, such as polyphenols (e.g. curcumin ([31]), epigallocatechin gallate (EGCG) ([32]), and resveratrol ([33])) and omega-3 fatty acids ([34]), may be beneficial. In addition, managing traditional cardiovascular risk factors through a healthy diet, maintaining a healthy weight, exercising, managing stress, and not smoking are essential strategies for preventing and managing cardiovascular risk in autoimmune patients.

Further research is needed to understand the biological mechanisms linking autoimmune disease and cardiovascular morbidity and to design and assess the effectiveness of CVD prevention measures for patients with autoimmune disorders.

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