Medical Sciences

Update in Cardiovascular Disease in Patients With Rheumatic Diseases

Patompong Ungprasert¹ ²

¹Division of Rheumatology, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA. ²Department of medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

Over the past few decades, an increased incidence of cardiovascular diseases among patients with rheumatic illnesses has been increasingly recognized. Chronic inflammation is believed to be the pathogenetic link. This review aims to summarize the up-to-date evidence of role of inflammation in the pathogenesis of premature atherosclerosis and recent epidemiological studies in this area. Journal of Nature and Science, 1(3):e59, 2015.

Rheumatic disease | Cardiovascular disease | Premature atherosclerosis | Epidemiology

Introduction
Increased incidence of cardiovascular disease (CVD) in patient with rheumatic diseases has been observed for over a decade. Rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE) are the first two rheumatic disorders known to increase risk of coronary artery disease (CAD) and other CVD [1, 2]. Several subsequent epidemiological studies have demonstrated this increased risk among patients with other rheumatic diseases as well. The deleterious effect of chronic inflammation on endothelial cells has been shown to be the cornerstone of the mechanistic link [3]. This review aims to provide an up-to-date review of the pathogenesis of premature atherosclerosis in patients with selected autoimmune diseases as well as up-to-date summary of recent epidemiological studies.

Pathogenesis
The role of inflammation, the near-universal underlying process for autoimmune disorders, in the initiation and progression of atherosclerosis, the cornerstone of the pathogenesis of CAD, is well-recognized. It has been shown that endothelial dysfunction and direct endovascular injury from inflammatory cytokine, activated inflammatory cells and oxidative stress may accelerate the progression of atherosclerosis [4-8]. Furthermore, chronic inflammation has been demonstrated to promote the coagulation as cascade, resulting in a hypercoagulable state [9, 10], another predisposing factor for the development of coronary artery disease and other CVD.

Non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroid are two most commonly used drugs in patients with rheumatic diseases. Both medications are, however, notorious for their adverse effects [11-13], including on the cardiovascular system, which might be another contributory factor to the increased risk of CVD in these patients. NSAIDs, particularly specific COX-2 inhibitor, have been shown to increase risk of myocardial infarction and ischemic stroke, resulting in a withdrawal of one COX-2 inhibitor (rofecoxib) from the market [14]. A recent meta-analysis also suggested that subjects who used NSAIDs had a higher risk of developing venous thromboembolism [15, 16].

The effect of corticosteroids might be relatively less clear as epidemiological studies assessing their cardiovascular effect in patients with chronic inflammatory diseases yielded inconsistent results [17-19]. Use of corticosteroids is associated with an increased prevalence of atherosclerotic risk factors, including diabetes mellitus, hypertension, and dyslipidemia [20]. However, their anti-inflammatory property might provide a cardiovascular protective effect in patients with chronic inflammatory disorders, particularly on endothelial function [21].

Rheumatoid arthritis
RA is one of the first rheumatic diseases found to have an increased cardiovascular burden [1]. A recent meta-analysis of 24 observational studies had demonstrated a 59% and 52% excess mortality from coronary artery disease (CAD) and cerebrovascular disease, respectively [22]. Another meta-analysis found that patients with RA had a higher risk of venous thromboembolism (VTE) compared with general population with the risk ratio (RR) of 1.96 [23, 24].

Psoriatic arthritis
Psoriasis is well-known for co-morbidity [25, 26]. Since the association between CVD and RA has been recognized, attention has turned to the seronegative arthritis, particularly psoriatic arthritis (PsA) as well. A recent large population-based has demonstrated a 24% excess incidence of CVD in patients with PsA [27].

Idiopathic inflammatory myositis
Idiopathic inflammatory myositis (IIM) is a group of autoimmune disorder characterized by inflammation of skeletal muscle [28]. Dermatomyositis and polymyositis are the major subtype of IIM [29, 30]. Increased risk of CAD, stroke and VTE has been shown in recent meta-analyses with RR of 2.24, 1.61 and 2.85, respectively [31-33].

Systemic sclerosis
Increased incidence of CAD was demonstrated in a meta-analysis with RR of 1.82 [34] while increased incidence of ischemic stroke was demonstrated in a large population-based study (RR of 1.43) [35].

Giant cell arteritis
Giant cell arteritis (GCA) is the most common form of vasculitis in Western countries and is characterized by medium and large-vessel granulomatous arteritis. GCA typically affects adults older than 50 years of age with a peak incidence among those aged 75-85 years [36]. Interestingly, a recent meta-analysis of six studies comprised of 10,886 patients did not find statistically significant elevated risk of CAD among patient with GCA [37]. One possible explanations for this negative result is related to a lower baseline CVD risk as several studies have found a lower prevalence of diabetes mellitus (DM) and dyslipidemia among patients with GCA compared with non-GCA controls [38-40].

Mixed connective tissue disease
Cardiac involvement is common in patients with mixed connective tissue disease (MCTD) [41]. However, with the rarity of the disease, there is not population-based study to assess CVD risk among patients with MCTD compared with general population.

Conflict of interest: No conflicts declared.
Corresponding Author: Patompong Ungprasert, MD. 200 1st street SW, Rochester, MN, USA. Tel 507-284-2511. E-mail: Ungprasert.Patompong@mayo.edu; P.Ungprasert@gmail.com. © 2015 by the Journal of Nature and Science (JNSCI).
Summary
Cardiovascular complications are common in patients with rheumatic diseases. Physicians should be aware of this association, and an appropriate management for conventional cardiovascular risk factor modification should be incorporated to the routine care for these patients.