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Systemic Lupus Erythematosus: Cardiovascular Pathophysiology
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Pathophysiological Disease Process
- SLE activates the immune system and the complement cascade.
- The chronicity of this activation theoretically contributes to atherosclerosis (Ammirati et al., 2014).
- “Atherosclerosis is an inflammatory disease initiated by dysfunction of the endothelial cells of the vasculature… resulting in damage to the endothelial layer of the arterial wall” (Turano, 2013, p. 49).
- Inflammation stimulates macrophages, cytokines, T cells and oxidation of low-density lipoproteins (LDLs)
- The cycle continues, “macrophages release growth factor that produces collagen forming a cap [plaque] over the accumulation of inflammatory cells, lips and necrotic tissue” (Turano, 2013, p. 49).
- The obstruction limits blood flow or can rupture.

Signs and Symptoms
- “Dyspnea
- Cough
- Fever
- Chest pain
- Abdominal/flank pain
- Skin rash
- Decreased urine output
- Ankle swelling
- Elevated C-reactive protein
- Anti-ds DNA

The measurement of increased endothelial dysfunction from the FMD correlation may correspond with increased cardiovascular dysfunction (Barsalou et al, 2016)
SLE is linked to an increased rate of hypertension and premature cardiovascular disease (Gilbert & Ryan, 2014).

5. Importance of regular exercise which was reported to show “no impairment in macro- or microvascular function...compared with healthy controls” (Barnes, Nuimlin, Dhillna, Renzi & Tanaka, 2014, p. 213).

Conclusion
- SLE is a complicated disease.
- A collaborative effort between Advanced Practice Nurses and patients is necessary to ensure success on the wellness continuum.
- Success is achieved through recognizing, educating and managing the cardiovascular risks associated with SLE.

References

Implications for Nursing Care
- Advanced Practice Nurses should monitor SLE patients:
  1. Hypertension
  2. Heart failure
  3. Diabetes mellitus
  4. Labile blood pressure, serum creatinine, potassium, proteinuria
  5. Echocardiogram

• Advanced Practice Nurses should educate SLE patients regarding cardiovascular risk factors:
  1. Control blood pressure
  2. Smoking cessation
  3. Dietary restriction

Significance of Pathophysiology
- “Endothelial dysfunction leads to atherogenesis
- Lack of homoeostasis between vasodilation/vasoconstriction may accelerate vascular damage
- Increased thrombosis
- Impaired clearance of apoptotic cells
- Skewed Th1 activation
- Increased/ changed activation of T cells
- B-cell activation
- LDL oxidation leads to increased inflammation, plaque formation of the arterial intima
- Increased thrombosis
- Pericarditis, myocarditis and endocarditis” (Wigren, Nilsson & Kaplan, 2015, pp. 497-498).


What is SLE?
- Systemic lupus erythematosus (SLE) is an autoimmune disease potentially chronic inflammation throughout the human body.
- “Antinuclear antibodies react with circulating antigens to form complexes that can deposit in...kidney[s], brain, heart, lungs and vasculature” (Turano, 2013, p. 49).
- Gilbert and Ryan (2014) report SLE predominately affects females between 20-40 years of age, but can begin in childhood.

Aim
- SLE is a multisystem disease.
- The focus of this research is to gain an understanding of the cardiovascular implications of SLE.
- Mak and Kow (2014) found “lupus patients older than 35 are >50 times more likely to develop [cardiovascular disease] (CVD) than their age and sex linked counterparts” (p. 1).
- Advanced Practice Nurses are essential to recognizing, screening and managing care for persons affected with SLE (Weinstein et al., 2014).