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Jennifer L. Mullins

Otterbein University, jennifer.mullins@otterbein.edu

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Systemic Lupus Erythematosus: Cardiovascular Pathophysiology

Jennifer L. Mullins, RN, BSN, PCCN
Otterbein University, Westerville, Ohio

What is Lupus?



Tiffany Kenley (n.d.) Retrieved from <http://slideplayer.com/slide/1427056/>

Introduction

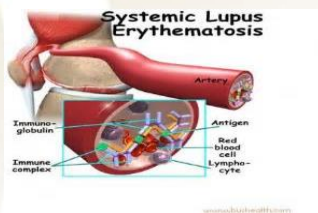
- Systemic lupus erythematosus (SLE) is an autoimmune disease potentiating chronic inflammation throughout the human body.
- “Autoantibodies react with circulating antigens to form complexes that can deposit in...kidney[s], brain, heart, lungs and vasculature” (Turano, 2013, p. 49).
- Gilbert and Ryan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

Aim

- SLE is a multifaceted 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).

Pathophysiological Disease Process

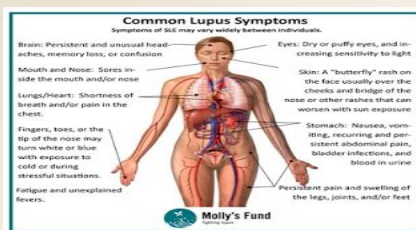
- SLE activates the immune system and the complement cascade.
- The chronicity of this activation theoretically contributes to atherosclerosis (Ammirati et al., 2014).
- “Atherosclerosis is an inflammatory disease initiated by dysfunction of the endothelial cells of the vasculature... resulting in damage 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, lipids and necrotic tissue” (Turano, 2013, p. 49).
- The obstruction limits blood flow or can rupture



What is systemic lupus(2014). Retrieved from: www.bushelath.com/1000-discovery-what-is-systemic-lupus-erythematosus-sle/

Signs and Symptoms

- “Dyspnea
- Cough
- Fever
- Chest pain
- Abdominal/flank pain
- Skin rash
- Decreased urine output
- Arthralgia
- Elevated C-reactive protein
- Anti-ds DNA
- Elevated troponin I
- Anemia
- Proteinuria
- Sinus tachycardia
- Pericardial effusion
- Mitral valve regurgitation
- Cardiomegaly” (Chen, Chang, Hsu, Liao & Chen, 2014, p. 1118).



SLE (2013). retrieved from: www.med4alcom.com/2013/05/diagnosis-of-systemic-lupus.html

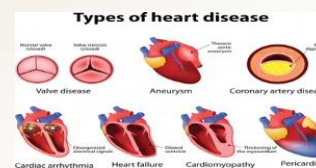
Underlying Pathophysiology

- “Endothelial dysfunction leads to atherogenesis
- Lack of homeostasis between vasodilation/vasoconstriction may accelerate vascular damage
- Increased thrombosis
- Impaired clearance of apoptotic cells
- Skewed Th 1 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).

Significance of Pathophysiology

- Barsalou et al (2016) found patients with childhood-onset SLE had a “statistically significant correlation of flow-mediated dilation (FMD) with disease duration” (p. 241).

- 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).



Lupus and the Heart. (2014). Retrieved from: www.belmarrhealth.com/lupus-and-pericarditis-effect-of-lupus-on-heart-health/

Implications for Nursing Care

- Advanced Practice Nurses should monitor SLE patients:
 - “Hypertension
 - Heart failure
 - Diabetes mellitus
 - Labs- lipids, serum creatinine, potassium, proteinuria
 - Echocardiogram” (Tselios, Koumaras, Urowitz & Gladman, 2014, p. 523)
- Advanced Practice Nurses should educate SLE patients regarding cardiovascular risk factors:
 - “Control blood pressure
 - Smoking cessation
 - Dietary restriction
 - Use of antihypertensives, statins and low dose aspirin” (Tselios, Koumaras, Urowitz & Gladman, 2014, p. 523).

5. Importance of regular exercise which was reported to show “no impairment in macro- or microvascular function...compared with healthy controls” (Barnes, Nualnim, Dhindsa, 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.
- Weinstein et al. (2014) report an increase in cardiovascular risk the first 3 years of SLE, “early aggressive treatment may improve overall survival rates” (p. 137).

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