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CME Questions December # 1-8

Research articles on intercellular adhesion molecule (ICAM)-1 deficiency, cellular alterations in the pedunculopontine nucleus (PPN) in Parkinson disease, and preeclamptic plasma regulation of endothelial cell genes were selected for the December 2013 AJP CME Program in Pathogenesis. The authors of the referenced articles and the planning committee members and staff have no relevant financial relationships with commercial interests to disclose.


Upon completion of this month’s journal-based CME activity, you will be able to:

- Discuss sarcoidosis.
- Describe Propionibacterium acnes and its role in sarcoidosis.
- Discuss the function of intercellular adhesion molecule (ICAM)-1.
- Describe the characteristics of Parkinson disease patients.
- Understand how preeclampsia affects pregnancy.
- Discuss the role of endothelial cell activation in preeclampsia.

1. **Sarcoidosis is a systemic granulomatous disease. Based on the referenced article, select the ONE statement that is NOT TRUE:** [See Am J Pathol 2013, 183:1731-1739.]

   a. Sarcoidosis is characterized by a variable clinical presentation and course.
   b. Sarcoidosis is associated with exposure to various microbial agents and environmental substances.
   c. There is substantial evidence that Chlamydia and Borrelia infections cause sarcoidosis.
   d. The organs most commonly affected by sarcoidosis include lungs, lymph nodes, and skin.

2. **Propionibacterium acnes is an anaerobic, non–spore-forming, gram-positive rod bacterium. Based on the referenced article, select the ONE statement that is NOT TRUE:** [See Am J Pathol 2013, 183:1731-1739.]

   a. *P. acnes* can be isolated from sarcoïd lesions.
   b. Data show an increase in *P. acnes* genome levels in the mediastinal or superficial lymph nodes of sarcoid patients.
   c. An immune response against indigenous *P. acnes* already exists in the healthy lung.
   d. Extrapulmonary sensitization results in a decrease in the numbers of recirculating *P. acnes*–primed cells in the lung.
3. **Sarcoidosis granuloma involves infiltration of leukocytes, predominantly macrophages.** Based on the referenced article, select the ONE statement that is NOT TRUE: [See Am J Pathol 2013, 183:1731-1739.]

   a. Leukocyte recruitment into inflammatory sites is achieved using constitutive or inducible expression of multiple cell adhesion molecules.
   b. L-selectin (CD62L), E-selectin (CD62E), and P-selectin (CD62P) primarily mediate leukocyte capture and rolling on the endothelium.
   c. L-selectin is constitutively expressed by most leukocytes.
   d. P-selectin expression is induced within several hours after activation with inflammatory cytokines.

4. **Intercellular adhesion molecule (ICAM)-1 (CD54), a member of the immunoglobulin superfamily, is constitutively expressed on endothelial cells, fibroblasts, and epithelial cells.** Based on the referenced article, select the ONE statement that is NOT TRUE: [See Am J Pathol 2013, 183:1731-1739.]

   a. ICAM-1 is down-regulated transcriptionally by tumor necrosis factor (TNF)-α, interferon (IFN)-γ, and IL-1.
   b. ICAM-1 forms the counter-receptor for the lymphocyte β2-integrins, such as lymphocyte function–associated antigen (LFA)-1.
   c. The ICAM-1/LFA-1 interaction mediates firm adhesion and transmigration of leukocytes at sites of inflammation.
   d. ICAM-1/LFA-1 interaction functions as a co-stimulatory signal for T-cell activation.

5. **Patients with Parkinson disease (PD) present with a multitude of motor-related disabilities, including progressive resting tremor, rigidity, bradykinesia/akinesia, gait disturbances, and postural instability.** Based on the referenced article, select the ONE statement that is NOT TRUE: [See Am J Pathol 2013, 183:1826-1840.]

   a. PD impairs various nonmotor functions including mood, cognition, sleep, autonomic nervous system functions, and sensory functions.
   b. A neuropathological signature of PD is the progressive deterioration of dopamine-producing neurons in the substantia nigra pars compacta (SNpc).
   c. Studies of human postmortem brains of patients with PD found a deficiency of complex II of the mitochondria respiratory chain in the SNpc.
   d. Some PD patients display defects of mitochondrial respiratory chain complexes II and III in the blood platelets.

6. **PD symptoms could result from disruption to multiple neural regions and systems.** Based on the referenced article, select the ONE statement that is NOT TRUE: [See Am J Pathol 2013, 183:1826-1840.]

   a. The pedunculopontine nucleus (PPN) is important for regulating some of the physiological functions that fail during progressive PD.
   b. PPN axons project toward but do not receive input from brain regions like the thalamus, SN, and cortical regions.
   c. A neuropathological hallmark of PD is the presence of intracytoplasmic Lewy bodies (LBs) and Lewy neurites (LN).s.
   d. LBs and LNs are seen within the remaining PPN neurons in the postmortem brains of patients with PD.

7. **Preeclampsia is a pregnancy disorder characterized by hypertension and proteinuria.** Based on the referenced article, select the ONE statement that is NOT TRUE: [See Am J Pathol 2013, 183:1993-2006.]

   a. Preeclampsia affects approximately 1% to 3% of pregnancies.
   b. Preeclampsia is capable of causing both maternal and fetal morbidity and mortality.
   c. The maternal syndrome develops after 20 weeks of gestational age.
   d. The maternal syndrome is characterized by elevated blood pressure, proteinuria, systemic endothelial cell (EC) dysfunction, and inflammation.

8. **In preeclampsia, the placenta releases factors into the maternal circulation that cause a systemic endothelial dysfunction.** Based on the referenced article, select the ONE statement that is NOT TRUE: [See Am J Pathol 2013, 183:1993-2006.]

   a. Increased levels of anti-angiogenic factors are found in the plasma of preeclamptic women.
   b. Maternal endothelial dysfunction in preeclampsia is revealed by structural modifications of the ECs of the kidney glomeruli.
   c. Incubation of ECs with preeclamptic plasma decreases the expression and the production of platelet-derived growth factor, vascular cell adhesion molecule 1 (VCAM-1), and ICAM-1.
   d. Targeted studies have shown that the plasma from preeclamptic women is able to elicit specific responses in human ECs in vitro.