FIT Board Review Corner – June 2017

Welcome to the FIT Board Review Corner, prepared by Tammy Peng, MD, and Amar Dixit, MD, senior and junior representatives of ACAAI’s Fellows-In-Training (FITs) to the Board of Regents. The FIT Board Review Corner is an opportunity to help hone your Board preparedness.

Review Questions

Allergy and Immunology Review Corner: Middleton’s Allergy Principles and Practice, 8th Edition
N. Franklin Adkinson Jr., MD, Bruce S Bochner, MD, A Wesley Burks, MD, William W Busse, MD, Stephen T Holgate, MD, DSc, FMedSci, Robert F Lemanske, Jr., MD and Robyn E O’Hehir, FRACP, PhD, FRCPath

Chapter 38 (pages 603-615): Immune Complex-Mediated Diseases
Prepared by: Kara Wada, MD

1. Immune complexes tend to be largest under which of the following conditions?
   a. Extreme antigen excess
   b. Extreme antibody excess
   c. Extreme antibody excess
   d. Inhibition of bradykinin catabolism.

2. Which of the following is the most common form of bradykinin-mediated angioedema syndromes?
   a. Type I HAE
   b. CR2
   c. FcγRI
   d. FcγRII

3. These specialized cells aid in the development of germinal centers by binding but not endocytosing immune complexes for weeks to months at a time.
   a. CD4+ T cells
   b. Follicular helper cells
   c. Plasmacytoid dendritic cells
   d. Follicular dendritic cells
4. What has been shown to be the earliest event in an active Arthus reaction?
   a. Margination of the polymorphonuclear cells
   b. Immune complex and complement deposition
   c. Intravascular platelet clumping
   d. Red blood cell extravasation

5. Which pathophysiologic condition is more characteristic of acute serum sickness as opposed
to chronic serum sickness as demonstrated in the rabbit model?
   a. Arteritis
   b. Nephritis
   c. Arthritis
   d. Urticarial rash

6. How long after drug initiation does serum sickness typically develop in a patient with no prior
   exposure to the medication in question?
   a. 24-48 hours
   b. 3-5 days
   c. 1-3 weeks
   d. 1-2 months

7. Which medications are most commonly implicated in drug-induced serum sickness?
   a. Penicillins, sulfonamides, beta blockers
   b. Sulfonamides, hydantoins, ACE-inhibitors
   c. Thiazides, penicillins, antihistamines
   d. Tranexamic acid

8. Which of the following statements is true?
   a. Use of an indwelling catheter or port for prophylactic C1INH administration is
      encouraged due to frequent infusions.
   b. Low levels of circulating immune complexes correlates with high clinical disease activity.
   c. Circulating immune complexes and FcγR-specific clearance defects are believed to be
      important in SLE pathogenesis.
   d. They have increased numbers of CR1 receptors on their erythrocytes.

9. Which glomerular disease is associated with anti-glomerular basement membrane zone
   antibodies?
   a. Goodpasture syndrome
b. Poststreptococcal glomerulonephritis  
c. Lupus nephritis  
d. Membranoproliferative glomerulonephritis

10. Which therapy for autoimmune diseases and its mechanism are correctly paired?  
   a. Rituximab depletes plasma cells  
   b. Proteosome inhibitors (bortezomib) destroy CD20 cells.  
   c. Plasmapheresis removes antibodies and/or immune complexes.  
   d. IVIG causes a downregulation through FcγRI receptors.
Answers

At equivalence, immune complexes tend to be large because the chances for cross-linking are optimized.

Large immune complexes efficiently activate complement by rapidly binding to the CR1 (CD35/C3b receptor) on the surface of RBCs which then transport them to the liver for Kupffer cells to remove and phagocytose them.

Follicular dendritic cells (FDCs) are associated with germinal cell development. FDCs bind but do not endocytose immune complexes and are able to harbor complexes on their surface for weeks to months at a time. Immune complex-bound FDCs are crucial for the growth and maintenance of high-affinity B cells in the germinal center and the subsequent production of high-affinity antibody.

Immunofluorescent studies show that the earliest event in active Arthus reactions is the deposition of antigen-antibody complexes and complement in and around blood vessel walls.

5. A, page 609.
In the rabbit model of chronic serum sickness, animals did not develop arteritis which was characteristic of acute serum sickness.

Generally, serum sickness occurs 1 to 3 weeks after the start of administration of the medication. It can occur within 12-36 hours in patients who have been previously sensitized to the medication.

Fc-mediated reticuloendothelial system (RES) clearance has been shown to be defective. High levels of circulating immune complexes correlate with high clinical disease activity. Circulating immune complexes and FcγR-specific clearance defects are believed to be important in SLE pathogenesis. They have decreased numbers of CR1 receptors on their erythrocytes.

Goodpasture syndrome is associated with anti-glomerular basement membrane antibodies whereas the remaining 3 conditions are associated with immune complex deposits causing a “lumpy-bumpy” pattern on immunofluorescence.

Rituximab depletes CD20 B cells whereas proteasome inhibitors destroy plasma cells. IVIG causes a downregulation through FcγRIIB receptors.