

Kumar: Robbins and Cotran Pathologic Basis of Disease, 9th Edition

Chapter 02: Cellular Responses to Stress and Toxic Insults: Adaptation, Injury, and Death

Test Bank

MULTIPLE CHOICE

1. A 60-year-old man who had generalized atherosclerosis died 24 hours after having a stroke. A cerebral infarct was found at autopsy. Necrosis of the brain is classified as
 - a. coagulative necrosis
 - b. liquefactive necrosis
 - c. fat necrosis
 - d. fibrinoid necrosis
 - e. caseous necrosis

ANS: B, Brain infarcts are characterized by liquefactive necrosis.

2. A 30-year-old woman who had leukemia was treated with bone marrow transplantation. She developed a skin rash that was interpreted as a sign of a graft-versus-host reaction. A skin biopsy was performed. In the epidermis, there were scattered dead epidermal cells that had rounded contours and pyknotic nuclei. This form of cell death is caused by
 - a. activation of caspases through receptor transmitted signals on the cell surface
 - b. inhibition of ATPase
 - c. inhibition of oxidative phosphorylation
 - d. activation of lysosomal enzymes
 - e. depletion of glycogen

ANS: A, Graft-versus-host-induced cell death in the epidermis is a form of apoptosis. It is mediated by caspases and other enzymes of the suicide pathway of "programmed cell death."

3. Uptake of bacteria into the cytoplasm of neutrophilic leukocytes is called
 - a. autophagocytosis
 - b. heterophagocytosis
 - c. exocytosis
 - d. pinocytosis
 - e. involution

ANS: B, Uptake of bacteria and other exogenous particulate material into the phagosomes is called phagocytosis.

4. A 90-year-old man died in a nursing home. During the past 10 years, he was unable to care for himself and was mentally incoherent. He had no memory and could not hold a conversation. He was unaware of his surroundings. At autopsy, the brain showed signs of Alzheimer disease, and there were neurons containing numerous neurofibrillary tangles. These cytoplasmic structures are formed from which component of the neurons?
- Nucleus
 - Rough endoplasmic reticulum
 - Smooth endoplasmic reticulum
 - Mitochondria
 - Cytoskeleton

ANS: E, Neurofibrillary tangles are composed of microtubule-associated proteins and neurofilaments, which form the cytoskeleton of nerve cells.

5. Continuous expression of the gene for atrial natriuretic factor in the myocardial cells of the left ventricle is typically a consequence of
- myocardial infarction
 - angina pectoris
 - hypertension
 - hypotension
 - ventricular fibrillation

ANS: C, Atrial natriuretic factor (ANF) is produced during fetal life in both the atrial and ventricular cells of the heart. After birth, the ANF gene remains active only in the atrium, but can be activated in ventricular cells undergoing hypertrophy. Arterial hypertension is the most common cause of ventricular hypertrophy.

6. Ubiquitin-proteasome degradation of plasma proteins is opposed by
- insulin
 - interleukin-1
 - tumor necrosis factor α
 - glucocorticoids
 - thyroid hormones

ANS: A, Insulin can oppose ubiquitin-proteasome degradation of plasma proteins, whereas all other hormones and mediators of inflammation listed here accelerate it.

7. A 28-year-old man was found to have cirrhosis of the liver and pulmonary emphysema. The liver cells contained globular inclusions in their cytoplasm, which by electron microscopy are shown to be located inside the
- Golgi apparatus
 - smooth endoplasmic reticulum
 - rough endoplasmic reticulum
 - mitochondria
 - peroxisomes

ANS: C, The clinical history (i.e., the concurrence of cirrhosis and pulmonary emphysema) suggests that this young man has α_1 -antitrypsin (AAT) deficiency. The cytoplasmic globules in the liver cells represent misfolded AAT, which cannot be excreted from the liver cells and remains inside the liver cells in the dilated cisterns of the rough endoplasmic reticulum.

8. A 60-year-old obese man was admitted to the hospital for treatment of alcoholism. He has diabetes mellitus. A liver biopsy was performed, and the specimen showed that the liver cells contain increased amounts of
- hemosiderin
 - bile
 - triglycerides
 - bilirubin
 - insulin

ANS: C, The three most common causes of fatty liver are obesity, alcoholism, and diabetes mellitus. Fat is stored in the liver cells predominantly in the form of triglycerides.

9. A 55-year-old man who was on renal dialysis was admitted to the hospital for evaluation of nausea and vomiting. A gastric biopsy was performed. The gastric mucosa contained foci of amorphous, bluish (basophilic) material forming aggregates 10-20 μm in diameter. These aggregates were seen mostly in the stroma between the foveolar cells. No other abnormalities were seen, and the pathologist concluded that these changes represent evidence of
- Helicobacter pylori* infection
 - peptic ulcer formation
 - dystrophic calcification
 - metastatic calcification
 - apoptosis

ANS: D, Bluish material in the stroma of the stomach represents foci of calcification. In patients who have chronic renal disease, such calcifications occur in the stomach, the lungs, or the kidneys, and are classified as metastatic. Metastatic calcifications occur in patients who have hypercalcemia, which in this patient was most likely caused by secondary hyperparathyroidism.