BIO 186 : General Pathology

Quizzes

2003
Bio 186: General Pathology Quiz #1 (Cellular Injury, Inflammation, Wound Healing)
February 14, 2003

Short answer questions:

1. List the three major kinds of cellular adaptive responses. Define each one. Give an example of each.

<table>
<thead>
<tr>
<th>Cellular Adaptive Response</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>hyperplasia</td>
<td>inc. in cell #</td>
<td>glands in lactating breast</td>
</tr>
<tr>
<td>metaplasia</td>
<td>change from one differentiated cell state to another</td>
<td>epithelium in smoker’s lungs (columnar $\rightarrow$ st. squamous)</td>
</tr>
</tbody>
</table>

2. Cellular injury can be reversible, or irreversible. What are the two major morphological (histological) manifestations of reversible cell injury?

- cloudy swelling
- chromatin clumping

3. Fill in the blanks in this schematic diagram of apoptosis.

4. What are the two main cellular mechanisms responsible for the transition from reversible to irreversible injury?

- loss of plasma membrane permeability
- loss of mitochondrial membrane permeability (formation of calcium deposits in mitochondria)
5. Carbon Tetrachloride toxicity is mediated by metabolism to a free radical (CCl₃) in the __________ system of the __________ organelle.

6. Free radical injury causes damage to cellular membranes by inducing __________ peroxidation (process).

7. The three major types of alcoholic liver disease are: __________, __________, and __________.

8. What are the two major cytokines that are responsible for the systemic signs and symptoms of inflammation? (Both are produced by macrophages!) __________ & __________

9. What cell has a central role in the __________ of acute inflammation? __________

10. The potential outcomes of acute inflammation are: __________, __________, __________, and __________.

11. The histological hallmark of the disease caused by mycobacterium tuberculosis is the __________ tissue.

12. In the process of wound healing, the ingrowth of proliferating fibroblasts and new capillaries is known as __________.

13. __________ and __________ are molecules responsible for the adhesion, rolling, and transmigration of leukocytes during inflammation.

True / False Questions (TF):

2. Apoptotic hepatocytes localized in the perportal region are characteristic of chronic inflammation caused by persistent viral hepatitis.

15. Histological characteristics of apoptotic cells include: chromatin fragmentation, cellular swelling, and apoptotic bodies, with moderate surrounding inflammation.

16. The two major cytokines that play a role in chronic granulomatous inflammation are bradykinin & histamine.

17. Reactive oxygen species are important mediators of reperfusion injury following ischemia.

18. The “MAC” complex (“membrane attack complex”) is made up of C5-9.

19. BFGF and VEGF are major mediators of angiogenesis during wound healing.

20. The major cells responsible for acute inflammation are: macrophages, platelets, & mast cells.
1. Complete the following table:

<table>
<thead>
<tr>
<th>Type of Hypersensitivity</th>
<th>Known as (major mechanism):</th>
<th>Example of Disease:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td><strong>anaphylaxis</strong> <em>(IgE mediated)</em> acute asthma</td>
<td></td>
</tr>
<tr>
<td>Type II</td>
<td><strong>cytotoxic</strong> <em>(antibody against Ag)</em> Goodpasture's Syndrome</td>
<td>that are an integral part of cell or tissue</td>
</tr>
<tr>
<td>Type III</td>
<td><strong>immune-complex</strong> <em>(Ab against soluble Ag... deposited in tissues and vessels)</em> - innocent bystander damage</td>
<td>SLE</td>
</tr>
<tr>
<td>Type IV</td>
<td><strong>cell-mediated</strong> <em>(CD4+ T cell) tuberculin (PPD) test</em></td>
<td>PT; CD8+ (CTL) cytotoxicity</td>
</tr>
</tbody>
</table>

2. The most important types of cells involved in Type I hypersensitivity reactions are:
   - mast cells
   - basophils
   - eosinophils

3. The most important cell type involved in delayed hypersensitivity reactions is the
   - macrophage

4. What is Der p? Der p is a(n) **peptide** allergen from the house dust mite. It causes
   - asthma
   - (clinical syndrome) by digesting through
   - occludin (tight junctions) between epithelial cells, and gaining access to the
   - submucosa, where it sets up a Type **I** hypersensitivity reaction.

5. Goodpasture's Syndrome is an example of a Type **II** Hypersensitivity reaction. The target
   - organs affected by this disease are: **kidney** and **lung**. This disease is
   - caused by antibodies that are directed against **collagen IV** and **VI**, which is located
   - in the **basement membrane**.

6. The immediate reaction of anaphylaxis upon exposure to an antigen requires
   - sensitization. (If you don’t have this, you can’t get anaphylaxis to a particular antigen).
7. An example of a disease caused by anti-receptor interactions would be \textit{Myasthenia gravis.}

8. What type of immune cell is a Th2 cell? (helper T cell, differentiated) \textit{important in type I reactions.}

9. What type of immune cell mediates Type IV cytotoxicity? \textit{CD8\(^+\) (CTL).}

10. Linear deposition of IgG and complement in the basement membrane of the glomerulus is seen in \textit{Goodpasture's disease.}

11. A "lumpy bumpy" pattern of deposition of IgG and complement in the basement membrane of the glomerulus is seen in \textit{SLE disease.}

12. Give one example of an early mediator and one example of a late mediator released from mast cells in Type I reactions:
   - Early: \textit{Histamine}
   - Late: \textit{Leukotrienes}

13. The most serious outcome of a Type I hypersensitivity reaction is \textit{anaphylactic shock} and death.

True/False (T/F):

14. The "Wheat and Flare" reaction is an example of a Type I Hypersensitivity reaction. \textbf{F}

15. The histological findings in chronic asthma include: thick basement membrane, leukocytic infiltration of submucosa, edema, eosinophils, increased mucous glands, and muscle hypertrophy. \textbf{F}

16. The clinical signs and symptoms of Poison Ivy are due to immune-complex deposition. \textbf{F}

17. IgG is a key mediator in allergic rhinitis and hayfever. \textbf{T}

18. Hemolytic anemias are often caused by complement-mediated destruction of red blood cells. \textbf{T}

19. Serum sickness is a Type I hypersensitivity reaction, and involves mast cell degranulation. \textbf{F}

20. Polymorphonuclear cells are major effector cells in delayed hypersensitivity reactions. \textbf{F}
## Answer Key

Bio 186: General Pathology  Quiz #2 (Immunopathology)  February 28, 2003

1. Complete the following table:

<table>
<thead>
<tr>
<th>Type of Hypersensitivity</th>
<th>Known as (major mechanism):</th>
<th>Example of Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Immediate / Anaphylactic</td>
<td>Anaphylactic shock</td>
</tr>
<tr>
<td>Type II</td>
<td>Hypersensitivity against antigens</td>
<td>Graft rejection, serum sickness</td>
</tr>
<tr>
<td>Type III</td>
<td>Transverse Connective</td>
<td>Rheumatoid Arthritis</td>
</tr>
<tr>
<td>Type IV</td>
<td>Cell-mediated (Dead cell mediated)</td>
<td>Contact dermatitis, Eczema</td>
</tr>
</tbody>
</table>

2. The most important types of cells involved in Type I hypersensitivity reactions are: **T mast cells, histamine, and degranulate**

3. The most important cell type involved in delayed hypersensitivity reactions is the **macrophage in T cells**

4. What is DQ? DQ is a **histocompatibility (HLA and DR)**

5. Coombs' Syndrome is an example of a **Type III** hypersensitivity reaction. The target organ affected by this disease are **cells and kidney**. This disease is caused by antibodies that are directed against **RBC membrane**, which is located in the **bone**.

6. The immediate reaction of anaphylaxis upon exposure to an antigen requires **IgE, basophil, histamine.** (If you don't have this, you can't get anaphylaxis to a particular antigen.)

7. An example of a disease caused by anti-precipitin interaction would be **Graft vs. Host Reaction**.

8. What type of immune cell is a Th1 cell? **CD4**

9. What type of immune cell mediates Type IV cytotoxicity? **CD8**

10. Linear deposition of IgG and complement in the basement membrane of the glomerulus is seen in **Goodpasture's disease**.

11. A "honey moon" pattern of deposition of IgG and complement in the basement membrane of the glomerulus is seen in **SLE** (disease).

12. Give one example of an early mediator and one example of a late mediator released from mast cells in Type I reaction:

   Early: **Histamine**  Late: **Leukotriene C4**

13. The most serious outcome of a Type 1 hypersensitivity reaction is **anaphylaxis** and death.

14. (True/False (T/F):)

   12. The "Whist and Flare" reaction is an example of a **Type I** Hypersensitivity reaction. **T**

   13. The histological findings in classic asthma include: thick basement membrane, increased infiltration of mast cells, submucosal glands, increased eosinophils, and muscle hyper trophy. **F**

   14. The clinical signs and symptoms of allergic rhinitis are due to immune complex deposition. **T**

   15. IgG is a key mediator in allergic rhinitis and hay fever. **T**

   16. Hemolytic anemia are often caused by complement-mediated destruction of red blood cells. **T**

   17. Serum sickness is a **Type I** hypersensitivity reaction, and involves mast cell degranulation **F**

   18. Polymorphonuclear cells are major effector cells in delayed hypersensitivity reactions. **T**
Bio 186: General Pathology  Quiz #3 (Carcinogenesis)  April 18, 2003  Name:  

Fill-in-the-blank questions:

1. The three types of cancer that, combined, account for ~50% of cancer deaths in men and women (in the U.S.) are:  
   [ ] colon/rectal  [ ] lung  [ ] breast/prostate  

2. Tumor "grading" measures the differentiation of a tumor.

3. Staging of a tumor refers to the [ ] size [ ] metastasis (degree of spread) of a tumor.

4. The term "anaplasia" refers to a tumor that is  undifferentiated  

5. Give three cellular characteristics of dysplasia:  
   [ ] [ ] [ ]  
   and  

6. Give an example of a proto-oncogene that is activated by point mutation:  
   [ ] ras  

7. Give an example of a proto-oncogene that is activated by a chromosomal translocation that results in over-expression of that oncogene:  
   [ ]  
   What two genes are involved?  
   [ ] [ ]  
   [ ]  
   What is the disease associated with this abnormality?  
   [ ]  

8. Give an example of a proto-oncogene that is activated by a chromosomal translocation that results in a new gene product (a tyrosine kinase):  
   [ ]  
   [ ]  
   What is the name of the fused gene product?  
   [ ]  
   [ ]  
   [ ]  
   What is the name of the chromosome that contains this (9;22) translocation?  
   [ ]  
   [ ]  
   [ ]  
   What is the disease associated with this abnormality?  
   [ ]  

9. Give an example of a proto-oncogene that is activated by gene amplification:  
   [ ]  

10. Name three tumor suppressor genes that we've studied:  
    [ ] p53  
    [ ] [ ]  
    and  
    [ ] [ ]