Autoimmune disorders

- Hypersensitivities
- Autoimmune disorders
- Immunodeficiency diseases

Poison Ivy
Hypersensitivity

- Immune response against a foreign antigen that is exaggerated beyond the norm.
- Four types

**Table 16-5**

<table>
<thead>
<tr>
<th>Types of Hypersensitivity Reactions</th>
<th>Immediate-type hypersensitivity reactions (occur from within a few minutes to 24 hours after contact with a particular antigen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I hypersensitivity reactions</td>
<td>Anaphylactic reactions (allergic reactions)</td>
</tr>
<tr>
<td>Type II hypersensitivity reactions</td>
<td>Cytotoxic reactions (involve damage to or death of body cells)</td>
</tr>
<tr>
<td>Type III hypersensitivity reactions</td>
<td>Immune complex reactions (damage to tissues and organs is initiated by antigen-antibody complexes)</td>
</tr>
</tbody>
</table>

**Delayed-type hypersensitivity (DTH) reactions (usually take 24 to 48 hours or longer to manifest themselves)**

| Type IV hypersensitivity reactions | Also known as cell-mediated reactions; antibodies play only a minor role, if any; an example is a positive TB skin test |
Type I

- Immediate hypersensitivity
- Sensitization
- Produce IgE antibodies
Allergens

Urticaria

• Localized reactions
Systemic

- Degranulation
- Massive Histamine release; rapid suffocation
- Contraction of bronchial smooth muscle; swelling of larynx due to fluid accumulation in tissue
- Need epinephrine: relax smooth muscle
- Anti-histamines, corticosteroids & bronchodilator
Diagnosis
Type II Cytotoxic Transfusion reactions
Rh and Hemolytic anemia
Type III- Immune complex-mediated

- Complement system activation
- Lungs & pneumonia from spores of fungi
- Kidney
- Blood
Type IV - Cell-mediated or delayed

- 12-24 hours to produce inflammation
- APC and T cells
- Tuberculin test
- Dermatitis
- Tissue graft rejection: use immunosuppressant drugs
Autoimmune

- Addisons (adrenal glands)
- Graves disease (Thyroid overproduction)
- Insulin dependent diabetes (attack pancreas, destroy cells)
- Multiple sclerosis (myelin sheath)
- Myasthenia gravis
- Rheumatoid arthritis (B cell antibodies against collagen)
- Systemic lupus (multiple organs, type III) antibodies against nucleic acids
<table>
<thead>
<tr>
<th>Disease</th>
<th>Defect</th>
<th>Manifestation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic granulomatous disease</td>
<td>Ineffective neutrophils</td>
<td>Uncontrolled infections</td>
</tr>
<tr>
<td>Severe combined immunodeficiency disease (SCID)</td>
<td>A lack of T cells and B cells</td>
<td>No resistance to any type of infection, leading to rapid death</td>
</tr>
<tr>
<td>Bruton-type agammaglobulinemia</td>
<td>A lack of B cells and thus a lack of immunoglobulins</td>
<td>Death from overwhelming bacterial infections</td>
</tr>
<tr>
<td>DiGeorge anomaly</td>
<td>A lack of T cells and thus no cell-mediated immunity</td>
<td>Death from overwhelming viral infections</td>
</tr>
</tbody>
</table>

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