1. Infections in Immunocompromised Hosts: Introduction Slide

Infections in Immunocompromised Hosts

David R. Snydman, M.D.

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2. Immune Defects and Commonly Associated Pathogens (1)

Immune Defects and Commonly Associated Pathogens

<table>
<thead>
<tr>
<th>Immune Defect</th>
<th>Pathogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrier breakdown</td>
<td></td>
</tr>
<tr>
<td>Burns</td>
<td>Pseudomonas aeruginosa, Staphylococcus aureus</td>
</tr>
<tr>
<td>Trauma</td>
<td>Streptococcus pyogenes, Staphylococcus epidermidis</td>
</tr>
<tr>
<td>Phagocytic function</td>
<td></td>
</tr>
<tr>
<td>Absolute decrease</td>
<td>Enteric Gram-negative bacteria, Pseudomonas aeruginosa,</td>
</tr>
<tr>
<td></td>
<td>Aspergillus spp., Candida spp.</td>
</tr>
<tr>
<td>Chemotaxis</td>
<td>Staphylococcus aureus, enteric Gram-negative bacteria</td>
</tr>
<tr>
<td>Microbial killing</td>
<td>Staphylococcus aureus, Burkholderia cepacia, Gram-negative</td>
</tr>
<tr>
<td></td>
<td>bacteria, Aspergillus spp.</td>
</tr>
</tbody>
</table>

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3. Immune Defects and Commonly Associated Pathogens (2)

<table>
<thead>
<tr>
<th>Immune Defect</th>
<th>Pathogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humoral immunity</td>
<td></td>
</tr>
<tr>
<td>Hypogammaglobulinaemia</td>
<td>Streptococcus pneumoniae, Haemophilus influenzae</td>
</tr>
<tr>
<td>IgA deficiency</td>
<td>Pyogenic bacteria, Giardia lambia.</td>
</tr>
<tr>
<td>Asplenia</td>
<td>Streptococcus pneumoniae, Haemophilus influenzae</td>
</tr>
<tr>
<td>Complement deficiency</td>
<td>Pyogenic bacteria, Neisseria spp.</td>
</tr>
<tr>
<td>Cell-mediated immunity</td>
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<tr>
<td></td>
<td>Intracellular bacteria (e.g. Listeria monocytogenes),</td>
</tr>
<tr>
<td></td>
<td>viruses (e.g. Herpes family), fungi (e.g. Candida spp., Cryptococcus spp.), parasites</td>
</tr>
<tr>
<td></td>
<td>(e.g. Toxoplasma gondii)</td>
</tr>
</tbody>
</table>

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4. Principles of Infection in Compromised Host (1)

Principles of Infection in Compromised Host

**Neutropenic Patient**

- Granulocyte count and fever association
- Infection presentation “different”
  - Abscess
  - Pulmonary Infiltrate
- Fever work up

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5. Principles of Infection in Compromised Host (2)

Principles of Infection in Compromised Host

- Etiology can be ANYTHING
- Sometimes more than one pathogen!
- Aggressive approach to diagnosis
  - CT Scan
  - BAL
  - Biopsy
- Presumptive Treatment

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6. Principles of Infection in Compromised Hosts (3)

Principles of Infection in Compromised Hosts

- Timing
- Type of immunosuppression
- Net state of immunosuppression
- Pathogen-pathogen interactions
- Type of transplant

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7. Epidemiologic Clues

Epidemiologic Clues

- Travel
- Endemic Exposures
- Nosocomial Problems
- Family Exposures
- Temporal Illness

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8. Relationship Between the Etiology of Infection and the Time...

Relationship Between the Etiology of Infection and the Time Since Hematopoietic Stem Cell Transplant

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9. Select Common Pathogens in Compromised Host

Select Common Pathogens in Compromised Host

- CMV
- Aspergillus
- Nocardia
- Pneumocystis carinii

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10. Cytomegalovirus

Cytomegalovirus

- Herpes Family
- Common
  Reactivation
  Primary Infection
Disease: Fever, hepatitis, colitis, retinitis, pneumonia
- Treatment
  Ganciclovir

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11. Aspergillus

Aspergillus

- Mold
- Nosocomial/Environmental
- Pneumonia - focal, halo sign
- Diagnostic Difficulty
- Silver stain: 45 degree, septae, filamentous, “fingers of death”
- Therapeutic Difficulty

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12. Pneumocystis carinii

Pneumocystis carinii

- Fungus (previously parasite!)
- Endogenous reactivation
- Pneumonia - Diffuse interstitial
- Dx: Methanamine silver stain, looks like small cups
- Prevention
- Treatment - TMP-SMX, Pentamidine

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13. Nocardia

Nocardia

- Gram variable branching rod
- Modified “acid fast”
- Treatment - TMP–SMX, Imipenem, Amikacin
- Cavitary pneumonia, brain abscess, skin

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