Stages of infectious diseases

Module 2
Dr Elutade
Stages of Infectious Diseases

• The 5 stages are:
  ✓ Incubation
  ✓ Prodromal
  ✓ Illness
  ✓ Decline
  ✓ Convalescence
Incubation Period

• Characteristics of this stage:

✔ Occurs after the initial entry of the pathogen into the host (patient)

✔ The pathogen begins multiplying in the host

✔ However, there are insufficient numbers of pathogen particles present to cause signs and symptoms of disease

✔ The patient is unaware that a disease is beginning to develop

✔ Some diseases, like influenza, have very short incubation periods, measured in days; others, like AIDS, have longer ones, sometimes extending for years.

✔ The incubation period for a given disease is determined by the inoculum size (infectious dose received), the virulence and life cycle of the pathogen (including the reproduction time), and the resistance of the host (strength of host’s immune system)

✔ For example, the intestinal disease shigellosis is quite contagious in humans because only 10 to 100 cells of a *Shigella* species need be ingested to establish an infection; in contrast, salmonellosis does not spread as easily because as many as $10^6$ cells of *Salmonella enterica* serotype
<table>
<thead>
<tr>
<th>Disease</th>
<th>Incubation Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staphylococcus</em> foodborne infection</td>
<td>&lt; 1 day</td>
</tr>
<tr>
<td>Influenza</td>
<td>About 1 day</td>
</tr>
<tr>
<td>Cholera</td>
<td>2 to 3 days</td>
</tr>
<tr>
<td>Genital herpes</td>
<td>About 5 days</td>
</tr>
<tr>
<td>Tetanus</td>
<td>5 to 15 days</td>
</tr>
<tr>
<td>Syphilis</td>
<td>10 to 21 days</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>70 to 100 days</td>
</tr>
<tr>
<td>AIDS</td>
<td>1 to &gt;8 years</td>
</tr>
<tr>
<td>Leprosy</td>
<td>10 to &gt;30 years</td>
</tr>
</tbody>
</table>
Prodromal Stage

• This stage:
  ✓ Occurs after the incubation period
  ✓ The pathogen continues to multiply and the host begins to experience the first general signs and symptoms of illness, which typically result from activation of the immune system, such as fever, pain, soreness, swelling, or inflammation
  ✓ Usually, such signs and symptoms are too general to indicate a particular disease; patients may feel like they are “coming down with something” but are not yet sure what it is
  ✓ Not all infectious diseases have a prodromal stage; some diseases have very specific prodromal symptoms, while other diseases have an imperceptible prodromal phase.
Illness Stage

- This stage:
  - Occurs after the prodromal period
  - The infectious agent multiplies at high levels, exhibits its greatest virulence, and becomes well established in its target tissue
  - Is the time the patient experiences the typical symptoms associated with that particular disease (e.g., sore throat, headache, sinus congestion)
  - Typically, the patient’s immune system has not yet fully responded to the pathogens, and their presence is harming the body.
  - Is usually when a physician first sees the patient
  - Communicable diseases are most easily transmitted during this period
  - The length of this period is extremely variable
Decline Period

• During this stage:
  ✓ The body gradually returns to normal as the patient’s immune response and/or medical treatment vanquish the pathogens
  ✓ Fever and other signs and symptoms subside; normally the immune response and its products (such as antibodies in the blood) peak during this stage.
  ✓ If the disease doesn’t decline, then the disease is fatal (the patient dies)
  ✓ However, during the decline period, patients may become susceptible to developing secondary infections because their immune systems have been weakened by the primary infection
Convalescence

- This stage:
  - Is the stage of recuperation and recovery from the disease
  - The patient generally returns to normal functions, although some diseases may inflict permanent damage that the body cannot fully repair
  - For example, brain damage may follow encephalitis or meningitis, paralysis may follow poliomyelitis, and deafness may follow ear infections
  - During this period, many patients stop taking their antibiotics, even though there are still pathogens in their system. This noncompliance means that bacteria with higher resistance are left behind to repopulate, putting the patient at risk for redevelopment of the infection that will not be treatable with the previously used antibiotic
  - The length of a convalescent period depends on the amount of damage, the nature of the pathogen, the site of infection, and the overall health of the patient.
Figure 1: Progress of Infectious Disease (Source: Courses.lumenlearning.com)
More about stages of infectious diseases

• A patient is likely to be infectious during every stage of disease.

✓ Even though infected persons are infective during the symptomatic periods, yet many people are unaware that infections can often be spread during incubation and convalescence stages

➢ This is especially true of diseases such as typhoid fever and cholera, in which the convalescing person carries the pathogenic microorganism for months or even years.

➢ Similarly, a patient who no longer has any obvious herpes sores is always capable of transmitting herpesviruses, and a convalescent carrier of *Salmonella* may excrete the bacterium for a year or more

• Good aseptic technique can limit the spread of many pathogens from recovering patients.