Factors Influencing Innate Immunity

Dr. Tola FARAJ/Lecturer

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\texttt{tola.faraj@tiu.edu.iq}

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Factors influencing innate immunity

- The factors that may influence innate immunity of the host include age and nutritional status of the host.

- **Age:** Extremes of age make an individual highly susceptible to various infections. This is explained in part by the immature immune system in very young children and declining immunity in older individuals.

- The fetus-in-utero is usually protected from maternal infections by the placental barrier. However, human immunodeficiency virus (HIV), rubella virus, cytomegalovirus, and Toxoplasma gondii cross the placental barrier and cause congenital infections.

- Very old people are susceptible to suffer more than young people from a disease (e.g., pneumonia) and have high mortality. This may be due to more active immune response in an adult causing greater tissue damage.
Factors influencing innate immunity

- **Nutritional status:**
  
  - Nutritional status of the host plays an important role in innate immunity. Immunities are lowered in malnutrition. Examples are:

  - Neutrophil activity is reduced, interferon (inhibiting virus replication) response is decreased, and C3 and factor B of the complement are decreased in malnutrition.

- **Malnutrition** is a condition that results from eating a diet which does not supply a healthy amount of one or more nutrients.
Deficiency of vitamin A (is important for normal vision, the immune system, and reproduction), vitamin C (helping to protect cells and keeping them healthy), and folic acid (Folic acid helps your body produce and maintain new cells, and also helps prevent changes to DNA that may lead to cancer.) makes an individual highly susceptible to infection by many microbial pathogens.
Mechanisms of innate immunity

**Innate immunity of the host performs two most important functions:**

- It kills invading microbes and it activates acquired (adaptive) immune processes.
- Innate immunity unlike adaptive immunity, however, does not have any memory and does not improve after re-exposure to the same microorganism.

- The innate immunity is primarily dependent on four types of defensive barriers:
  1. Anatomic barriers,
  2. Physiologic barriers,
  3. Phagocytosis, and
  4. Inflammatory responses.
1. **Anatomic barriers:**

- Anatomic barriers include **skin** and **mucous membrane**. They are the most important components of **innate immunity**. They act as **mechanical barriers** and **prevent entry of microorganisms** into the body.

- The **intact skin** prevents entry of microorganisms. For **example**, breaks in the skin due to scratches, or wounds, cause infection. **Bites** of insects harboring pathogenic organisms (e.g., mosquitoes, mites, ticks, fleas, and sandflies), introduce the pathogens into the body and transmit the infection.
Skin secretes **sebum** (an oily secretion of the sebaceous glands), which prevents growth of many microorganisms. The sebum consists of lactic acid and fatty acids that maintain the pH of skin between 3 and 5, and this pH inhibits the growth of most microorganisms.
Mucous membranes form a large part of outer covering of gastrointestinal, respiratory, genitourinary, and many other tracts of human host. A number of nonspecific defense mechanisms act to prevent entry of microorganisms through mucous membrane.
Thanks for your attention

✉ tola.faraj@tiu.edu.iq