

# Free research paper on adaptive immunity response

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## **Abstract**

The adaptive immune response comprises of antibody reactions and cell-mediated responses that are carried out by diverse lymphocyte cells; B cells, as well as, T cells, respectively. B Cells are the main cells involved in the formation of antibodies that flow in blood plasma and even the lymph fluids, where they bind specially to the alien antigens. Binding of antibody inactivates viruses and microbial toxins by blocking their ability to bind to receptors on host cells. Antibodies, also known as immunoglobulin, are big Y-shaped proteins that are typically comprised of two big heavy chains, as well as, two small lighter chains. In mammals there exists five categories of antibodies: IgA, IgE, IgD, IgG, and IgM, different in biological properties, every one has changed through time to handle different classes of antigens. In response to antigens, cell-mediated immunity are involved in activations of various cytokines, macrophages, natural killer cells (NK), antigen-specific cytotoxic T-lymphocytes.

## **Scenario 1: Acute Tonsillitis**

Epidemiology: Acute tonsillitis can last for 1-3 weeks and affects school children in most cases, but may also affect adults (Huether & McCance, 2012). The cause of acute tonsillitis can either be bacterial or viral.

Hemolytic streptococcus is the most common infecting organism. Others organisms that cause acute tonsillitis are staphylococci and pneumococci, which may directly infect the tonsil or may be secondary to viral infection.

## **Pathophysiology**

The factors that precipitate acute tonsillitis include age, sex, race, environment, and unhealthy environment. Factors that predispose humans to the infection are cold, loss of sleep, and constipation. Bacteria or virus enter the body through the mouth and the nose and are filtered in the tonsils. Tonsils respond by surrounding bacteria and virus with white blood cells.

The tonsils are 3 groups of tissue: the pharyngeal (adenoid) tonsil, the lingual tonsil, and facial tonsil or the palatine. The tonsils are lymphoid muscles covered by respiratory epithelium, that is invaginated and which effects crypts. In addition to generating lymphocytes, the tonsils are lively in the production of immunoglobulin. Because they are the first lymphoid aggregates in the aero digestive tract, the tonsils are understood to play a part in immunity.

## **Clinical Presentation**

The infection causes enlargement of tonsils with symptoms including sore throat, fever (100-104°F), dysphagia, constitutional symptoms, and loss of appetite. Signs include red and swollen tonsils, redness of throat, grey furry tongue, and tenderness on the lymph nodes.

## **Treatment may involve either antibiotic therapy or tonsillectomy.**

Scenario 2: Allergic Contact Dermatitis

Epidemiology: Dermatitis is the inflammatory reaction of the skin resulting from direct contact with an offending agent (Porth, 2012). It is an allergic,

hypersensitivity reaction resulting from contact with a substance that the immune system considers an allergen.

### Pathophysiology

The principal pathological feature of contact dermatitis is intercellular edema of the epidermis. Initial reaction involves the formation of epidermal vesicle and bullae in acute cases. In chronic cases, papules, lichenification, and scaling are formed. Haptens trigger Toll-like receptors (TLRs) and also activate inborn immunity. The significance of hapten-mediated stimulation of innate immunity is underscored by the clinical thought that the irritancy of compounds (i. e., the ability of these compounds to cause clearly visible skin irritation upon primary exposure) connects with their capacity to act as communication sensitizers and to prompt acute contact dermatitis.

Risk Factors: Industrial chemicals such as nickel, rubber, poison ivy, and preservatives used in certain cosmetic products are some of the common allergens. Contact dermatitis is a growing concern for industry workers comprising 90% of compensation claims for dermatologic conditions.

**Clinical Presentation: The allergic reaction produces eruptions, exudation, ulcer, fever, tearing muscle, and pain.**

Diagnosis: Simple in- vivo test is used; and not in- vitro test. Commonly used tests are patch test and prick test.

Management: Topical steroid cream is used to control inflammation. An antibiotic with steroid and oral anti-histamines are the other alternatives to treatment.

## **Scenario 3: Heart Palpitations**

### Pathophysiology

Palpitations are racing, fluttering, or skipping sensation of the heart (Robinson, 2007). Mechanisms that cause the sensation are unknown, but they reflect the changes in cardiac rhythm. It is the unusual movement in the heart that is perceived by the patient. The patient feels as if the heart is skipping rather than the usual heart beat mechanism. This is because the ventricular feeling is longer thus cause a higher stroke volume.

Clinical Presentation: Palpitations present differently in different patients. Some patients are sensitive to every premature ventricular beat while others are to a large extent unaware of the anomaly. Sensitivity is heightened in depressed, sedentary, and anxious patients. The effect is reduced for patients who are active and happy.

Indications of severity: Dyspnea, new onset of abnormally, abnormal heart beat, and heart rate above 120 beats per minute or below 45 beats per min while at rest. Other indications of seriousness include family history of sudden death, and a significant underlying heart disease.

### **Summary**

Adaptive immunity of the body refers to the immune response which an organism “learns” after getting challenged by antigens, as well as, pathogens. The body’s immune system reacts differently dependent on the nature of the encounter. There are principally two natures of immune reactions, humoral and cell mediated.

Humoral responses are aimed the elimination of exogenous antigens

whereas the cell mediated response is focused on the eradication of endogenous antigens

## References

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