Laryngeal Immunology
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An overview

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Abstract

Larynx technically speaking is situated at the cross roads between air passage and food passage. This situation adds to its vulnerability due to exposure to pathogens, allergens, pollutants and toxins. It is also exposed to stomach acid in patients with gastro oesophageal reflux. Current studies reveal that larynx is provided with unique immune system which could play an active / passive role in laryngeal protection. Animal studies reveal an abundance of lymphoid tissue in the mucosa of larynx and trachea. Various studies conducted with porcine larynx reveal that supraglottis contained fewer immunological cells when compared to other areas of larynx. This study of immunological profile of laryngeal tissue becomes more relevant because laryngeal transplantation is around the corner.

Laryngeal Immunology

Introduction:

Major function of larynx is considered to be protection of lower airway from the food passage. Histological studies of human and animal larynx reveal that it contains lymphoid tissue. These lymphoid tissue are present in the form of follicles and are termed as larynx associated lymphoid tissue (LAST). The quantum of these lymphoid follicles show variations according to age and site sampled.

Studies reveal that the presence of dendritic cells (antigen presenting cells) undergoes increase in response to airway infections. Currently the study of laryngeal immunology plays an important role in determining prognosis and outcome of infections and neoplasms involving laryngeal tissue. Squamous cell carcinoma is the most common malignancy in the supraglottic and glottic area. This has been attributed to the presence of fewer dendritic cells in that area. These dendritic cells plays an important role in presenting the antigen to the immune system thereby stimulating it. Histopathological studies reveal presence of large amounts of dendritic cells in the specimen studied indicate improved prognosis.

Pertaining to the field of laryngeal transplant “the success of transplant is dependent on the immunogenicity of the organ”. This is in turn a function of the presence of dendritic cells. One successful laryngeal transplantation has been described in literature.

Discussion:

Studies have conclusively revealed that laryngeal mucosa contains the requisite machinery for antigen recognition and T cell activation. This goes to prove that larynx is an immunologically active organ. Anatomically lymphatic drainage of larynx is highly complex due to its varying embryological origin. Simply stated the antigen presenting dendritic cells of laryngeal mucosa are capable of transporting antigen to the deep cervical group of lymph nodes.
The antigen presenting dendritic cells are also capable of delivering co-stimulatory signal which are required for T cell immunogenic activation. Two signal hypothesis proposed by Cohn and Bretscher still holds good in the process of activation of the immune system. The two signal hypothesis suggests that in addition to the delivery of antigen / Major Histocompatibility Complex mediated signals to the lymphocyte there should also be another signal provided by the antigen presenting cell. This second signal specifies whether the immune system should be activated or not. The art of making the transplanted tissue survive depends on blocking this activation process by the second signal.

References


