Host immune response to respiratory syncytial virus infection in children

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Abstract

Respiratory syncytial virus (RSV) is one of the leading causes of severe respiratory diseases in children, especially in infants. RSV infections result in an estimated $80 billion each year in economic losses globally. The immune responses induced by RSV infection are a fairly complex process that can contribute significantly to disease severity. Despite decades of research on RSV, many immune mechanisms remain to be explored. Despite substantial progress in vaccine development and the development of monoclonal antibodies over the years, there are still not enough effective preventive and therapeutic strategies. Recently, Pfizer developed a pre-fusion F subunit vaccine for preventing RSV infection in infants, the only vaccine currently approved by the FDA. This review focuses on how the immune system reacts when children contract the respiratory syncytial virus. We described the biological characteristics of RSV, the pathological process of RSV infection, innate immunity (including Pattern Recognition Receptors and inflammatory cells), adaptive immunity (including CD4+ and CD8+ T cells and Humoral Immune Response), and immune evasion. Understanding the complicated immune response to RSV infection is essential for developing effective interventions and vaccine developments. This review will enable an appreciation of how RSV affects the immune system and enhance the advancement of pragmatic therapeutic methodologies.

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