RSV and parainfluenza virus: a threat throughout life

Respiratory syncytial virus (RSV) and parainfluenza virus cause a considerable burden of disease throughout life, as well as being the leading causes of hospitalisation for respiratory tract illness in young children, says Dr Caroline Hall from the University of Rochester School of Medicine and Dentistry, New York, US.

Naturally acquired immunity to these infections is neither complete nor durable and this has hampered the development of effective vaccines. Moreover, controlling reinfections in older and immunocompromised individuals may require different strategies from those used in infants. Immunisation of high-risk individuals, aimed at preventing severe disease rather than preventing infection, appears to represent the most viable strategy. A number of attenuated RSV and parainfluenza virus vaccines are under development. Live-attenuated vaccines have the potential to be administered intranasally and to induce both systemic and mucosal immunity.

Another approach to prophylaxis in individuals at high risk is to augment levels of neutralising antibody to the F and G proteins by administration of immune globulin or monoclonal antibody. Although this strategy has prevented lower respiratory tract infections in animal studies, the main effect in humans has been to diminish the severity of illness. Monthly administration of RSV hyperimmune globulin or monoclonal antibody against F protein (palivizumab) to premature infants or infants with chronic lung disease significantly decreased the risk of subsequent hospitalisation.

At present, aerosolised ribavirin is the only treatment available for RSV infection. Although it has been shown to improve oxygenation and clinical scores and to decrease levels of secretory mediators of inflammation, a beneficial effect on clinical outcome is yet to be demonstrated. Moreover, it is relatively expensive and its use has therefore been limited. Ribavirin has also been evaluated for treatment and prophylaxis of RSV and parainfluenza virus infections in immunocompromised patients. Novel antiviral drugs under development include synthetic peptides of active regions of RSV and parainfluenza virus type 3 fusion proteins.

IV and inhaled human immunoglobulin, RSV hyperimmune globulin and monoclonal antibody have been studied for treatment of RSV infection, but to date the therapeutic benefit has generally been marginal. There is some evidence to suggest that in immunocompromised patients, RSV hyperimmune globulin or monoclonal antibody have some therapeutic and prophylactic efficacy that may be enhanced by coadministration of ribavirin.

Hall CB. Respiratory syncytial virus and parainfluenza virus. New England Journal of Medicine 344: 1917-1928, 21 Jun 2001

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