cases, so it was not possible to distinguish between genetic influences on the overall susceptibility and genetic influence on varying phenotypes as has been suggested by others.10 11

Our results support the notion of sarcoidosis as a complex disease triggered by a combination of environmental and genetic risk factors. To get further insight into the interactions causing the disease, specific genetic, environmental and infectious risk factors need to be investigated.

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REFERENCES


Lung alert

Mechanism of secondary bacterial infection following viral pulmonary infection (the viral-bacterial synergy)

This paper examines the mechanism causing secondary bacterial infection which often occurs after pulmonary viral infection. C57BL/6 mice were infected intranasally with influenza virus strain A/PR8/34(H1N1). By day 12 there was immune-mediated viral clearance; however, the mice showed a high susceptibility to pneumococcal infection during this recovery stage.

Normal initial bacterial clearance requires innate immunity with bacterial phagocytosis by resident alveolar macrophages. The phagocytic activity of CD11c+ alveolar macrophages in bronchoalveolar lavage fluid was lower in virus-infected mice than in virus-naïve mice. To determine the influence of interferon γ (IFNγ), the naïve mice were inoculated with exogenous IFNγ which inhibited alveolar macrophage-mediated phagocytosis of pneumococci both in vitro and in vivo. There was also suppressed surface expression of the class A scavenger receptor MARCO which is responsible for phagocytosis of pneumococci by alveolar macrophages. Thirdly, IFNγ increased the surface expression of MHC class II antigen. Thus, IFNγ inhibits bacterial phagocytosis and suppresses innate defence against pneumococcal infection. In vivo treatment with the IFNγ-specific antibody XMG1.2 had little effect on the course of viral infection but prevented increased susceptibility to pneumococcal infection by improved macrophage expression of inflammatory cytokines and preventing pre-regulation of MHC class II expression.

This study focuses on the early stages of pneumococcal infection and the crucial role of alveolar macrophages, the mechanisms of the synergy between influenza virus and Streptococcus pneumoniae and the inhibitory action of IFNγ. There might also be a future therapeutic approach of IFNγ neutralising antibodies for preventing secondary bacterial infections.

▶ Sun K, Metzger D W. Inhibition of pulmonary antibacterial defense by interferon-γ during recovery from influenza infection. Nat Med 2008;14:558–64

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