Hypoxia attenuates anti-*Aspergillus fumigatus* immune responses initiated by human dendritic cells.

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Details

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Abstract

Aspergillus fumigatus is an opportunistic mould that causes invasive pulmonary aspergillosis (IPA), a life-threatening infection in immunocompromised patients. During the course of IPA, localised areas of tissue hypoxia occur. Bacterial infection models revealed that hypoxic microenvironments modulate the function of host immune cells. However, the influence of hypoxia on anti-fungal immunity has been largely unknown. We evaluated the impact of hypoxia on the human anti-A. fumigatus immune response. Human monocyte-derived dendritic cells (DCs) were stimulated in vitro with germ tubes of A. fumigatus under normoxia or hypoxia (1% O2), followed by analysis of DC viability, maturation and cytokine release. While DC viability was unaffected, hypoxia attenuated cytokine release from DCs and maturation of DCs upon stimulation with A. fumigatus. These data suggest that hypoxia at the site of A. fumigatus infection inhibits full activation and function of human DCs. Thereby, this study identified hypoxia as a crucial immune-modulating factor in the human anti-fungal immune response that might influence the course and outcome of IPA in immunocompromised patients.

Involved units

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