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Abstract (oral session)

Legionella longbeachae respiratory infection in neutrophil-depleted mice

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Objectives: Neutrophil infiltration is known to play a crucial role in protecting lungs from respiratory pathogens, including Legionella. Legionella longbeachae infections in humans are primarily prevalent in Australia, but there is a global increase in reported cases over the past decades. In comparison to other Legionella, L. longbeachae has an unusually high lethality in mice and causes focal bronchopneumonia, with massive recruitment of inflammatory cells in the lungs. Our goal was to investigate the role of neutrophils in respiratory infection with L. longbeachae. To this extent mice were treated with anti-Gr-1 monoclonal antibody (mAb) before and after infection and survival, bacterial loads, pathology and leukocyte content of the lung was analyzed and compared with untreated animals. Methods: Control C57Bl/6 mice (6 to 8 weeks old) were inoculated intratracheally with a sublethal dose of 10^3 L. longbeachae NSW150. At various time points after inoculation, mice were sacrificed and leukocytes were isolated from the lungs. Myeloid cells were stained for FACS analysis. Mice were injected either with 25 ug/dose or 250 ug/dose anti-Gr-1 18 hours before and 24 hours after infection. For the survival assay mice were observed for 14 days post-infection. For enumeration of bacterial load at different time points CFU in lungs and liver was determined. Histological sections of lungs were prepared and stained with hemotoxylin and eosin. Statistical significance was assessed using two-way analysis of variance or a Student's t test in GraphPad Prism software. Results: The flow cytometry analysis revealed predominance of CD11b⁺/Gr-1⁺ neutrophils in the first 48 hours post-infection. Anti-Gr-1 mAb treated mice showed increased susceptibility to infection, as well as higher bacterial burdens and more severe histopatologic changes in lungs compared to non-treated infected mice. The observed effects were less severe in low-dose anti-Gr-1 Ab treated mice then in high-dose treated mice. Conclusion: In neutrophil-depleted mice L. longbeachae causes more severe infection and neutrophils play an important role in host resistance against this bacterium.