(1) Submission ID#1539739

Characterizing the Immune Kinetics driving Neisseria gonorrhoeae-induced Pelvic Inflammatory Disease in Female Mice

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Background

Ngo infections in women are a significant public health concern as they are often asymptomatic and the lack of treatment can lead to the spread of Ngo from the lower genital tract to the upper genital tract (UGT) in 10-25% of cases. While the recruitment of neutrophils to the site of infection is a hallmark of symptomatic gonorrhea, the mechanisms driving the overexuberant neutrophilic response to Ngo infection remains poorly understood. Our work focuses on characterizing the proinflammatory immune kinetics in the UGT following Ngo infection, with the aim of identifying novel drug targets and host-focused therapeutic interventions to prevent the sequelae associated with pelvic inflammatory disease (PID) in women.

Aim/Methods

Using a transcervical infection model in female mice, we established uterine infection and characterized the immune kinetics using a combination of immunofluorescence microscopy, ELISAs, and flow cytometry. Our research aims to characterize the effector cells that drive inflammation and to target this response to suppress the Ngo-driven immunopathogenesis.

Results

We have established the temporal immune kinetics following Ngo inoculation in the UGT, including cytokine expression and neutrophil recruitment to the UGT, and characterized the effect of neutrophil depletion on the gonococcal burden. Furthermore, our work aims to define gonococcal specific immune responses by comparing the immune kinetics in the UGT following infection with several other bacteria (not associated with

PID). Our preliminary findings suggest that Ngo induces a more robust inflammatory response in comparison to other inoculums.

Conclusions

The recruitment of neutrophils to the site of infection is hallmark of symptomatic gonorrhea and thought to be a driving force of the immunopathology caused by an overexuberant response to Ngo infection. Our findings provide insights into the pathogenesis of gonococcal infection and suggest novel approaches to develop host-focused therapeutic interventions to improve the outcome of PID in women.