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1553

Mast cell activation in severe dengue

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Background: Mast cells have been shown to play a role in the pathogenesis of dengue, in mouse models. In our previous studies, we found that platelet activating factor (PAF), which is a mast cell product, played an important role in vascular leak. Therefore, we set to investigate the potential role of mast cell activation in the pathogenesis of dengue virus infection.
Methods: Serial twice daily blood samples were obtained from 38 adult patients with acute dengue from the time of admission to discharge. Mast cell tryptase level; viral loads, secretory phospholipase (sPLA2) activity and platelet activating factor (PAF) levels were assessed. All clinical and laboratory features were serially recorded until discharge of the patients. Disease severity was classified based on the WHO 2011 dengue guidelines.
Results: sPLA2 activity, mast cell tryptase level, and PAF levels were significantly elevated during the critical period in patients with severe dengue (SD) infection compared to non severe dengue infection (NSD). The highest sPLA2 activity, tryptase and PAF levels were seen on day 6 of illness, which co-incided with the critical phase. Mast cell tryptase ($p=0.006$), PAF levels ($p=0.01$) and sPLA2 activity ($p=0.01$) were significantly higher in those with SD when compared to NSD during the critical phase.
Conclusion: mast cell tryptase level, secretory phospholipase (sPLA2) activity, and platelet activating factor (PAF) levels were significantly higher in SD indicating mast cell activation which is likely to play a role in the pathogenesis of vascular leak in severe dengue.

1857

Transcriptional regulation in immune and epithelial cell types during influenza A infection

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In humans, infection with seasonal influenza A virus (IAV) is generally restricted to the respiratory tract. The lower airways are comprised of parenchymal cells such as airway epithelial cells (AEC) and haematopoietic cell populations such as airway macrophages (MΦ) and dendritic cells (DC). Infection of AECs by seasonal IAV results in productive virus replication whereas the infection of MΦ and DC results in abortive virus replication.
Recent studies have identified antiviral host cell factors that limit intracellular replication of a range of viruses, including IAV, in epithelial cells. We previously showed that certain antiviral factors were differentially expressed in mouse MΦ and AEC following *in vitro* infection with IAV, consistent with the hypothesis that one or more differentially expressed genes may restrict productive IAV replication in MΦ/DC. However, they do not give a complete picture of the particular genes which show elevated expression at basal levels or after IAV infection in MΦ/DC.
To address this, we examined the cell intrinsic responses systemically in AEC, MΦ and DC ex vivo, as they form the initial epithelial-immune barrier and are the first cells to encounter and respond during IAV infection. Here we show that the differential transcription networks in epithelial and immune cell types correlate with different viral outcomes.

