INVESTIGATION OF INFECTION-INDUCED STEROID-RESISTANT ASTHMA

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Neutrophilic asthma (NA) has been associated with increased bacterial colonisation of the airways and increased expression of innate immune factors in the lung. This suggests that infection may play an important role in the pathogenesis of NA. NA is an important health issue as sufferers are resistant to steroid treatment, which is the mainstay of asthma therapy and effective therapies are urgently required. Using mouse models of *Chlamydia* and *Haemophilus influenzae* lung infection and ovalbumin (Ova)-induced allergic airway disease (AAD) we have shown how infection may be linked to NA. Both infections suppressed eosinophilic inflammation and T-helper (Th) type 2 responses but increase neutrophilic inflammation and innate and Th1 and/or Th17 responses in AAD.

In the current study, the effectiveness of steroid treatment for the suppression of infection-induced neutrophilic AAD was assessed by treating infected, Ova-sensitised mice intranasally with dexamethasone during Ova challenge. Whilst dexamethasone treatment suppressed Th2-mediated, eosinophilic AAD in un-infected, Ova-sensitised groups, *Chlamydia* and *Haemophilus*-induced neutrophilic AAD were shown to be steroid-resistant.

Our findings correlate with clinical observations which show associations between infection, neutrophilic inflammation and steroid-resistance in asthmatics. These models will be utilised to examine the effectiveness of a number of novel therapies for infection-induced neutrophilic AAD and to develop improved treatment strategies for steroid-resistant asthma.

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Conflict of interest No