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Presenting Author Category

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Research Category

Basic Science

Abstract Title

Investigating The Protective Effects of Interferon Lambda Treatment for the Prevention of Virus-Induced Asthma

Background

Globally, an estimated 300 million persons are asthmatic, including 5 million children, and it is responsible for over 400,000 deaths annually. Respiratory syncytial virus (RSV) is the leading cause of hospitalization due to bronchiolitis and viral pneumonia in children under the age of 2 years. It is responsible for an estimated 200,000 deaths yearly worldwide. Early-life RSV infection has been correlated with airway remodeling that underpins asthma development later in life. The risk for severe RSV infection and asthma development is significantly higher in males than in females. Type III interferons (IFN- λ) are induced early in the lungs after virus infection, and they confer protection with less inflammatory effects and can regulate immune responses critical for asthma pathogenesis. Whether biological sex impacts early-life IFN- λ treatment during RSV infection against predisposition for subsequent asthma development is yet to be demonstrated.

Objective

To evaluate the sex-associated protective effects of single and multiple doses of early-life treatment with intranasal IFN- λ against RSV-induced asthma.

Methods

In vivo experimental study. Seven-day-old BALB/c mice will be infected intranasally with RSV-A2. Four hours post-infection, mice will receive single or multiple intranasal doses of IFN- λ 3. Four weeks post-infection, mice will be sensitized/challenged intranasally for 2 weeks with HDM extract. Twenty-four hours after the last HDM challenge, airway hyperresponsiveness will be measured using flexiVent. Supernatant from bronchoalveolar lavage (BAL) will be used for the analysis of antiviral and proinflammatory cytokines. Immune cells in both the BAL and lung tissue will be analyzed using flow cytometry. Viral clearance will be assessed through plaque assay. H&E and PAS staining of lung tissue will assess inflammation and mucus secretion. Data will be analysed using GraphPad Prism

Results

Interferon lambda suppressed airway infiltration

Conclusion

IFN- λ treatment mitigates airway inflammation and mucus secretion, offering a potential strategy to modulate asthma exacerbation

Authors

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