

ABSTRACT SUBMISSION FORM

LET'S TALK ABOUT

SEX + GENDER

Exploring the role of sex and gender on health research



CHR D 2020: Abstract Submission Form

Submitter Name

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Title

Sex-related differences in allergen-induced airway inflammation in a murine model

Background

Biological sex profoundly impacts disease prevalence and severity in asthma, higher in males before puberty, and in contrast higher in adult females compared to males. Despite the sex-bias in the disease process, sex as a biological variable is largely neglected in preclinical studies using animal models. We hypothesized that airway inflammation will be more pronounced in females compared to males, in the allergen house dust mite (HDM)-challenged murine model of airway inflammation.

Objective

To examine HDM-induced inflammatory changes in the bronchoalveolar lavage fluid (BALF) and lung tissue lysates.

Methods

Female and male mice BALB/c mice were challenged (intranasally) with HDM (0.7 µg/ml saline), X5 challenge per week for 2 weeks (N=10 per group). Leukocyte composition was assessed in BALF by modified Wright-Giemsa stain, abundance of a panel of 29 cytokines in BALF and lung tissue homogenates was measured by MesoScale Discovery platform, and levels of IgE antibodies (total and HDM-specific) in serum by ELISA. Sex-disaggregated data analysis was used for all outcomes in HDM-challenged mice after normalization with allergen-naïve mice.

Results

Cellular composition of BALF showed sex-related differences, with neutrophils and macrophages approximately ~2-fold ($p < 0.05$) higher in females compared to males, in response to HDM. Serum HDM-specific IgE titers were ~2-fold greater in females compared to male mice. Sex-dependent differences were also observed in the cytokine profile of BALF and lung tissue lysates; IL-17, IL-30, IL-9, MIP-3 were between 2 to 16-fold higher in females compared to males, whereas IL-25, IP-10, MCP-1, MIP-1, TNF and

IL-21 were >2-fold higher in males compared to females, in response to HDM.

Conclusion

This study details sex-related differences in HDM-mediated airway inflammation, in a preclinical murine model of asthma. The results of this study provide compelling evidence to include sex as a biological variable in preclinical animal models of airway inflammation.

Theme:

Basic Science

Do you have a table/figure to upload?

No

Are you willing to participate in Goodbear's Den?

Yes

Presenter Status:

Masters Student

What was your role in the project?

Perform Experiments

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