



Effects of Broccoli Sprout Extract Containing High levels of Antioxidant on Allergic Rhinitis

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Objective

Patients in congested cities may be more prone to suffer from allergies, due to the effect of pollution in allergic disorders. Our study determined if patients with allergic rhinitis could benefit from broccoli sprout extract (BSE) supplementation.

Methods

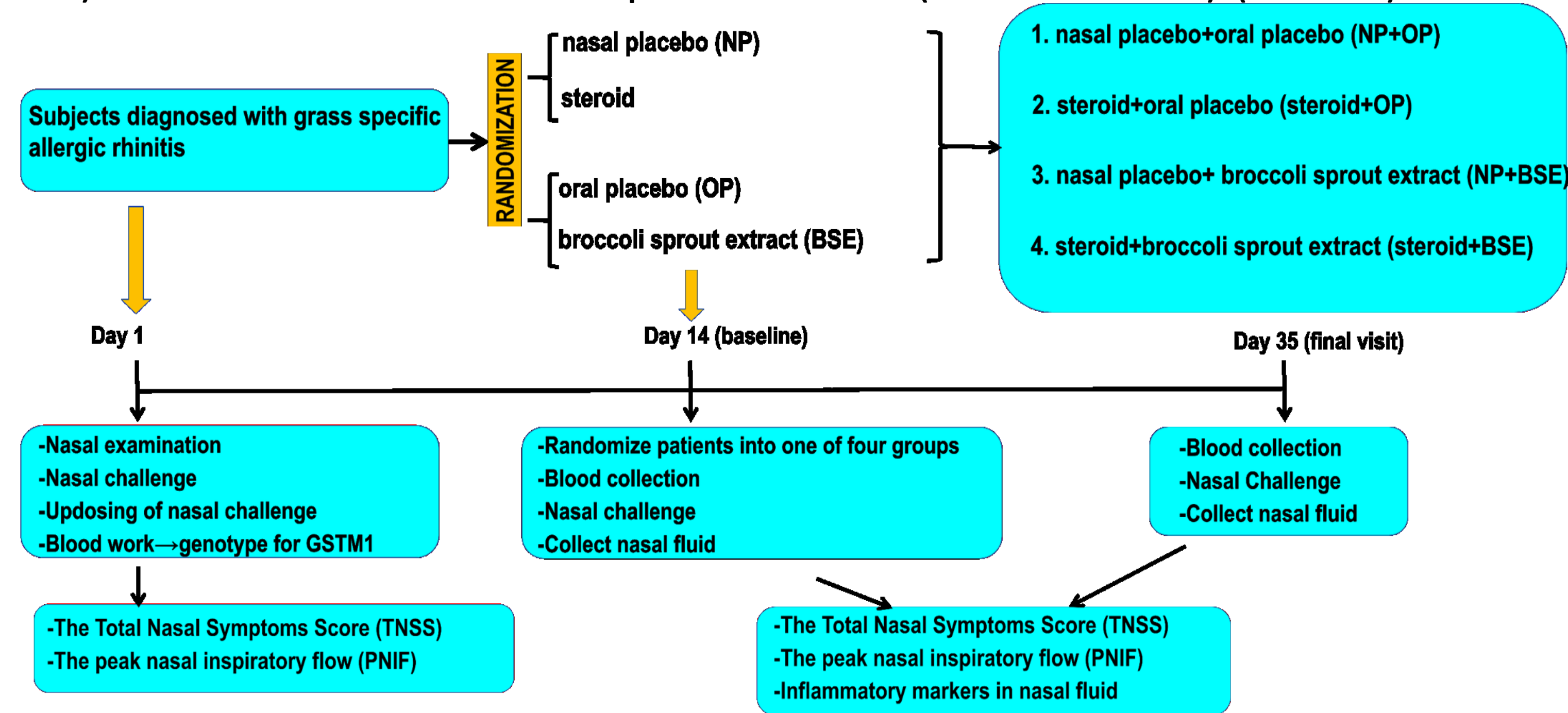
- A grass allergen challenge was performed before and after the intervention and nasal fluid collected with a sponge at 0, 5, 15, 30, 60, 120, 180, and 240 min.
- Total nasal symptoms score (TNSS) and peak nasal inspiratory flow (PNIF) were recorded at same time points.
- Cytokines by multiplex ELISA cytokine panel were collected at the same time points.

Study Design

A randomized, double-blind, placebo-controlled trial was performed.

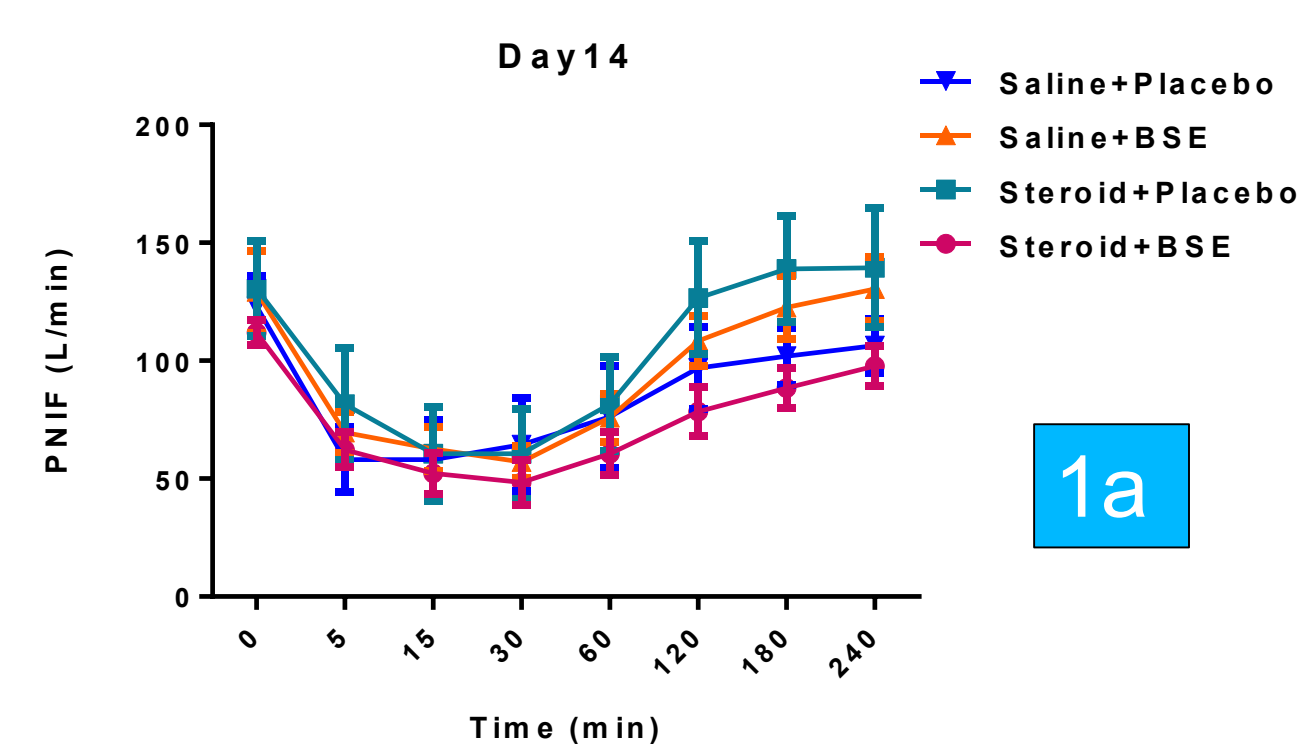
Forty seven participants were randomized to four groups:

- 1) nasal placebo + oral placebo (NP + OP) (N = 8)
- 2) nasal steroid + oral placebo (steroid + OP) (N = 9)
- 3) nasal placebo + broccoli sprout extract (NP + BSE) (N = 12)
- 4) nasal steroid + broccoli sprout extract (steroid + BSE) (N = 16)

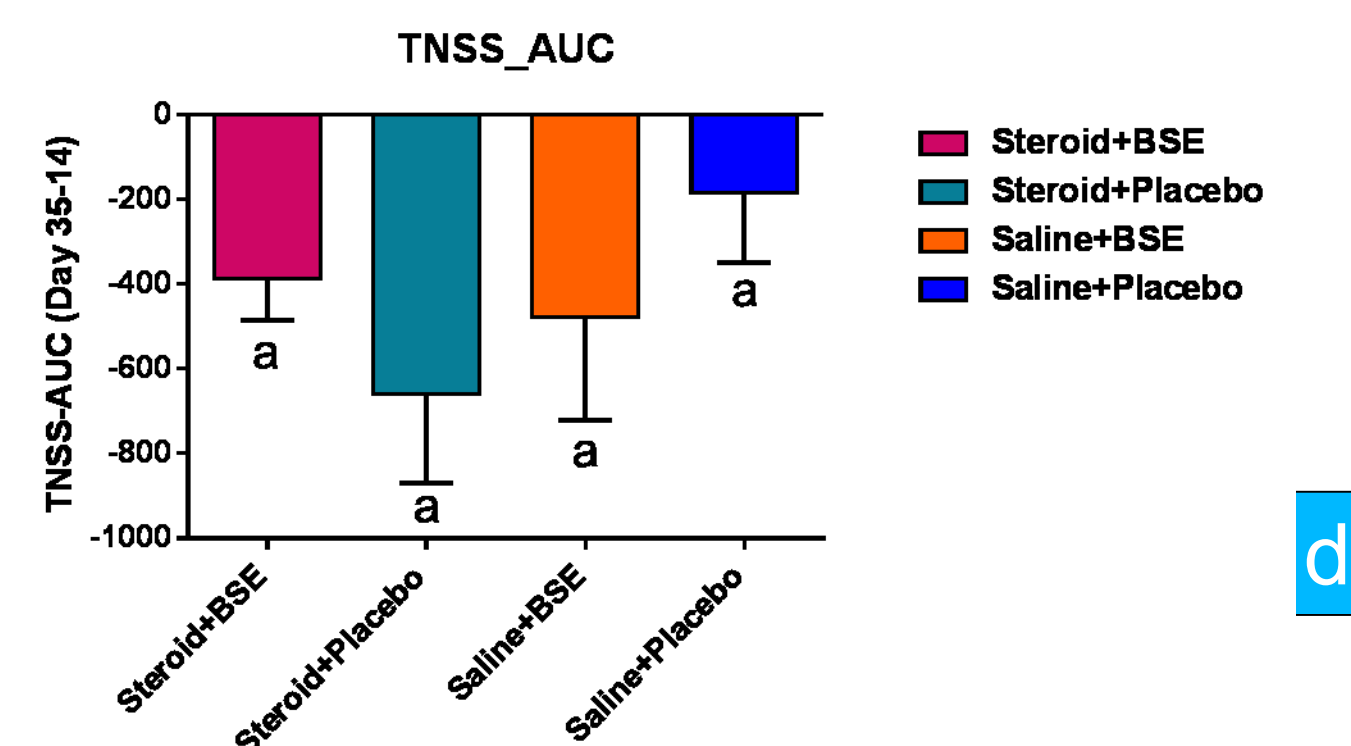
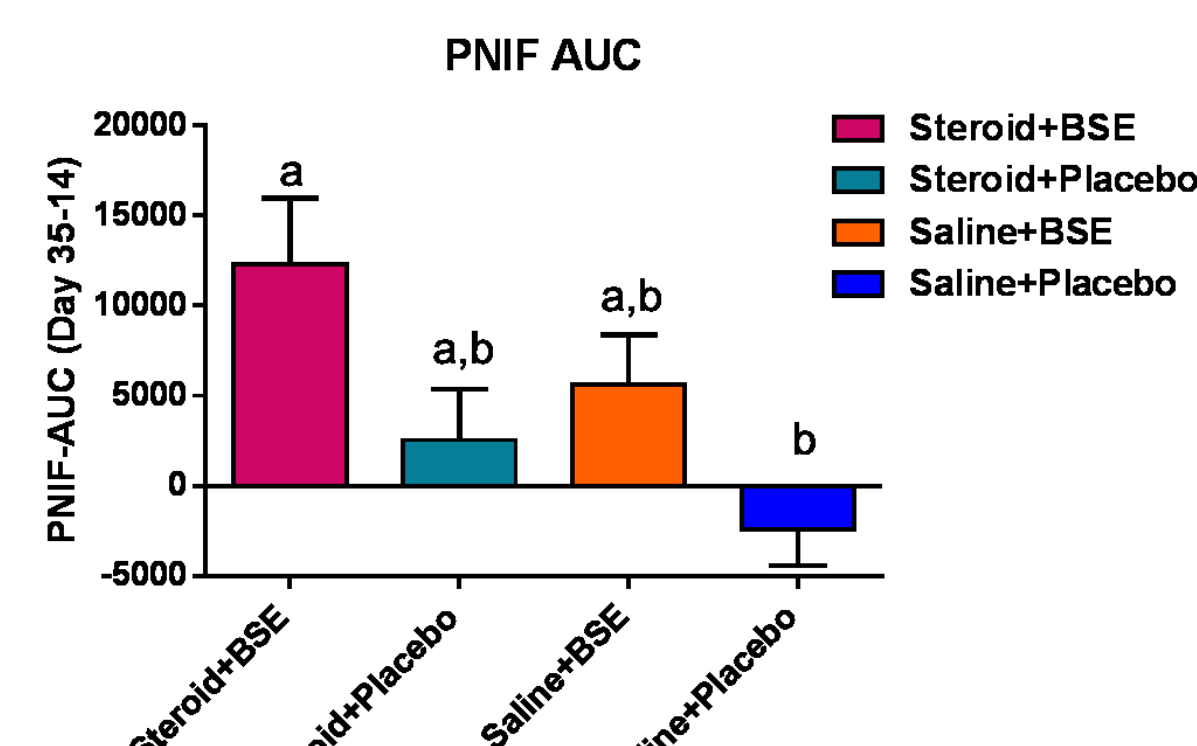
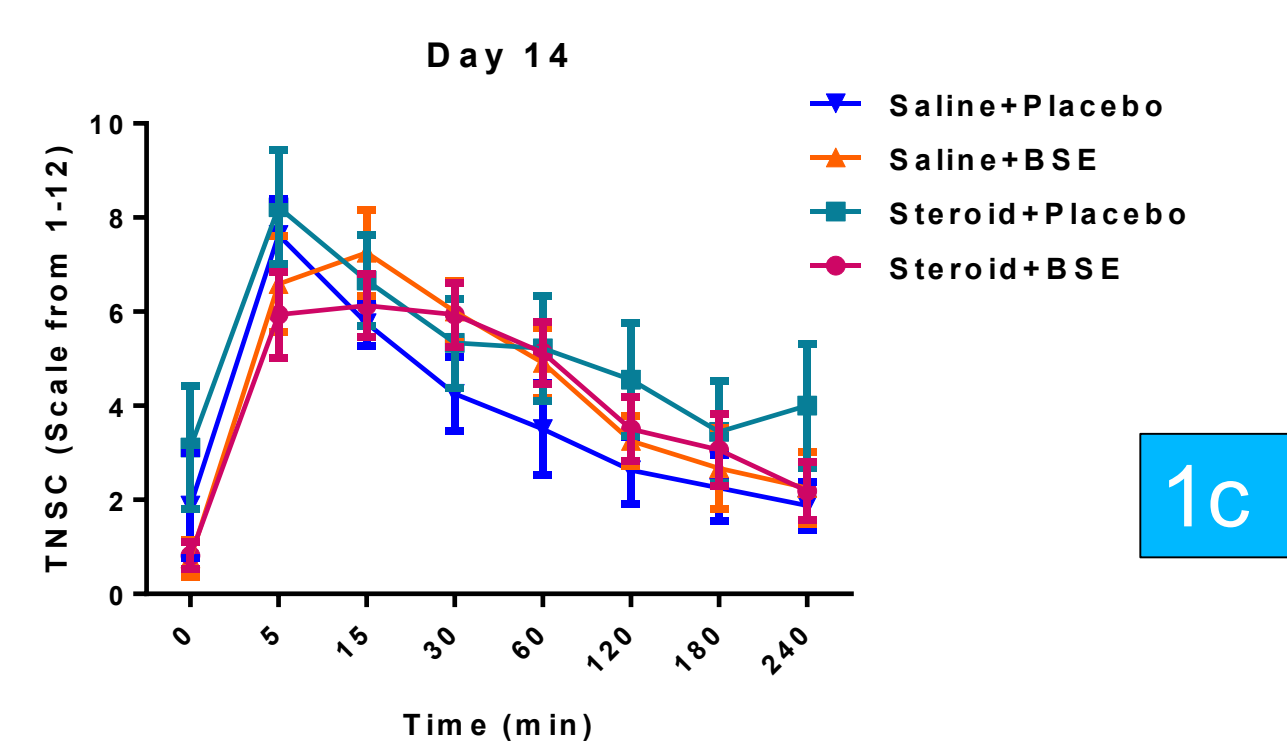


Results

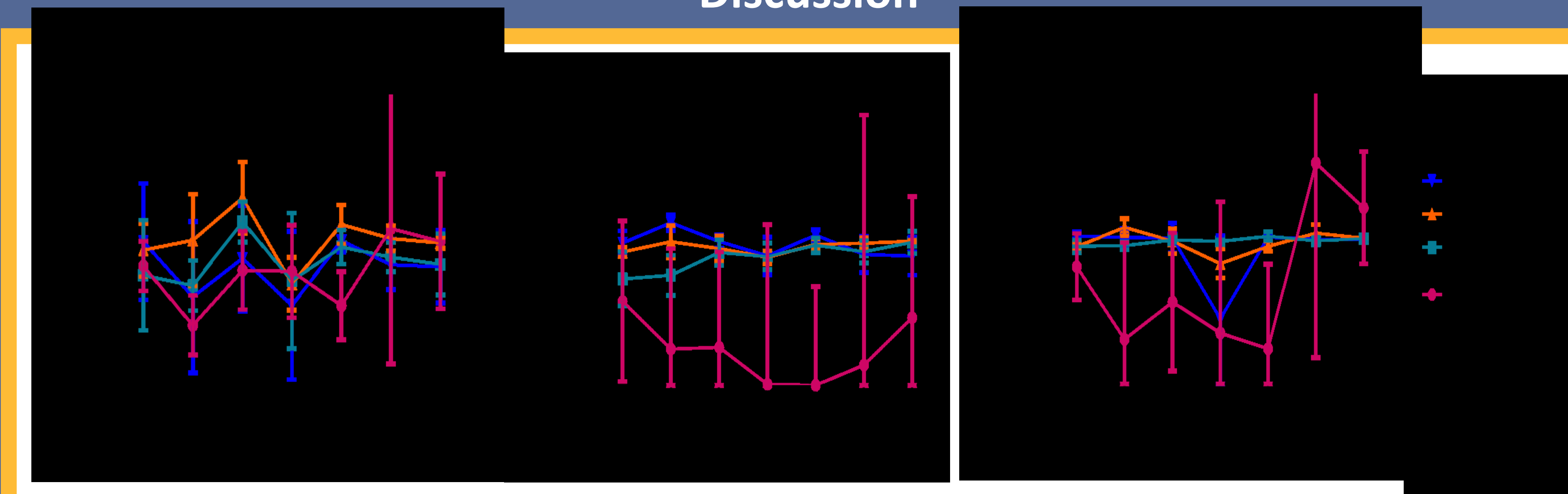
Peak Nasal Inspiratory Flow



Total Nasal Symptoms Score



Discussion



The mean difference between cytokine levels contained in mucus before and following the intervention was calculated for various time points following nasal allergen challenge (see figure 2 above), with the assumption that low mean differences were consistent with overall diminished cytokine levels following intervention. Although mean differences in T2 cytokines (IL-4, IL-5, IL-13) at various time points after challenge were lower for the steroid +BSE group compared to the nasal saline + placebo tablet, there was no statistical significance (P>0.05). No differences in IL-1b, IL-6, or IL-8 was seen among the 4 groups.

Summary

- PNIF (area under the curve, AUC) increased in NP + BSE, steroid + OP, and steroid + BSE groups, with statistical significance in steroid + BSE group.
- TNSS (AUC) decreased in the NP + BSE, steroid + OP and steroid + BSE groups, but did not reach significance.
- Steroid + BSE treatment decreased T2 cytokines at various time points compared to NP + OP or steroid + OP though was not statistically significant.

Conclusion

Daily BSE consumption in combination with daily nasal steroid application for 3 weeks further improved PNIF after grass allergen challenge compared to nasal steroid alone.

There appeared to be clinical significance during various time points when comparing the intervention groups to placebo. Following the intervention, when comparing to placebo:

- PNIF showed statistical significance at 5 (p = 0.03), 15 (p = 0.02), 60 (p = 0.01), 180 (p = 0.04), and 240 (p = 0.04) minutes following nasal challenge in group 1, and statistical significance at 60 minutes in group 2 (p = 0.02) and 3 (p = 0.01)(figure 1a). The area under the curve was significant when comparing group 1 with group 4 (p = 0.013)(figure 1b).
- TNSS, when comparing group 1 vs. 4, there appears to be statistical significance at 5 (p = 0.03), 15 (p = 0.057, and 30 (p = 0.05) minutes following nasal challenge(figure 1c). When compared to the nasal saline/placebo BSE, TNSS scores among the 3 active groups improved following the 3 week intervention though the are under the curve was not significant.