

Self-Reported Symptoms of Grass Allergic Subjects Correlate Positively with Symptom Scores Recorded In a Controlled Environment

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Introduction

The Environmental Exposure Chamber (EEC) model mimics naturalistic airborne allergen exposure that patients would encounter in their everyday lives. It allows for the exposure of subjects to a steady and consistent levels of allergen in a controlled temperature and humidity environment for repeated exposure days, allowing for reproducibility of data over successive studies. (1 & 2)

The aim of this study was to examine the correlation between Total Symptom Scores (TSS) recorded by grass-allergic subjects in the field and their TSS evoked by allergen exposure in the EEC.

Methods

- A total of 149 subjects were screened for grass allergy using skin prick test and serum IgE.
- Eligible subjects were exposed to airborne grass pollen in the EEC for 3-hours, and recorded their TSS every 30 minutes.
- The same subjects reported their TSS once daily at-home prior to peak pollen day, their perception of pollen exposure, and their estimated time spent outdoors using an e-diary (ePDAT™).
- Correlation analyses using Pearson coefficient was performed to investigate the relationship between data recorded in the EEC and data gathered in the field diaries.

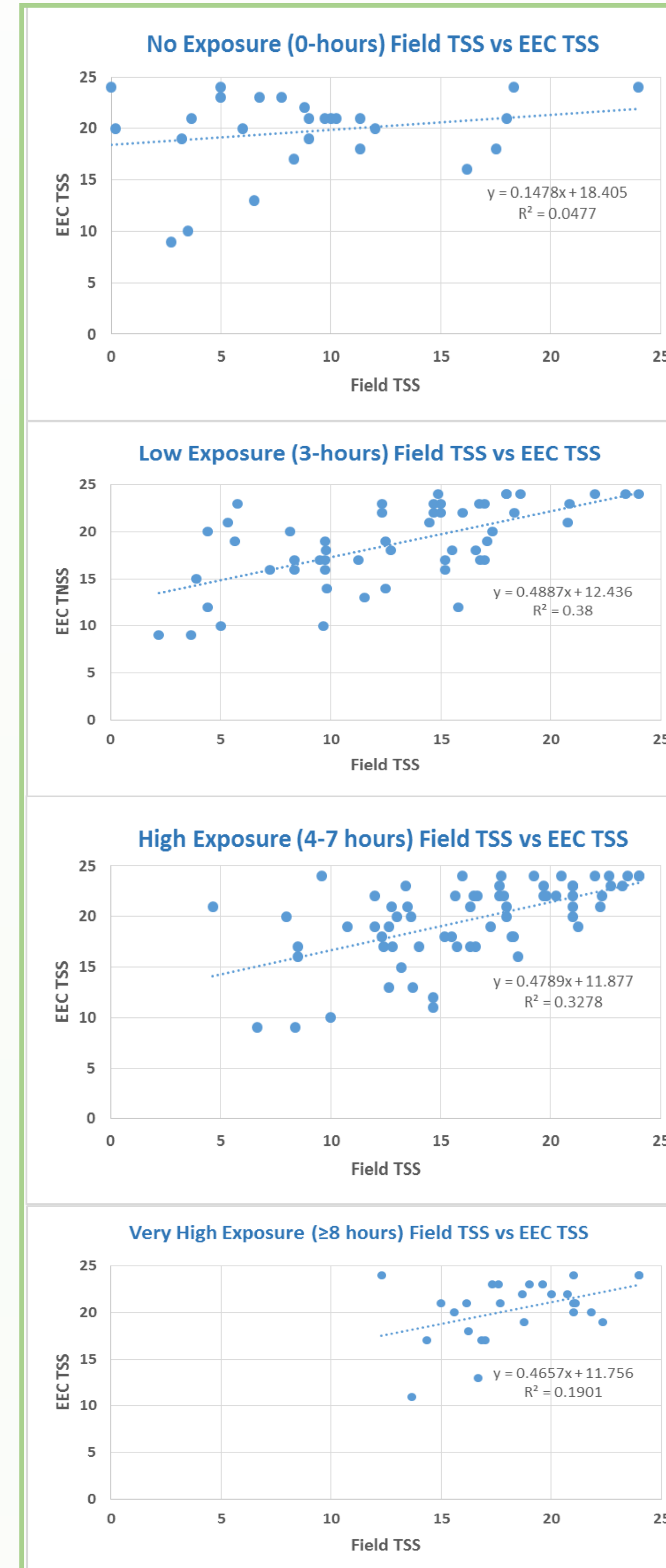
Results



- Subjects data were included in the analysis only if they reported their TSS for at least 3 days out of the at-home daily assessments.
- Average TSS for the same subjects who reported no exposure in the field showed no correlation ($r=0.218$, $p=0.274$).
- Subjects who reported daily outdoor exposure of 0-3 hours had the strongest significant positive correlation between field and EEC ($r=0.6.16$, $p<0.0001$).
- Subjects who were exposed for 4-7 hours outside also had a highly significant strong positive correlation ($r= 0.5726$, $p<0.0001$).
- Subjects exposed ≥ 8 hours daily reported the highest TSS however while statistically significant, less positive correlation was observed ($r= 0.436$, $p<0.023$).

Exposure (hours)	No (0)	Low (0-3)	High (4-7)	Very high (≥ 8)
EEC TSS	19.74 \pm 3.95	18.72 \pm 4.28	19.67 \pm 3.89	20.37 \pm 3.26
Field TSS	9.04 \pm 5.83	12.86 \pm 5.40	16.28 \pm 4.65	18.50 \pm 3.05

Table displaying TSS average and standard deviation values for different populations of subjects.



Conclusions

- Many factors should be considered when evaluating the relationship between allergy symptoms in EEC versus field.
- Specifically, the amount of time subjects spend outdoors and their perceptions of allergen exposure are important considerations that show the EEC can be used to approximate everyday pollen exposures in clinical trials.
- The EEC represents a promising tool to enhance the reliability and comparability of clinical data by controlling confounding variables that are inherent to traditional field-based trials.

References

- Day JH, Horak F, Briscoe MP, et al. The role of allergen challenge chambers in the evaluation of anti-allergic medication: an international consensus paper. Clin Exp Allergy Rev 2006a; 6: 31-59.
- Hohlfeld JM, Holland-Letz T, Larbig M, Lavae-Mokhtari M, Wierenga E, Kapsenberg M, et al. Diagnostic value of outcome measures following allergen exposure in an environmental challenge chamber compared with natural conditions. Clin Exp Allergy 2010; 40: 998-1006.

