

## INTRODUCTION

- Approximately half of patients with Chronic rhinosinusitis with nasal polyps (CRSwNP) have comorbid asthma. Both Asthma and CRSwNP are frequently noted to show considerable overlap in presentation.
- A recent study reported that the presence of nasal polyps is predictive of a positive asthma outcome with the use of benralizumab, however the impact of benralizumab on CRSwNP was not included in the study.
- To our knowledge, benralizumab has not been studied for its impact on outcome measures related to both severe eosinophilic Asthma (SA) and CRSwNP simultaneously. Given the role of eosinophils and IL-5 in the pathogenesis of both these diseases, we hypothesized that benralizumab would lead to objective and subjective improvement in both SA and CRSwNP.

## METHODS

### Study design:

Retrospective study

### Methods:

- Patients that were diagnosed with both physician-diagnosed-SA and CRSwNP from a single tertiary care center and treated with benralizumab between 2018 and 2019 were compiled.
- Only those patients that reported benralizumab usage for at least four months were included in the study.
- Demographics, co-morbidities, asthma biomarkers, past history regarding SA and CRSwNP were collected.
- Pulmonary outcomes included Asthma Control Test (ACT), fractional exhaled nitric oxide (FeNO) levels and pre-bronchodilator pulmonary function metric, forced expiratory volume in one second (FEV1).
- Sinonasal outcomes included total Sinonasal Outcome Test (SNOT-22) score and its four sub-domains - rhinologic, facial, sleep-related and psychological sub domains and Meltzer endoscopic polyp scores.

- Comparison of variables before and after therapy was performed using paired t-test. SPSS v.25 software was used for statistical analysis.

## RESULTS

- Twenty-three patients were included and the mean age at the time of enrollment into benralizumab therapy was  $50.47 \pm 17.3$  years.
- 87% patients had undergone sinonasal surgeries in the past for CRSwNP.

### Pulmonary outcomes:

- There was significant improvement in **ACT scores** (Pre vs. post therapy:  $17.05 \pm 6.17$  vs.  $19.94 \pm 5.08$ ;  $p=0.03$ ).
- A significant improvement in **FEV1 levels** ( $1.88 \pm 0.64$  vs.  $2.43 \pm 1.02$  mL;  $p=0.04$ ) was noted.
- A non-significant reduction of **FeNO levels** ( $62.85 \pm 16.13$  vs.  $48.85 \pm 30.93$ ;  $p=0.38$ ) was found.

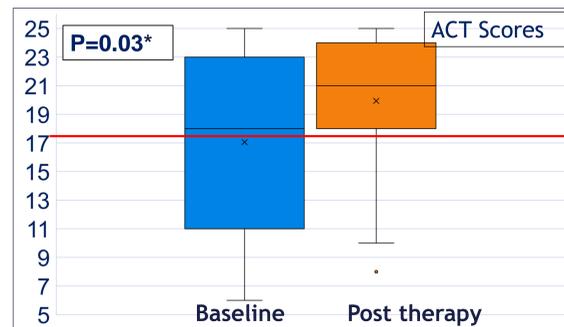


Figure 1: Comparison of ACT Scores between pre (Blue box) & post-therapy (Orange box). Redline denotes ACT score of 18.

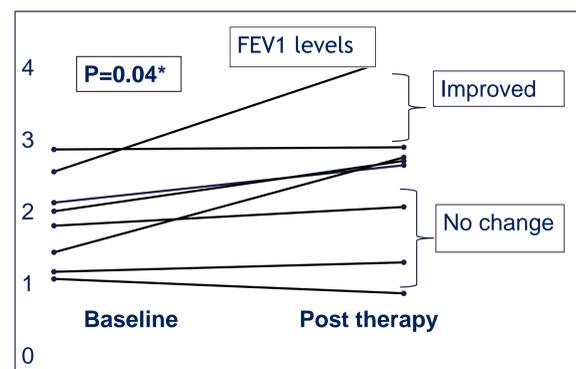


Figure 2: Comparison of FEV1 levels between baseline and post-therapy

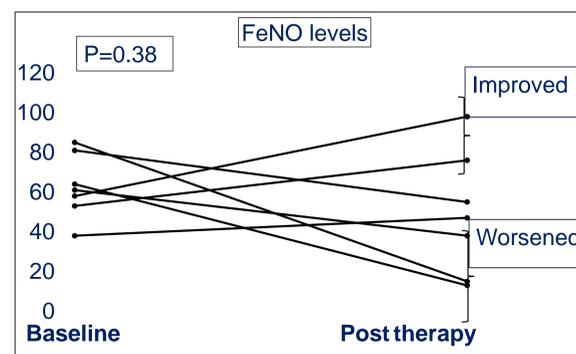


Figure 3: Comparison of FeNO levels between baseline and post-therapy

### Sinonasal outcomes:

- The mean **total SNOT-22 scores** ( $46.35 \pm 24.96$  vs.  $25.79 \pm 23.84$ ;  $p=0.009$ ) and its two sub domains - **rhinologic** ( $22.15 \pm 8.83$  vs.  $11.15 \pm 7.73$ ;  $p=0.006$ ) and **facial domains** ( $5.61 \pm 5.34$  vs.  $3.46 \pm 4.17$ ;  $p=0.005$ ) were significantly lower. The **sleep** ( $16.3 \pm 15.07$  vs.  $8.69 \pm 12.18$ ;  $p=0.1$ ) and **psychological domains** ( $1.53 \pm 2.22$  vs.  $1.54 \pm 2.96$ ;  $p=1.00$ ) showed non-significant reduction.

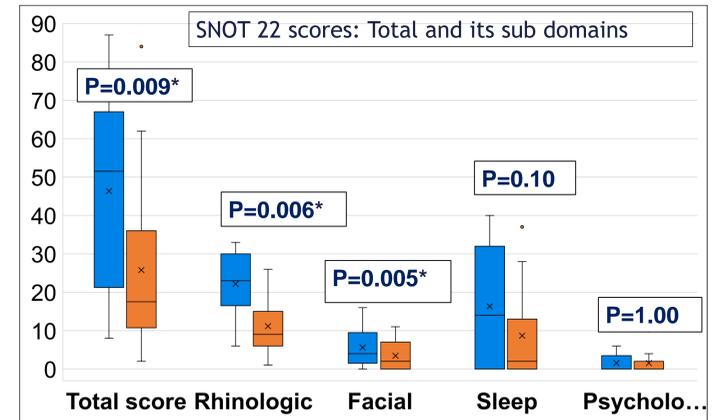


Figure 4: Comparison of SNOT-22 Scores (Total scores and its four sub-domains) between baseline (Blue box) and post-therapy (Orange box)

- A statistically non-significant reduction in bilateral Meltzer endoscopic polyp score ( $3.12 \pm 2.04$  vs.  $2.00 \pm 2.67$ ;  $p=0.2$ ) was observed.

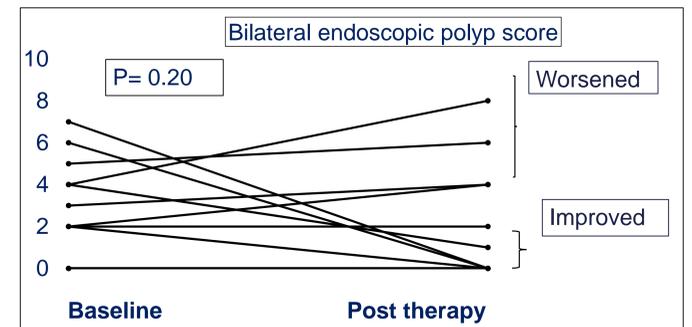


Figure 5: Comparison of Meltzer's endoscopic polyp scores between baseline and post-therapy

Overall, it was observed that benralizumab therapy lead to improvement in sinonasal and pulmonary outcomes in majority of the patients.

## CONCLUSIONS

- Among the patients that have both severe eosinophilic asthma and chronic rhinosinusitis with polyps, a subset of patients achieved better asthma control, lung function and sinonasal quality of life with benralizumab therapy.

## REFERENCES

- Promsopa C, Kansara S, Citardi MJ, Fakhri S, Porter P, Luong A. Prevalence of confirmed asthma varies in chronic rhinosinusitis subtypes. Int Forum Allergy Rhinol. 2016 Apr;6(4):373-377.
- Bleecker ER, Wechsler ME, FitzGerald JM, et al. Baseline patient factors impact on the clinical efficacy of benralizumab for severe asthma. Eur Respir J. 2018;52(4):1800936