Eosinophilia indicates Worse Sinus Disease in Patients Without Polyps.

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Materials and Methods

The Augusta University Institutional Review Board granted approval for this study. Prospective collected data from a tertiary care academic rhinology practice were analyzed. All patients had a diagnosis of CRS based on the Rhinosinusitis Task Force criteria endorsed by the American Academy of Otolaryngology-Head and Neck Surgery1, Sino-Nasal Outcome Test (SNOT-20) and Lund-Kennedy endoscopy scores were documented before, one week after surgery (first visit) and at long-term follow-up (last visit). All patients underwent Functional Endoscopic Sinus Surgery by the senior author (S.K) after failing appropriate medical therapy. Postoperatively patients without eosinophila were treated with normal saline nasal irrigations, intranasal steroid spray and postoperative debridements as needed. Patients with eosinophila were treated similarly in addition to a leukotriene receptor antagonist. Both patient groups received postoperative pain medications and oral antibiotics for 10 days. None received pre or postoperative oral steroids. Patient inclusion criteria in the study required a clinical and histopathological diagnosis of eCRSsNP or neCRSsNP according to postoperative analysis of mucosal tissue eosinophilia. In addition, we only included patients with similar follow-up length. Patients with revision surgery, cystic fibrosis, diabetes or any form of immunodeficiency were excluded. Mucosal eosinophils were counted in 5 high power fields and averaged to determine the degree of eosinophilia. Patients with >= 20 eosinophils per high-power-field (HPF) were classified as eCRSsNP and with < 5 eosinophils per HPF are classified as neCRSsNP. Average follow-up was 17.5 months (Last Visit). Since study variables are reported as averages, the independent sample t-test was used to calculate statistical significance.

Introduction

Chronic rhinosinusitis (CRS) is one of the most common chronic inflammatory conditions in North America, with an estimated prevalence ranging from 5% to 16% and a $22 billion overall annual economic burden in 20142,3. Subsets of CRS patients are those with and without mucosal tissue eosinophilia and with/without polyps (e/neCRSsSNP). Patients with eCRSsNP are known to have more aggressive disease, however, eCRSsNP patients have not been studied well. The goal of this study is to evaluate the significance of eosinophilia on surgical outcomes in patients without polyps and compare to a group of patients without eosinophilia and without polyps (neCRSsNP)

Results

A total of 69 patients were enrolled into the study. The demographic characteristics of the cohort are shown in Table 1. The pre-operative SNOT-20 scores for the eCRSsNP group are statistically different than those at the first and last postoperative visit. However, there was no statistical difference between the first and the last postoperative visit meaning that subjective improvement is achieved immediately after surgery. The pre-operative SNOT-20 scores for neCRSsNP patients are not statistically different than those at the first and last postoperative visit. However, a 57.43% reduction in their SNOT-20 score is seen. The neCRSsNP group experience a higher preoperative SNOT-20 score when compared to eCRSsNP (p<0.05). (Table 2). Endoscopy scores in eCRSsNP are statistically different and continue to improve over time. The first postoperative endoscopy score in neCRSsNP patients is statistically different than the preoperative and first postoperative endoscopy score. In comparison to SNOT-20 scores, neCRSsNP patients experience more objective improvement as seen on endoscopy scores. (Table 3): SNOT-20 scores in both groups significantly improve after the first postoperative visit; however, there was no statistically significant difference between groups at the first and last postoperative visit. Endoscopy scores showed that neCRSsNP had statistically significant lower scores when compared to eCRSsNP patients in addition to experiencing better results.

Discussion

This study examined the impact of tissue eosinophilia on surgical outcomes in patients with CRS without nasal polyps. From a clinical and research perspective, several authors have discussed different classification systems for CRS4,5. Usually the presence or absence of nasal polyps (NP) is considered the defining feature6,7. We use the presence or absence of eosinophila to guide our treatment postoperatively due to the fact that we consider eCRSsNP patients to have a different disease manifestation when compared to neCRSsNP. This helps explain why long-term patients with eCRSsNP experience worse endoscopy scores compared to neCRSsNP patients. Previous studies have examined the effect of mucosal tissue eosinophilia on quality of life or amount of eosinophila present but have not examined both factors together7,8. Soler et al9 in a population of 201 patients followed-up for a period of 16.5 months found that eCRSsNP patients had less improvement in quality of life which is similar to the results we found. However, in contrast to our study, Soler et al had patients received oral prednisone taper seven days before surgery and oral antibiotics that may have altered mucosal inflammation and mucosal eosinophilia. Multiple studies have shown that surgery improves postoperative symptom scores in CRS patients10,11, However, it is crucial to classify patients according to mucosal tissue eosinophilia, as eCRSsNP patients require long-term medical treatment and are prone to recurrence and eventual revision surgical procedures. As opposed to previous studies, we didn’t use systemic steroids or antibiotics preoperatively which could have altered mucosal eosinophilia. To be clinically useful, the knowledge of mucosal tissue eosinophilia is a must since it provides prognostic information about disease severity/outcome and allows planned decision making regarding medical treatment. However, these results cannot be generalized, larger multicenter and community based studies will be necessary to validate the results.

Conclusions

1. The postoperative identification of mucosa tissue eosinophilia in CRS patients seems to play a cardinal role in clinical outcome.
2. Patients with neCRSsNP have higher SNOT-20 preoperative score when compared to eCRSsNP patients but experience a faster recovery.
3. Both neCRSsNP and eCRSsNP show sustained improvement at long-term follow up. However, eCRSsNP patients have more objective evidence of long-term disease seen by endoscopy scores and require longer follow-up due to the more chronic nature of the disease.

References