ABSTRACT

Objectives:
Describe the incidence of pepsin positivity in nasopharyngeal specimens of pediatric patients undergoing surgical management of chronic rhinosinusitis (CRS) with adenoidectomy (ADX) versus functional endoscopic sinus surgery (FESS) in comparison to controls without CRS.

Methods:
Cohort study was conducted of pediatric patients with CRS refractory to medical management undergoing either adenoidectomy or FESS from March, 2014, to October, 2015. All patients, including controls, had nasopharyngeal secretions lavaged for pepsin. FESS patients had unincate biopsies and ADX patients had an adenoid specimen. Immunoblotting was used to detect pepsin in obtained specimens.

Results:
A total of 29 patients, ages 1.4-15.4 years, were divided into three groups: adenoidectomy (n=12), FESS (n=11), and control (n=6). Pepsin was detected in 6/12 adenoidectomy patients (3 lavages, 3 biopsies), 2/11 FESS patients (from nasal lavage), and 0/6 control patients. No patient had both lavage and biopsy positivity. Pepsin positivity was significantly greater in adenoidectomy patients compared control patients (p=.03).

Conclusion:
While refractory CRS has been associated with extraesophageal reflux (EER) by detection of pepsin in adult nasopharyngeal specimens, this has not been studied in the pediatric population. Our pilot study demonstrates that pepsin positivity in nasopharyngeal specimens is found in a substantial portion of pediatric patients with refractory CRS who undergo ADX, though it is rarely seen in the same population undergoing FESS. Future, larger studies will help elucidate differences in pepsin presence in secretions compared to tissue, and further characterize the role of pepsin in CRS.

METHODS AND MATERIALS

Patient Selection:
- Tertiary care pediatrics hospital in WI
- March 2014 – October 2015
- Undergoing either 1) adenoidectomy or 2) FESS indicated for CRS that failed medical management
- Controls = undergoing ENT procedure for non-CRS indications

Nasal Lavage Fluid Samples and Biopsy Samples
- All patients had nasal lavage
- Biopsy samples:
  - ADX patients = adenoid tissue
  - FESS patients = unincate tissue

SDS-Page/Western Blot
- Antibody detection of human pepsin A protein

Statistical Analysis
- Chi-squared test

RESULTS

Pepsin Positivity in Patients Undergoing Adenoidectomy

- 29 total patients:
  - With CRS (n=23)
    - FESS (n=11)
    - ADX (n=12)
  - Controls (n=6)
- Pepsin was not detected in any samples from control patients.
- No patient had pepsin positivity in both lavage and biopsy samples.
- All patients undergoing FESS had previous ADX.

Figure 1. A) Breakdown of ADX patients with either pepsin positive lavage or adenoid biopsy or negative sampling. B) Breakdown of FESS patients with either pepsin positive lavage or unincate biopsy or negative sampling.

FUTURE DIRECTIONS

- Age-match comparison between ADX, FESS, and control groups.
- Evaluate ADX specimens from non-CRS for pepsin (i.e. OSA).
- Investigate potential cell and molecular biological differences between pediatric and adult adenoid tissue contributing to differences in pepsin uptake.
- Evaluate whether acid and/or pepsin-targeting reflux treatment may be of benefit in pediatric CRS.
- Improve understanding of why pediatric adenoid tissue incorporates pepsin vs adult nasopharyngeal tissue.
- To elucidate if medical reflux treatment is warranted in Pediatric CRS.

CONCLUSIONS

- Pepsin was detected in adenoid specimens of pediatric patients with CRS.
- Pepsin was not detected in sinus tissue.
- Pepsin was detected in nasal lavage of both FESS and ADX.
- No pepsin was detected in controls.
- Association between EER and medically refractory CRS in children described here warrants further investigation.

REFERENCES