apy affects the speed and rate of recovery of patients with acute rhinosinusitis.

**Study Population.** Patients 18 years or older presenting with acute sinusosal symptoms and a history of previously diagnosed recurrent or chronic sinusitis that necessitated antibiotic therapy were eligible for enrollment. All patients were required to have evidence of sinus infection on either plain film sinus radiograph (Waters view) or nasal endoscopy. Subjects were screened using the major symptom criteria for acute rhinosinusitis developed by the Task Force on Rhinosinusitis of the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS). These criteria included the following: headache; facial pain and pressure; nasal congestion; thick, colored nasal discharge; and olfactory disturbance. Patients with 2 or more of these 5 symptoms were eligible for enrollment. Excluded were patients with nasal polyposis, previous sinus surgery, chronic bacterial sinusitis with failure of antimicrobial therapy, intranasal steroids within the past 14 days, or antimicrobial treatment in the past 7 days.

**Methods.** This double-blind, randomized, placebo-controlled multicenter trial randomly assigned patients to 2 puffs (total dose: 200 µg) of fluticasone propionate (Flonase, GlaxoSmithKline) or placebo nasal spray taken once a day in each nostril for 21 days. All patients received cefuroxime axetil (Ceftin, GlaxoSmithKline) 250 mg twice daily for 10 days, as well as 2 puffs of xylometazoline hydrochloride per nostril twice daily for 3 days, 10 minutes before using study nasal spray. Oral antihistamines, oral decongestants, and mucolytics were not allowed. The primary outcome was the proportion of patients in each treatment group who experienced clinical success (patient-reported cure or much improved) at 10, 21, or 56 days, based on telephone follow-up. Secondary outcomes included differences over time in the sinusitis and general health quality of life scores via survey.

**Results.** A total of 58 (93%) patients completed follow-up. Patients recorded their symptoms, work assessment, and compliance during the 3-week treatment phase. Patients receiving fluticasone achieved a significantly higher rate of clinical success than patients receiving placebo (93.5% vs 73.9%; P = .009). Patients treated with fluticasone improved significantly more rapidly (median of 6.0 days to clinical success) versus patients in the placebo group (median of 9.5 days; P = .01). An absolute benefit increase of 19.6% (95% confidence interval [CI]: 5.3%–33.9%) was noted; hence, the number needed to treat with fluticasone to gain 1 additional cure was 6 patients (95% CI: 3–19). Sinusitis-related quality of life, as determined via survey, improved equally over time for both treatment groups. Patients treated with fluticasone had a higher subjective level of work performance that was statistically significant on day 21 (P = .009).

**Conclusions.** Patients with acute parasal sinusitis were more likely to achieve clinical improvement when treated with fluticasone and cefuroxime than with cefuroxime alone. For every 6 patients treated with fluticasone, cefuroxime, and xylometazoline, 1 additional patient is cured compared with patients treated with cefuroxime and xylometazoline alone.

**Reviewers’ Comments.** More studies are needed to assess the impact of intranasal corticosteroids on patients with acute sinusitis, as well as those who present with symptoms of sinusitis but negative radiographs or endoscopic findings. Evaluation of subjects with chronic bacterial sinusitis as well as nasal polyposis is needed as well. Nevertheless, sinusitis treatment guidelines should be amended to include intranasal corticosteroids as adjunct therapy to antibiotics for acute sinusitis to enhance recovery.

**CLINICAL OUTCOME OF PEDIATRIC ENDOSCOPIC SINUS SURGERY**


**Purpose of the Study.** To assess the efficacy of functional endoscopic sinus surgery (FESS) in children based on a clinical symptom survey.

**Study Population.** Preoperative and postoperative clinical outcome surveys were completed for 23 children (11 girls and 12 boys) who underwent FESS for sinusitis refractory to medical treatment. The average age at the time of surgery was 6 years (range: 2–13 years).

**Methods.** A clinical outcome survey based on modification of the short form (SF)-36 global health assessment was completed by parents of 27 children before FESS. Approximately 2 years after surgery (range: 22.4–33.3 months), the same survey was completed by the parents of 23 children during a telephone interview. No control groups were studied. The survey consisted of 19 questions aimed at determining functional status and quality of life, as well as obtaining information about the incidence of allergies, asthma, and immune deficiencies. These authors also collected data on the presenting symptoms of sinusitis, the presence of nasal polyps, the type of sinus surgery performed, the severity of sinusitis based on preoperative computed tomography (CT), and the need for revision surgery.

**Results.** The most common presenting symptoms before FESS were purulent nasal discharge and chronic nasal congestion. Allergies were present in 70%, asthma in 35%, immunodeficiency in 4%, and nasal polyps in 13%. Two children (9%) required revision FESS. The survey results showed a decrease in symptom score (clinical improvement) for each of 15 outcome categories. There were statistically significant improvements in 9 of 15 categories, including frequency of cough, nasal obstruction, visits to the doctor, problems with routine activities, problems with conduct at school or school attendance, problems with parental performance at work, and problems with parental performance at home related to the child’s condition. Children with more severe disease on CT scan demonstrated less overall improvement, while those with asthma had a larger overall improvement in postoperative survey scores.

**Conclusions.** The results reveal an improvement in clinical symptoms and overall quality of life, based on parental report on a survey, for children undergoing FESS for chronic sinusitis. The study supports pediatric FESS as an effective treatment for children with sinusitis that persists after medical therapy.

**Reviewers’ Comments.** Chronic sinusitis in children is a multifactorial disease, sharing characteristic symptoms with other common diagnoses such as allergic rhinitis and viral upper respiratory tract infection. Although the majority of cases of bacterial sinusitis respond favorably to medical management or adenoidectomy, sinus surgery may play a role in the treatment of children with persistent disease. Although previous studies have evaluated the efficacy of pediatric FESS based on symptom scores, these authors incorporated a global health survey to further quantify the benefits of sinus surgery on daily function and quality of life of both the child and the caregiver. The survey used was a modification of the SF-36 Health Survey, which is used in outcome studies of chronic sinusitis in adults. This study is limited by the relatively small
sample size of 23 children. Although preoperative survey results are used for comparison in each child, there is no control group. Ideally, the same survey would be given to a group of children/parents with sinusitis treated without surgery, to assess the effects of natural history or nonsurgical therapy. Comparison with this control group would more fully quantify the benefits of surgery. It is not clear how these 27 children were selected for study. Were they part of a larger surgical group, with some patients excluded from study? Was this a series of consecutive patients undergoing FESS for defined surgical indications? These issues affect how we can generalize the conclusions of this report. It is unlikely that we will see a randomized, prospective trial of FESS in children. Outcome studies such as this one, measuring symptom scores and quality of life changes, give support for the use of FESS in children with refractory sinus disease.

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CORRELATION BETWEEN PRESUMED SINUSITIS-INDUCED PAIN AND PARANASAL SINUS COMPUTED TOMOGRAPHIC FINDINGS


Purpose of the Study. Sinusitis is typically a clinical diagnosis based on history and symptoms. This study investigated the correlation between clinical symptoms of facial and/or head pain and actual localized findings consistent with a sinusitis on sinus computed tomographic (CT) imaging.

Study Population. Two hundred patients with a clinical history of sinusitis that were referred by their internist or otolaryngologist for CT imaging of the paranasal sinuses.

Methods. Before the CT scanning, each patient was asked to complete a sinus questionnaire that inquired about pain in 8 different areas of the head and neck, the duration of illness, use of allergy medications, smoking, pets, and seasonal variation of pain symptoms. All CT scans were independently scored by 3 radiologists who were blinded to the patients’ questionnaire responses. The scores were then averaged.

Results. Eighty-two percent reported having some form of facial pain or headache; the right temple/forehead was the most common reported site. Six percent were considered to have acute sinusitis, 14% had a history of sinus surgery, 12% were smokers, and 53% owned pets. Nine percent had no abnormalities on the CT scan. The maxillary sinus was the most frequently (68%) involved sinus. No correlation could be found between the reported sites of pain and findings on CT. Furthermore, no relationships were found between the sinus CT findings and smoking, owning a pet, or duration of pain symptoms. Similar numbers of sites of pain (5.45 and 5.88) were reported between patients with and without CT findings.

Conclusions. This study demonstrated that there was a lack of correlation between reported site of pain and CT findings. Two key points the author stated are 1) symptoms of pain alone may not be sufficient to diagnose sinusitis and 2) the limited value of CT scans for evaluating patients with facial pain/headaches only or patients with a low suspicion for sinusitis.

Reviewers’ Comments. Most clinical diagnoses of sinusitis involve more than facial pain or headache alone. The diagnosis is based on a compilation of symptoms that may include fever, facial swelling/tenderness, purulent drainage, cough, malodorous breath, and nasal congestion. It is not clear that these patients had more than facial pain alone, which would not be sufficient for clinical diagnosis. Although these patients were referred by internists and otolaryngologists for imaging of their paranasal sinuses, the specific indications for the CT scan are not clear. For example, CT scans may have been ordered after antibiotic treatment to rule out structural abnormalities. Overall, this article does make an important point that facial pain does not equate with sinus disease.

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Asthma

PATHOPHYSIOLOGY

VIRAL INDUCTION OF A CHRONIC ASTHMA PHENOTYPE AND GENETIC SEGREGATION FROM THE ACUTE RESPONSE


Purpose of Study. To address the role of persistent infection and cytokine bias in the development of the chronic asthma phenotype after paramyxoviral infection.

Methods. The investigators used a mouse model of paramyxoviral bronchiolitis with acute pathology similar to the human condition. Wild-type C57BL/6j, same-strain interferon gamma (IFN-γ)-null mice and same-strain intercellular adhesion molecule-1 (ICAM-1)-null mice were maintained under pathogen-free conditions for study at 7 to 9 weeks of age. Mice were inoculated with mouse para-influenza virus type 1 (Sendai virus; SeV Fushimi strain) or ultraviolet (UV)-inactivated SeV. Histochemistry of the mouse lung, bronchoalveolar lavage fluid analysis, and airway reactivity measurements to aerosolized methacholine were performed. In addition, allergen challenges were performed with ovalbumin using sensitized and nonsensitized C57BL/6j mice.

Results. Following a single paramyxoviral infection of mice (C57BL6/J strain), the investigators demonstrate that not only does this produce acute bronchiolitis, but also a chronic lung response with airway hyperreactivity and goblet cell hyperplasia lasting at least 1 year after complete viral clearance. During the acute response to virus, same-strain ICAM-1-null mice are protected from airway inflammation and hyperreactivity despite similar viral infections rates; however, the chronic response proceeds despite ICAM-1 deficiency. Neither response is influenced by IFN-γ deficiency, but the chronic response is at least partially prevented by glucocorticoid treatment. In contrast to viral infection, allergen challenge caused only short-term expression of asthma phenotypes.

Conclusions. Paramyxoviruses cause both acute airway inflammation/hyperreactivity and chronic airway remodeling/hyperreactivity phenotypes. These 2 phenotypes can be segregated by their dependence on the ICAM-1 gene and so depend on distinct controls that appear critical for the development of lifelong airway diseases such as asthma. These findings raise the possibility that asthma not only resembles a persistent antiviral response, but also may be caused by such a response. These data may help...
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