Otorinolaryngologic therapy

Sinusitis therapy

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Background

Chronic sinusitis affects up to 100% of CF patients and symptoms as daily headache, chronic cough and purulent rhinorrhea are common (Le C, 2016). Quantitative sinonasal symptom assessment in the pediatric population (Wentzel JL, 2015) and in the adult one (Habib AR, 2015) has been studied.

Correlation between sinus condition and low respiratory tract diseases other than CF, such as asthma and chronic obstructive pulmonary disease, has often been demonstrated and there is evidence that treating upper airways leads to improved conditions of lower airways. In CF, sinusitis has been considered a risk factor for pulmonary decline also because the sinusal area may be a reservoir for bacteria (Johansen HK, 2012) (Passarelli Mantovani R, 2020) and a focus for initial lung colonization (Aanæs K, 2014) . Even if moderate agreement has been reported between sinus and pulmonary cultures of the upper and lower airways in a large cohort of pediatric CF patients (Sobin L, 2017), there is high correlation between pre-transplant sinus cultures and post-transplant BAL cultures and paranasal sinuses may be consider a reservoir for allograft colonization in lung transplanted patients (Choi KJ, 2018), (Morlacchi LC, 2018)

Chronic sinusitis diagnosis is based on nasal endoscopy and paranasal sinus computerised tomography (Casserly P, 2015) A computed tomography scoring system for sinus disease in adults has been validated (Sheikh SI, 2016),.

Conservative therapy, including sinus irrigations, mucolytics, and systemic and topical corticosteroids, is usually prescribed. In a systematic review (Liang J, 2014) about medical management of chronic rhinosinusitis in CF, data from 12 studies on 701 adult and pediatric CF patients showed that dornase alfa and, to a lesser extent, topical steroids have demonstrated significant benefits, whereas there was a lack of evidence to support antibiotic therapy.

When medical management fails, patients must be referred for endoscopic sinus surgery, that has proved (Macdonald KI, 2012), to be safe also in children (Tumin D, 2017), to relieve symptoms (Lazio MS, 2019) and to improve pulmonary function tests (Khalfoun S, 2018) in patients with moderate/severe lung disease**.** Sinus surgery and daily nasal douching in post-lung transplant patients has also shown to reduce P.aeruginosa chronic lung infection, to have a positive impact on post-transplant survival and to reduce the incidence of Bronchiolitis Obstructive Syndrome (BOS) (Vital D, 2013) (Cheng TZ, 2019).

A pilot study (Spielman DB, 2021) has demonstrated safety and feasibility of performing revision endoscopic sinus surgery for CF patients in the outpatient office setting, using only local anesthesia to decrease the need for mechanical ventilation and inpatient hospitalization. Nevertheless, a meta-analysis (Yin M, 2021) that included 12 studies with 570 enrolled patients, did not show pulmonary function improvement after endoscopic sinus surgery. More recently (Ji KSY, 2022) a study has shown that patients colonized with P. aeruginosa and older age are associated with less favorable outcomes and another study (Dadgostar A, 2021) did not demonstate a lung function significant improvement and a decrease of the number of pulmonary exacerbations postoperatively

It has been affirmed (McCormick J, 2019) that Ivacaftor treatment may reverse CT findings of CF sinus disease. More recently (Lee SE, 2020) it has been affirmed that, there is a paucity of literature describing the effect of CFTR modulators on CF-associated chronic sinusitis, although initial results are encouraging. In 2022 (Stapleton AL, 2022) a study showed that sinosal symptoms, endoscopic and CT findings improve rapidly and durably on ELX/TEZ/IVA

Recent reviews about current management and new treatment in chronic rhinosinusitis in CF have been published (Johnson BJ, 2020) , (Jayawardena A D, 2020), (Okafor S, 2020), (Krajewska J, 2022)

Issues

Conservative topical therapy associated with the best efficacy and safety results.

Antibiotic protocols (dosage, duration and administration modalities) associated with the best efficacy and safety results.

Indications, outcomes and management of endoscopic sinus surgery.

What is known

In 2022 a Cochrane Systematic Review (Karanth T K, 2022) to compare the effects of different medical interventions in people diagnosed with cystic fibrosis and chronic rhinosinusitis. identified 44 trials about this issue, but none of these was considered eligible for inclusion.

A systematic DARE review (Mcdonald KI, 2012) evaluating subjective and objective outcomes of endoscopic sinus surgery (ESS), is available. Nineteen studies involving 586 patients were included. Considered outcomes have been safety, subjective symptoms, objective endoscopy scores, days spent in hospital, courses of antibiotics and pulmonary function tests. ESS showed to be safe, associated with improved symptoms, even if no marked improvement in pulmonary function tests was demonstrated.

In another DARE review (Liang J, 2013) EES proved to be effective in improving sino-nasal symptoms and endoscopic findings, even if its clinical impact on lower airway disease remains unclear.

A good efficacy and tolerability of a new nasal spray formulation containing hyaluronate and tobramycin in patients with bacterial sinusitis has been suggested in a RCT published in 2014 (Di Cicco M, 2014)

A systematic review (Shah GB, 2018) showed that topical intranasal dornase appears to improve sinonasal symptoms in CF patients to a greater degree than saline alone.

Unresolved questions

Safety and efficacy of different protocols and antibiotic regimens in conservative therapy.

Indication, role, and timing of sinus surgery considering endoscopy scales, sinus microbiology evolution, symptoms and prognosis of the underlying disease and validated quality of life measurements.

A prospective observational study about patients who undergo endoscopic sinus surgery (NCT04469439) is ongoing

A randomized, parallel assignment trial (NCT06996951) aims to sample the sinonasal environment for inflammatory markers in adult patients with cystic fibrosis (PwCF) on HEMT and chronic rhinosinusitis and correlate to subjective and objective clinical findings during de-escalation from saline nasal irrigations, topical nasal steroids and/or antibiotics

Keywords

Bacterial Infections; Sinusitis;