

Dear Doctor,

Greetings from Micro Labs. We are happy to bring you "Allergy Newsletter" which contains latest and interesting news in the field of Allergy.

This issue contains:

- 1. Relationship between childhood infection, and asthma, and allergies across the life course and chronic rhino-sinusitis in middle age**
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Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Ltd

Relationship between childhood infection, and asthma, and allergies across the life course and chronic rhino-sinusitis in middle age

Introduction

Adult chronic rhinosinusitis (CRS) is an inflammatory condition affecting the mucosal lining of the nasal cavity and paranasal sinuses, which can have a negative impact on general well-being, quality of life, and daily activities.¹ The cardinal symptoms of nasal blockage and/or discharge can lead to headaches, poor sleep and exhaustion, impaired work ability, and loss of income and production due to excessive work absences, resulting in a substantial expense to individuals, families, and society. Studies have shown associations between asthma/allergies and the development of CRS

into early adulthood, as well as CRS and the development of asthma. Previous studies have not retrospectively documented the history of asthma/allergies in middle age, nor have they explored whether CRS originates in childhood.² So, this study was carried out to examine the association between childhood infective/allergic conditions and CRS in the middle-age.³



Methods

This was a population based Tasmanian Longitudinal Health Study (TAHS) cohort where the study began in 1968 with 8583 participants aged 6-7 years, and was followed up to middle age (n=3609). According to the most recent follow-up, 30.6% (n=2629) of the initial cohort had skin-prick and lung function testing, and 42% (n=3609) had finished questionnaires. At age 53, individuals were assigned to a CRS-severity subtype based on a widely recognized epidemiological definition: no sinusitis/CRS (reference); prior doctor diagnosis only; present symptoms without doctor diagnosis; and doctor-diagnosed CRS with current symptoms. Multinomial regression was used to analyze associations between infectious/allergic respiratory disorders at age 7 and previously reported asthma-allergy trajectories from 7 to 53 years.

Results

A total of 3364 individuals were included for the main analysis, 2.5% (95% CI: 2.0, 3.0%) have CRS symptoms diagnosed by a doctor, 3.4% (2.8, 4.1%) also have symptoms but didn't have any diagnosis of the doctor, whereas 4.3% (3.7, 5.1%) had chronic sinusitis in their past, and most 90% who were considered reference group had no sinusitis symptoms. There was a higher occurrence of pain/ pressure compared with those members without any examination by a doctor (87.9%, [95%CI: 79, 94]). Frequent head colds (multinomial odds ratio [mOR] = 2.04 (95% confidence interval, CI]: 1.24, 3.37), frequent tonsillitis (mOR = 1.61 [95% CI: 1.00, 2.59]), and current childhood asthma (mOR = 2.23 [95% CI: 1.25, 3.98]) were among the

childhood conditions linked to symptomatic doctor-diagnosed CRS. All middle-aged CRS subtypes were related to life course trajectories that included late-onset or persistent asthma and allergies; symptomatic doctor-diagnosed CRS was associated with early-onset persistent asthma and allergies (mOR = 6.74, 95% CI: 2.76, 16.4), late-onset asthma allergies (mOR = 15.9, 95% CI: 8.06, 31.4), and late-onset hay fever (mOR = 3.02, 95% CI: 1.51, 6.06) (Figure 1).

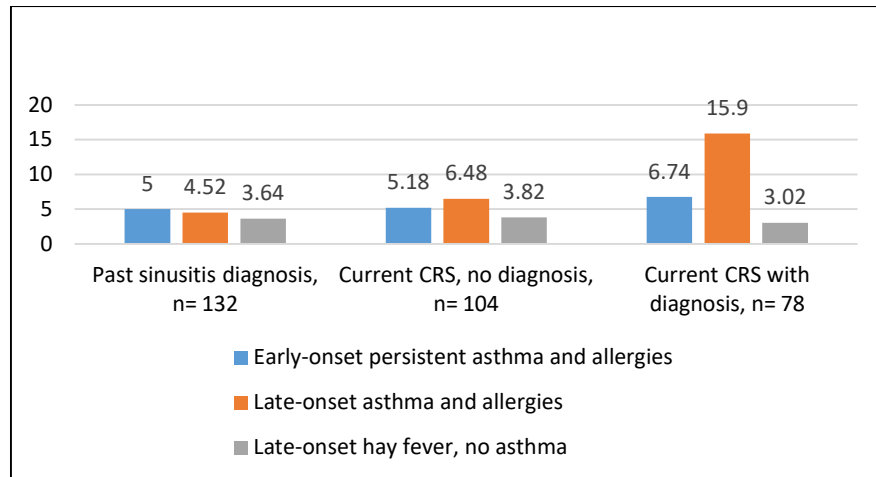


Figure 1: Multivariable association between life course asthma-allergy trajectories and adult chronic rhino-sinusitis in middle age

Discussion

The results of this prospective study, which covers the first to sixth decade of life, have demonstrated the clinical relevance of an epidemiological definition of CRS in middle age due to the significantly higher prevalence of doctor-diagnosed asthma, including current atopic asthma, and relationships to other co-morbidities associated with CRS.³ In particular, this study connected three trajectories of allergens and asthma between the ages of 7 and 53 to middle-aged CRS, indicating that hay fever, allergies, and asthma may be treatable characteristics of CRS. The presence of asthma and/or allergies at the time of CRS symptoms was a common characteristic of these trajectories. This could indicate that there was increased type II inflammation in the airways at the time of the reported CRS, which is a T-lymphocyte type-2 endotype. It also supports the concept that the recent occurrence of asthma and allergies is significant.⁴

Conclusion

Frequent head colds, tonsillitis, and asthma around age 7 may indicate a vulnerable youngster who is more likely to develop CRS in mid-adulthood and who could benefit from preventive management and/or closer monitoring. Strong correlations were found between concurrent allergies and asthma, which may be treatable characteristics of adult CRS.

Asthma at age 7 and upper respiratory infectious diseases (recurrent tonsillitis and head colds) are temporally related to middle-aged symptoms of CRS that are identified by a physician.

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Assessment of clinical outcome of specific Immunoglobulin-E in chronic rhino sinusitis: using nasal challenge test

Introduction

Chronic rhino sinusitis (CRS) is a high-impact disease that occurs due to swelling of the nasal cavity and paranasal sinuses.¹ In CRS, type 2 inflammation, also known as T2-inflammation, is the most studied endotype because it has been linked to more severe symptoms like the coexistence of nasosinus polyps, severe asthma, and nonsteroidal anti-inflammatory drug (NSAID)-exacerbated respiratory disease (NERD). The presence of specific immunoglobulin E (sIgE) in blood and the sinus mucosa is one of the clinical indicators which helps us to detect T2-inflammation.² To detect T2 inflammation, the CRS guidelines suggest that eosinophils and total IgE are crucial indicators. Although sIgE is a clinical predictor of various clinical outcomes in many type-2 disorders, its function in CRS has not yet been thoroughly investigated. So, this study was conducted to characterize systemic and local sIgE in CRS and investigate any potential correlation with clinical outcomes using nasal challenge tests (NCT).³

Methods

This descriptive cohort study was carried out with 174 patients (more than 18 years of age) with CRS. Patient's clinical information was collected from assessments like asthma control test (ACT), visual analogue scale (VAS), Sino-nasal outcome (SNOT22), total nasal symptom score (TNSS), their blood, and nasal mucus was evaluated using immunological markers. Nasal challenge test (NCT) was carried out in 73 CRS patients. Patients were classified based on the presence of SsIgE and divided into rhinitis groups and control groups. The skin prick test was

conducted where the allergenic sources include *Dermatophagoides pteronyssinus* (Der p), *Dermatophagoides farinae* (Der f), *Blomia tropicalis* (Blo t), *Canis familiaris* (Can f), *Felix domesticus* (Fel d), *Aspergillus fumigatus* (Asp f), *Grasses spp.*, *Staphylococcus aureus enterotoxins* (A and B) and measured the level of SsIgE and NsIgE. To measure the comparison between variables, Mann-Whitney U test was used and to identify the correlation between SsIgE and NsIgE, the spearman correlation coefficient was used.

Results

Overall, 174 patients were included. The most common comorbidity was asthma (36.2%), which was followed by anosmia (10.3%), sinonasal polyps (22.4%), and NERD (12.1%). The main allergen for SsIgE and NsIgE was Der p; the prevalence of SsIgE was 52.8% and that of NsIgE was 46.5%. SsIgE and NsIgE were substantially correlated with the occurrence of nasal polyps, asthma comorbidity, NSAID hypersensitivity, and hyposmia, but not with total IgE. About 33 (45.2%) of the 73 CRS patients who had NCT-Der p done tested positive. When it comes to predicting NCT findings, SsIgE has the highest diagnostic accuracy (79.4%) (NsIgE 67.5% total IgE 52%) respectively (Figure 1).

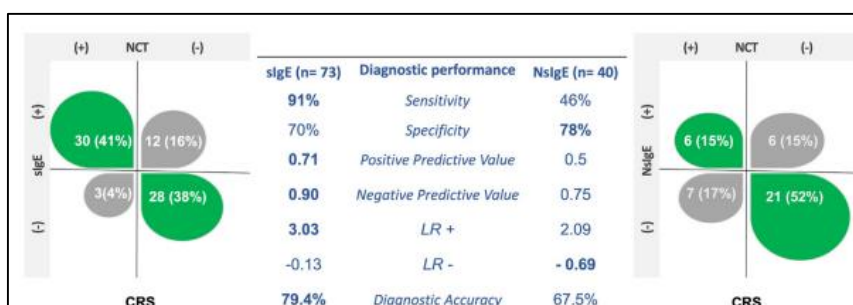


Figure 1: Diagnostic performance of patients based on NCT results for positive or negative SsIgE or NsIgE

Discussion

From the results of biologic therapy, it was observed that there is a reduction in the level of NsIgE and SsIgE showing their relevance between pathogenesis of CRS and sIgE. It highlights that sIgE acts as biomarker for type 2 inflammation.² A similar study suggested that mucosal IgE and serum IgE are some of the most promising biomarkers to predict the severity of disease, outcomes, and prior relapse.³

Conclusion

In CRS, specific IgE is a more accurate biomarker than total IgE. The pheno-endotype of patients with clinically significant SsIgE is linked to various clinical outcomes. Studies on treatments such as allergen immunotherapy for CRS are necessary given the clinical significance of SsIgE as shown by NCT.

sIgE plays a significant role in the CRS pathogenesis and is a valuable biomarker to predict the endophenotypes.

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Efficacy and safety of hydrogen-rich saline for nasal irrigation after chronic rhino-sinusitis surgery

Introduction

Chronic rhino sinusitis (CRS) is a common and refractory condition in otorhinolaryngology head & neck surgery, that has a major influence on patients' everyday lives and well-being. With a prevalence ranging from 6.1% to 27.1%, it is a diverse illness that has a detrimental impact on patients' quality of life and the prevalence of CRS is rising.¹ Since treating chronic rhino sinusitis (CRS) is frequently a challenging and protracted behaviour, it is essential to look for a long-lasting, safe, and efficient local therapy approach. Although it is currently recommended as a local therapy technique following functional endoscopic sinus surgery (FESS), nasal saline irrigation has no anti-inflammatory, anti-damage, or healing-promoting properties.^{2,3} The purpose of this study was to examine the safety and effectiveness of using hydrogen-rich saline (HRS) for nasal irrigation following CRS surgery.

Methods

This randomized double-blind parallel controlled trial was carried out for 12 weeks with 64 CRS patients, who required nasal endoscopic surgery, and randomized into two groups. In each group with 32 cases, HRS to one group and NS to another group were given. Patients who already had sinus surgery, tumors in the nasal sinus or other disease like severe liver, heart, and kidney were excluded. The patients were given cephalosporin antibiotics (IV) and dexamethasone as a combination after operation for one week and then macrolide antibiotics, expectorants (PO) for 4 weeks after discharge, and other medications also recorded. A nasal endoscopy was done to observe the edema, blood scabs, residual hemostatic materials, and vesicles in the surgical cavity. One week following surgery, two study groups started nasal irrigation, and were monitored weekly for a total of twelve weeks. The primary endpoint was to evaluate nasal symptoms and the overall assessment of the disease. Secondary endpoints were LKES, SNOT22, epithelial repair, and short-term efficacy evaluation. SAS9.4 statistics software was used for analyzing the data.

Results

The VAS scores of the two groups were reduced from baseline, from 7.68 (1.25) to 0.52 (0.85) in the HRS group and from 7.37 (1.63) to 1.47 (1.55) in the NS group, significantly reduced in

the HRS group ($P=0.005$); in the second week, the NS group was higher than the HRS group, which was statistically significant ($P<0.001$). Further, following treatment, the scores were reduced in both groups, except for swelling pain in the head and face ($P=0.326>0.05$), and other symptom scores also decreased (Figure 1). In the short-term efficacy evaluation, the HRS group (20/31) had more cases with complete control (clinical cure) overall than the NS group (11/30), $P=0.03<0.05$. During the follow-up, there were no overt negative reactions in either group.

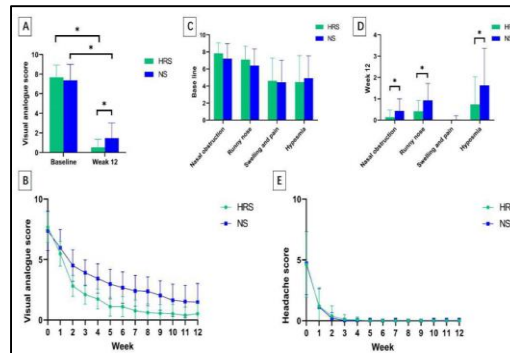


Figure 1: (A) The VAS score (baseline, week 12); (B) VAS weekly score; (C) VAS of the 4 nasal symptoms; (D) after 12 weeks (E) Headache score

Discussion

Hydrogen plays an important role due to its anti-apoptotic, anti-inflammatory, and antioxidant effects. It also has wound-healing properties, thereby repairing the mucosa and reducing the edema, and recover time of epithelial tissue. From the study, group A (HRS) achieved a complete cure within 3 months compared to group B (NS) ($P<0.05$).³ A similar study was carried out on chronic rhinitis using hydrogen-rich saline as treatment, and they found out that there were no adverse reactions, it was safe to use, and it was more effective than saline, thereby involving it in treating chronic rhinitis and other related diseases.⁴

Conclusion

HRS was superior to NS alone in nasal irrigation following CRS surgery. It also had a greater rate of recent total control and might hasten the repair and epithelialization of the nasal mucosa.

Hydrogen rich saline, more effective than normal saline in managing the post-operative CRS, thereby reduces the duration of mucosal healing, epithelialization, and complete recovery from the disease.

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Case report on Sino-nasal inverted papilloma suspected as Eosinophilic chronic rhino-sinusitis recurrence following surgery

Introduction

Chronic rhino sinusitis is an inflammatory disease that majorly affects the paranasal sinuses and nasal cavities. The pathogenesis involved, paranasal sinuses producing secretions, in response to infections caused by viruses and bacteria. It also causes the deposition of these secretions because of inflammation. They also experience symptoms like nasal obstruction, nasal discharge, toothache, and headache. In the patients, nasal polyps showed inflammatory cell infiltration of eosinophils, replacing the pattern of neutrophil-dominant infiltration. Sometimes CRSwNP is also known as eosinophilic CRS (ECRS).¹ Inverted papilloma (IP), a type of benign tumor forms from the nasal cavity mucosa and in nasal sinuses, either in one or in multiple sites. Their transformation rate ranges from 5 to 15%, demanding the need for the surgery.² However, treatment can be accompanied along with chemotherapy or radiotherapy in the case of malignancy.

Case Presentation

A 56-year-old male patient was examined for ECRS using endoscopic sinus surgery (ESS) about 7 years back. Up on re-evaluation, he got aggravation of postnasal drip, thereby leading to the suspicion of ECRS recurrence or its regrowth. Initial tests were conducted, and an observed mass with irregularities was found in the posterior side of the right nasal cavity, whereas there were no changes in the left nasal cavity. Computed tomography (CT) and magnetic resonance imaging (MRI) scans were done, and they showed soft tissue spreading from the sinus to the nasopharynx and a cerebriform pattern during the MRI scan (Figure 1A-D). Multiple biopsies were done to examine inverted papilloma (IP), but there were no symptoms of lesions. It also showed an increase in the number of eosinophils, denoting the recurrence of ECRS. ESS was also done after 6 months, and the patient underwent surgical removal, histopathological analysis was done, and the results confirmed the presence of IP without any mortality (Figure 2). One year after the surgery, there were no signs of recurrence in the patient.

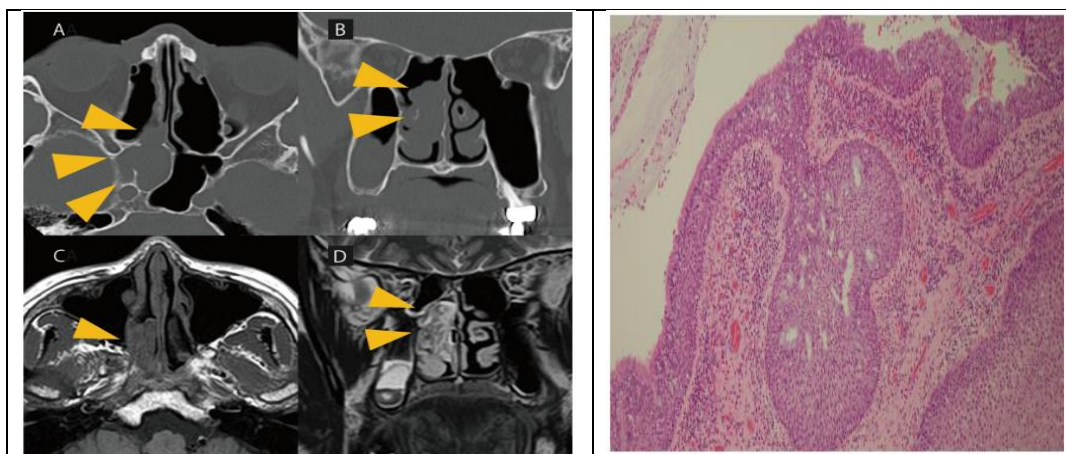


Figure 1: (A, B) Axial computed tomography (CT) of the paranasal sinuses; (C, D) Magnetic resonance imaging (MRI) of the sinuses. Yellow triangles indicate the tumor on both imaging modalities.

Figure 2: Histopathological findings of the surgical specimen

Discussion

In this case, a large amount of eosinophilic infiltration in outpatient biopsies indicated ECRS recurrence initially. The unilateral character of the lesion, focal surface abnormalities, and the difficulty in ruling out papillomatous patterns based on radiological results were some of the variables taken into consideration throughout the decision-making process. As a result, the lesion, including its base, was surgically removed and the postoperative phase went smoothly. At the one-year follow-up, there was no sign of tumor recurrence, despite the observation of minor granulation tissue six months after the intervention. Regular outpatient examinations were planned for the patient to enable early identification of any possible malignant change or recurrence.³ A study was conducted based on evaluating the recurrence rate of inverted papilloma and factors after endoscopic surgical resection, and the result proposes that nasal resection of IP by endoscopy was found to be a useful approach among all other challenges in surgery and also reduces their recurrence rate.²

Conclusion

This case highlights that even with multiple biopsies, the diagnosis result can be false negative due to sample site variability. Sometimes, eosinophilic infiltration in certain IP cases can lead to misdiagnosis if it depends on the findings of histopathology. This study gives novel insights into diagnostic challenges and emphasizes the significance of the intervention of surgery.

If histological evidence alone is used to diagnose IP, the presence of significant eosinophilic infiltration in certain cases may result in a misdiagnosis.

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