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.

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Looking forward to your valuable feedback
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Association between Inflammatory bowel disease and respiratory allergies: An analysis of Novel-perspectives for diagnosis and treatment

Introduction

IBD is a broad term for a group of long-term, nonspecific inflammatory gastrointestinal disorders, of which ulcerative colitis (UC) and Crohn's disease (CD) are the two main subgroups. Since it's a multifactorial disease, indicating that the immune system and environmental, genetic, or microbial variables interact intricately to cause the disease, the precise etiology is still unknown.[1] Atopic disorders, which include bronchial asthma, allergic rhinitis (AR), and atopic dermatitis (AD), are a group of illnesses that are strongly linked to allergic reactions. Studies have indicated that atopic disorders are influenced equally by immune response, genetic, environmental, and microbiological factors.[2] Despite being two different disorders, an increasing number of data suggests a connection between IBD and atopic disease. To better understand the relationship between IBD and respiratory allergens and to provide novel insights for improving patient diagnosis and therapy, this study employed Mendelian randomization analysis on GWAS data.[3]

Methods

In this 2 sample Mendelian randomization study, multiple single nucleotide polymorphisms (SNPs) representing genetic variation were analyzed as IVs. This study employed three hypotheses: instrumental variables (IVs) are directly and significantly correlated with exposure; they are not affected by confounding variables; and they only affect outcomes through exposure. MR analyses were conducted to evaluate the bidirectional causality between AR and IBD. The data were from the Integrative Epidemiology Unit (IEU) Open GWAS database (IEU GWAS). A total of 96,486 individuals were involved in this study, and only 90% of European data were included for analysis purposes. So, the research was carried out with 12,882 diagnosed with IBD, and 21,770 individuals as the control group (normal healthy volunteers). Analysis of CD (5956 cases and 14,927 controls) and UC (6968 cases and 20,464 controls) were also included. Another set of data obtained from the IEU GWAS database includes IBD (5673 cases, 213,119 controls), CD (2056 cases, 210,300 controls) UC (4320 cases, 210,300 controls), asthma (38,791 cases and 297,991 controls), AD (22,474 cases and 774,187 controls) were provided, and no cases of allergic rhinitis.

Results

In this study, Single Nucleotide Polymorphism (SNP) was used for screening the atopic diseases, 141 SNP for allergic rhinitis, 76 SNP for asthma, 61-63 SNP for atopic dermatitis (AD) and the findings indicated that AR raised the risk of Crohn's disease (CD) (IVW OR =

1.19, 95% CI = 1.02–1.39, P =0.026), ulcerative colitis (UC) (IVW OR = 1.14, 95% CI = 1.01–1.29, P =0.031), and overall IBD (IVW OR = 1.15, 95% CI = 1.03–1.28, P =0.015); Asthma raised the risk of CD (IVW OR = 7.66, 95% CI = 1.58–37.20, P =0.012), UC (IVW OR = 3.81, 95% CI = 1.09–13.32, P =0.036), and overall IBD (IVW OR = 5.13, 95% CI = 1.02–1.39, P =0.023); AD increased the risk of CD (IVW OR = 1.19, 95% CI = 1.02–1.39, P = 0.023) and overall IBD (IVW OR = 1.14, 95% CI = 1.03–1.28, P =0.015) (Table 1). Only CD raised the risk of AR in reverse causation (IVW OR = 1.02, 95% CI = 1.00–1.05, P =0.031).

Table 1: Effects between Atopic diseases and IBD (CD and UC) using inverse variance weighing method (Mendelian randomization)

Exposure	Outcome	nSNP	OR (Odd ratio)	95% CI	P value
AR	IBD	141	1.15	1.03–1.28	0.015
	CD	143	1.19	1.02–1.39	0.026
	UC	141	1.14	1.01–1.29	0.031
Asthma	IBD	76	5.13	1.48–17.70	0.010
	CD	76	7.66	1.58– 37.20	0.012
	UC	74	3.81	1.09– 13.32	0.036
AD	IBD	61	1.14	1.03–1.28	0.015
	CD	61	1.19	1.02–1.39	0.023
	UC	63	1.12	0.99–1.27	0.062

Discussion

People with IBD, especially those with UC and women, may be more likely to have asthma, according to a case-control study conducted in the Nordic region.[4] However, there was no elevated risk of asthma among IBD patients in this study, which might be because of variations in the study's design and geographic location, and the MR study also found a negative link between CD and asthma. Interestingly, IBD and AR are frequently linked, and previous studies have demonstrated that AR raises the risk of IBD.[5] According to this study, CD raises the risk of AR, but UC does not appear to raise the risk of AR. The findings that explain this difference could be linked to the distinct pathophysiology of these two subtypes.[3]

Conclusion

Both allergic rhinitis and asthma increase the risk of developing the inflammatory bowel disease and its categories. Furthermore, AD is connected to a higher risk of IBD, which may be related to CD. In a reverse causal relationship, CD raises the chance of AR. Physicians must recognize that patients with atopic diseases are more susceptible to IBD in order to ensure early diagnosis and start focused therapy.

Asthma and AR increase the likelihood of developing IBD and its subcategories, while AD elevates the risk of IBD, potentially due to CD.

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Assessment of clinical outcomes of specific Immunoglobin-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 nasosinusal 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).

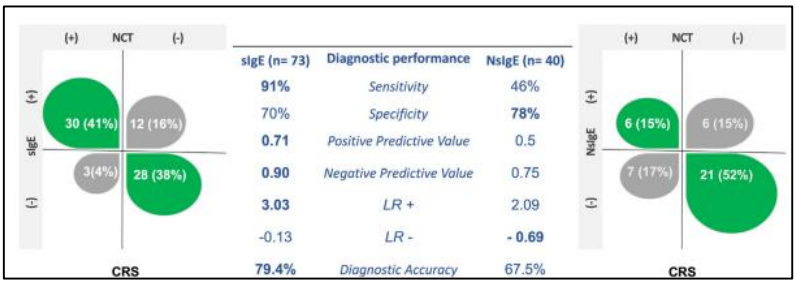

Figure 1: Diagnostic performance of patients based on NCT results for positive or negative SsIgE or NsIgE

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.

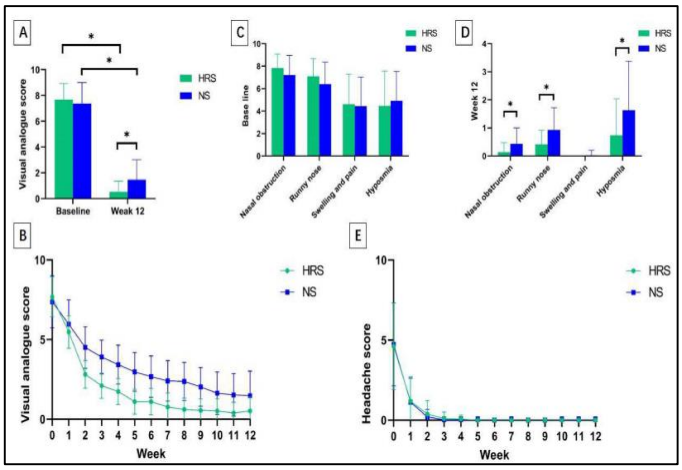

Figure 1: (A) The VAS score (baseline, week 12); (B) VAS weekly score; (C) VAS of the 4 nasal symptoms; (D) after 12 weeks (E) Headache score

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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An uncommon case of acute invasive fungal rhino sinusitis following a maxillary molar root canal in a diabetic patient

Introduction

Acute invasive fungal rhino sinusitis (AIFRS) is a rare and fatal condition where fungal organisms invade the mucosa, submucosa, and osseous structures of the paranasal sinuses. This invasive process can spread to the orbit and cerebral compartments, causing considerable morbidity and mortality.[1] Diabetes mellitus is a well-known risk factor for the development of AIFRS, owing to its compromised immunological responses. Individuals with poorly controlled diabetes are especially vulnerable to AIFRS caused by fungal diseases including Aspergillus and Mucormycosis species. AIFRS can be difficult to diagnose because of its non-specific symptoms, such as headaches, face pain, and edema, which can be mistaken for chronic rhinosinusitis.[2] Furthermore, dental operations, particularly oroantral communication, have been linked to the development of maxillary sinus mycetoma/fungal balls.[3] However, the association between dental work and invasive fungal sinusitis remains unclear. This was the first case of acute invasive fungal sinusitis following a maxillary molar root canal, which manifested as abrupt unilateral blindness.[4]

Case Presentation

A 69-year-old female patient with diabetes received a root canal procedure for a crown tooth #15. To manage pain and inflammation, she was prescribed to take drugs such as NSAIDs, clindamycin, and methylprednisolone. She started to feel pain and numbness on the left side of her face, particularly in V2 distribution, after a few days of the procedure. She believed that these were symptoms due to dental procedures and delayed pursuing medical care. Two weeks after the root canal procedure, the patient felt a reduction of vision in the left eye with ptosis and complete ophthalmoplegia. After this, she experienced complete vision loss in her left eye, describing it as a curtain falling over her vision. She was taken to the emergency room due to her symptoms, such as unilateral headaches and vision loss. The patient's initial lab results showed a markedly raised erythrocyte sedimentation rate of 130 mm/hr (normal <20 mm/hr) and C-reactive protein of 122.5 mg/L (normal <7.4 mg/L) indicative of a substantial inflammatory response. Furthermore, her HbA1c was noticeably higher at 13%, indicating poorly managed diabetes that had previously been controlled with diet. Magnetic resonance imaging (MRI) and computed tomography (CT) tests were conducted to determine the cause of her symptoms. From the test results, she was found to have left-sided sinusitis and started with antibiotics (IV), and in the MRI, rim-enhancing collection in the left pterygopalatine fossa and infratemporal fossa (Figure 1). The patient was treated with endoscopic sinus surgery (ESS) for sinuses, nasal cavity, and necrosis-related damage (Figure 2). Biopsies were also done on the paranasal sinus and on the oral cavity, found to have necrosis in the hard palate area near the operated tooth, and some areas were found to be negative for the attack of fungus.

Then, the patient was given 7 injections of retro bulbar amphotericin B, systemic liposomal amphotericin B, and caspofungin, and an additional 2 operative Sino-nasal debridement's. Post that, the patient was discharged with oral isavuconazole for long-term management. After 6 months, she recovered from light and shadow perception in her affected eye.

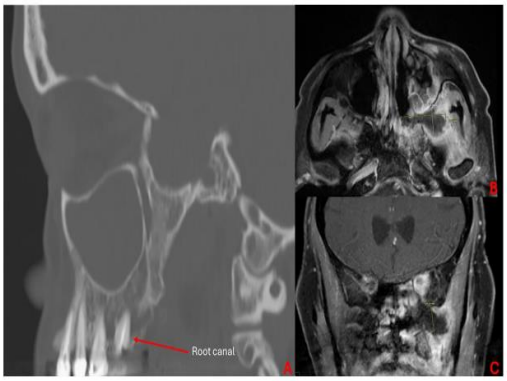

Figure 1: (A) CT of left maxillary sinus; (B) Axial and (C) coronal MRI of left pterygopalatine fossa extension into infratemporal fossa

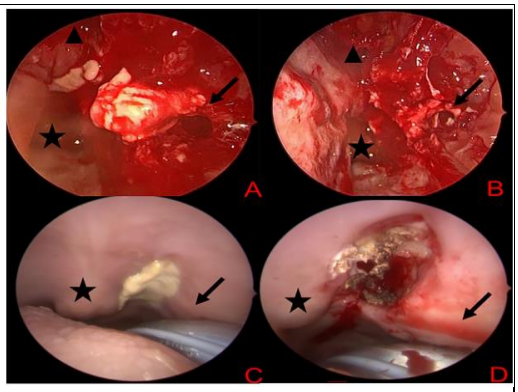

Figure 2: ESS of healthy mucosa aside from areas of necrosis adjacent to the location of the sphenopalatine foramen and within the maxillary sinuses

Discussion

This was the first documented AIFRS case report among uncontrolled diabetic patients after a root canal procedure. In this case, the patient was given antifungal therapy such as amphotericin B and ESS to remove the infected tissue.[4] A similar study found that amphotericin B (retro-bulbar) injection decreased the surgical removal of dead tissue from the cavity in the patients without causing mortality in mucormycosis patients.[5] In this case, amphotericin injections were used rather than exenteration, which was found to be effective.

Conclusion

AIFRS is an uncontrollable infection that causes more morbidity and mortality in patients. This case highlights the significance of early diagnosis and management of fungal sinusitis in diabetic patients. This case focuses on the importance of clinical vigilance with poor immune patients, diabetic ones who experience symptoms like facial pain and ocular-related problems after their dental procedure.

Sometimes dental procedures may lead to unexpected infections, early prediction and proper treatment are essential in managing the outcome of fungal rhino-sinusitis, in uncontrolled diabetes.

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