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. **Comparison of the levels of biochemical Allergic markers and other parameters in People with and Without Allergic Rhinitis**
2. **Analysis of Leukotriene Antagonists in Reducing Seizure-Related Hospitalizations in Older Adults with Allergic Rhinitis or Asthma**
3. **Relationship between the Dietary Inflammatory Index and the risk of Allergic Rhinitis**
4. **Case Report on Isolated Neutrophilic Urticarial Dermatosis**

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback
Best Regards,
Medical Team, Micro Labs Ltd

Comparison of the levels of biochemical Allergic markers and other parameters in People with and Without Allergic Rhinitis

Introduction

Allergic rhinitis (AR) is a significant global health concern, affecting 10-20% of the population, with rising prevalence.[1] AR is caused by immunoglobulin E (IgE)-mediated reactions to inhaled allergens where it is characterized by sneezing, nasal congestion, nasal itching and rhinorrhoea (nasal discharge).[2] AR is diagnosed using clinical allergy symptoms and diagnostic assays such skin testing and serum-specific IgE levels. The economic burden is substantial, with indirect costs often underestimated. Several studies have shown that there was alternation in number of biochemical parameters and inflammatory mediators in AR.[1] So, this study was conducted to examine the levels of biochemical markers (periostin, pendrin/SLC26A4, vitamin D, anti-TPO, and eosinophilic cationic protein) in patients with AR, non-allergic rhinitis (n-AR), AR with lower respiratory tract symptoms (AR-SLRT), and a healthy control group.

Methods

The case control study involved 81 participants, divided into four groups: AR (22 patients), n-AR (20 patients), AR-SLRT (21 patients), and a control group of healthy individuals (18 participants). Blood samples were collected from all participants to measure the levels of total IgE, eosinophils, periostin, pendrin, vitamin D, eosinophilic cationic protein (ECP), and thyroid markers (Free T3, Free T4, TSH, and anti-TPO antibodies) as well as the leukocyte formula and hemogram. These biomarkers were compared across the different groups to identify any significant differences.

Results

The AR-SLRT group had the highest total IgE levels, followed by the AR group, while the n-AR and control groups had significantly lower IgE levels. Eosinophil counts were elevated in both AR and AR-SLRT groups, but not in the n-AR or control groups (Figure 1). Periostin and pendrin levels showed no significant differences among the groups. Vitamin D levels were uniformly low across all groups, including the controls. Thyroid markers did not exhibit any

significant variation across the AR, n-AR, AR-SLRT, and control groups. Hematocrit, platelet count, and monocyte count varied significantly between groups.

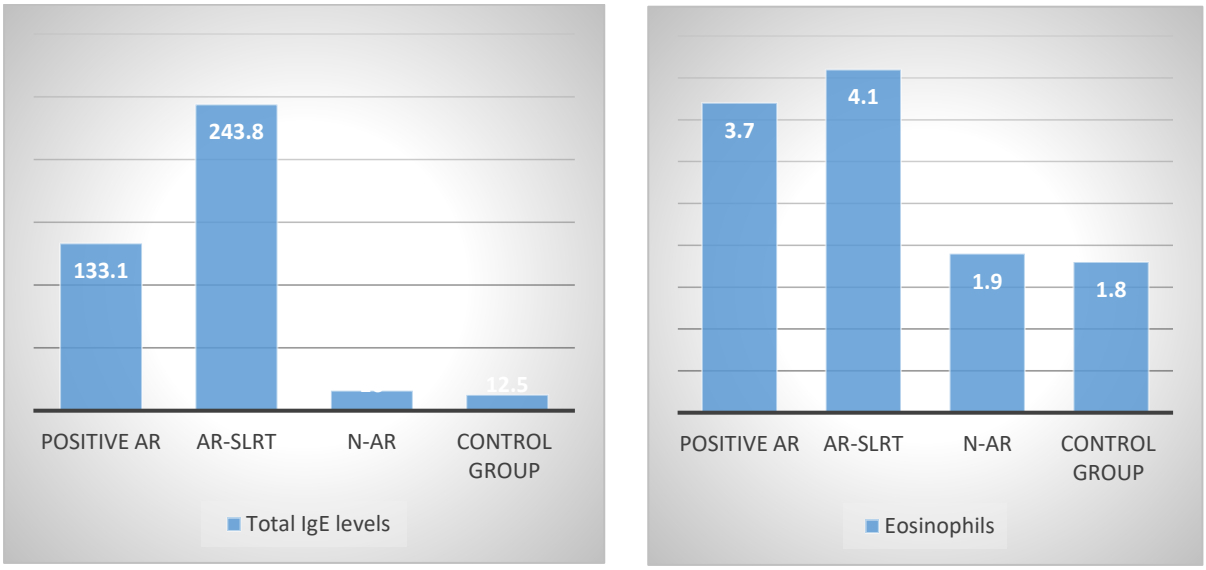

Figure 1. Percentage of Total IgE levels and Eosinophils according to study groups

Discussion

The study confirmed that total IgE and eosinophil counts are valuable markers for distinguishing allergic rhinitis, especially in cases with lower respiratory tract involvement. However, periostin and pendrin did not play a significant role in differentiating between allergic and non-allergic rhinitis. The widespread deficiency of vitamin D across all groups suggests that it was not a distinguishing factor between AR and n-AR. Thyroid markers also appeared unrelated to rhinitis conditions in this study.[1] Similar results were reported by a study which showed that mean values of serum log IgE and eosinophil levels were higher in AR patients compared to healthy controls.[3]

Conclusion

The groups with positive AR and AR-SLRT had higher eosinophil counts than the control group and the group with AR-SLRT had higher total IgE concentrations than the other groups.

Eosinophilic count and Total IgE levels are higher in case of Allergic rhinitis.

References

1. Selmonaj Rama M, Tahirbegolli B, Sopjani M. Hematological, Biochemical, and Serum Levels of Allergic Mediators in Individuals with and without Allergic Rhinitis. J Asthma Allergy. 2024 Jun 4;17:539-549.

2. Bousquet J, Anto JM, Bachert C, Baiardini I, Bosnic-Anticevich S, Walter Canonica G, Melén E, Palomares O, Scadding GK, Togias A, Toppila-Salmi S. Allergic rhinitis. Nat Rev Dis Primers. 2020 Dec 3;6(1):95.
3. Sharma M, Khaitan T, Raman S, Jain R, Kabiraj A. Determination of serum IgE and eosinophils as a diagnostic indicator in allergic rhinitis. Indian J Otolaryngol Head Neck Surg. 2019;71:1957–1961.

Analysis of Leukotriene Antagonists in Reducing Seizure-Related Hospitalizations in Older Adults with Allergic Rhinitis or Asthma

Introduction

Epilepsy is a multi-factorial neuronal disorder. The abnormal jerky or quivering movements that epileptic seizures cause in the body are caused by abnormal neuronal activity and can cause harm to the brain or other parts of the body.[1] Older adults are more susceptible to epileptic seizures compared to other age groups. Data from Medicare administrative claims in the United States show that 2.4 out of every 1000 person-years among older persons experience epileptic seizures. Previous studies have shown that Leukotriene receptor antagonists (LTRAs) may exert an antiepileptic effect by suppressing inflammation in many diseases, including those of the central nervous system. But few population-based etiological studies on this topic have been available.[2] So, this study aimed to explore whether LTRAs reduce hospitalization risk associated with epileptic seizures in older individuals with asthma or allergic rhinitis.

Methods

This large population-based cohort study included all individuals aged 60-89 years who had at least one episode of allergic rhinitis or asthma during the study period. Further, this study compared individuals who newly started LTRAs with those who did not take LTRAs. Primary outcomes were time to hospital admission associated with an epileptic seizure and secondary outcome was the time to occurrence of an epileptic seizure, regardless of hospitalization.

Results

A total of 64724 patients were included for final analysis which had both LTRA-exposed vs unexposed groups. Following matching, there were 182 patients exposed to LTRAs (0.78/1000 person-years) and 308 patients unexposed to LTRAs (1.04/1000 person-years) who required hospital admissions for epileptic seizures and the Hazard ratios (HRs) was 0.75. Upon matching, 909 patients exposed to LTRAs (3.9/1000 person-year) had all new-onset epileptic seizures, compared to 1233 unexposed patients (1233/294891: 4.2/1000 person-year) and the HR was 0.96 in patients with epileptic seizures without relationship with hospitalization (Figure 1).

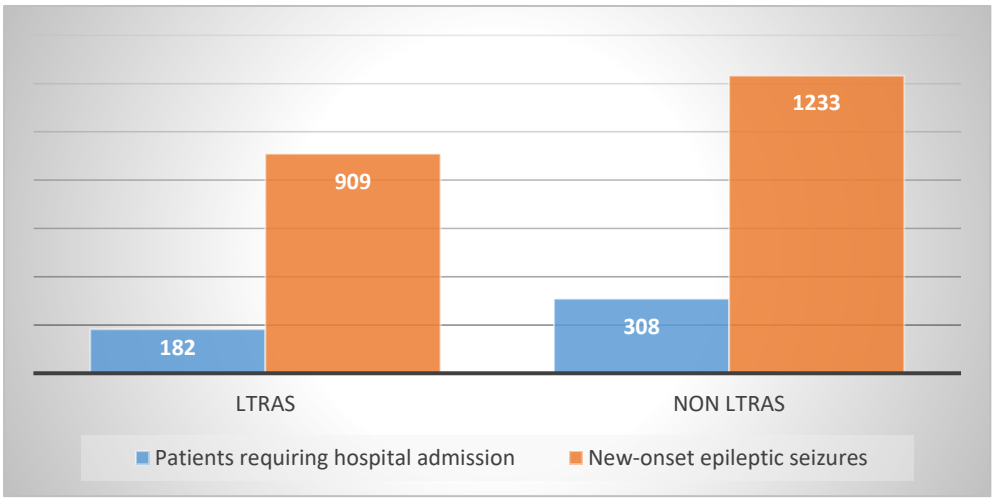

Figure 1. Results of proportion of patients requiring hospital admission and new onset epileptic seizures

Discussion

This study showed that LTRAs significantly reduced epileptic seizure-related hospitalization, but all forms of epileptic seizures were not suppressed by LTRAs. Previous reports have stated that LTRAs which bind to the leukotriene receptor were used to treat asthma and seasonal allergies, have been identified as a potential alternative treatment for epilepsy. LTRAs have anti-inflammatory effect which maintain the integrity of the blood-brain barrier (BBB) and incidence of epileptic seizures were reduced due to neuroprotective and antioxidant properties.[2] Previous study results align with the present study showing in patients with severe epileptic seizures, the LTRA pranlukast suppressed seizures in two-thirds of patients.[3]

Conclusion

Leukotriene receptor antagonists reduced risk of seizure-related hospitalization in older adult patients with allergic rhinitis or asthma other than those with diabetes.

Leukotriene receptor antagonists have neuroprotective and antioxidant properties which reduce the incidence of epileptic seizures.

References

1. Anwar H, Khan QU, Nadeem N, Pervaiz I, et al. Epileptic seizures. Discoveries (Craiova). 2020 Jun 12;8(2):e110.
2. Imaichi Y, Nakatani E, Fukutomi Y, Kuriyama N, et al. Leukotriene antagonists reduce epileptic seizures-related hospitalization in older adult populations with allergic rhinitis or asthma: A population-based cohort study using the Shizuoka Kokuho database: The Shizuoka study. Epilepsia Open. 2024 Feb;9(1):200-209.
3. Takahashi Y, Imai K, Ikeda H, Kubota Y, et al. Open study of pranlukast add-on therapy in intractable partial epilepsy. Brain Dev. 2013;35:236–44.

Relationship between the Dietary Inflammatory Index and the risk of Allergic Rhinitis

Introduction

Allergic Rhinitis (AR) is a prevalent chronic inflammatory condition driven by an Immunoglobulin E (IgE)-mediated hypersensitivity to allergens, leading to symptoms such as nasal itching, sneezing, congestion, rhinorrhoea, and ocular discomfort.[1] The global prevalence of AR affects 20-40% of the population, with high rates in the US, Canada, and increasing in China. The condition significantly impacts quality of life, disrupting daily activities and sleep. Lifestyle factors, especially diet, may influence AR progression, with dietary patterns potentially modulating inflammatory responses.[2] However, there is a scarce of studies on the association between the Dietary Inflammatory Index (DII) and the risk of AR. So, this study aimed to investigate the association between the Dietary Inflammatory Index (DII) and AR risk, focusing on how dietary patterns might affect the condition.

Methods

This case-control study included 332 participants, with 166 diagnosed with AR and 166 matched controls. Dietary intake was assessed using a Food Frequency Questionnaire (FFQ), and Energy-adjusted DII (E-DII) scores were calculated based on intake of various food parameters associated with inflammation. Participants were matched by age and gender. Covariates like age, gender, BMI, and lifestyle factors were collected through interviews. Statistical analyses involved comparing E-DII scores between cases and controls and assessing the association between E-DII and AR risk using logistic regression models.

Results

AR patients had significantly higher E-DII scores (0.36 ± 1.82) compared to controls (-0.91 ± 1.44), indicating a more pro-inflammatory diet. The highest E-DII tertile was associated with a 4.41-fold increased risk of AR compared to the lowest tertile. The study found that higher E-DII scores correlated with higher intakes of pro-inflammatory nutrients (total fat, saturated fatty acids (SFA), polyunsaturated fatty acids (PUFAs) and lower intakes of anti-inflammatory nutrients (fiber, vitamins, minerals) (Figure 1). The association between E-DII and AR risk was consistent across different AR types, durations, severities, and onset timings.

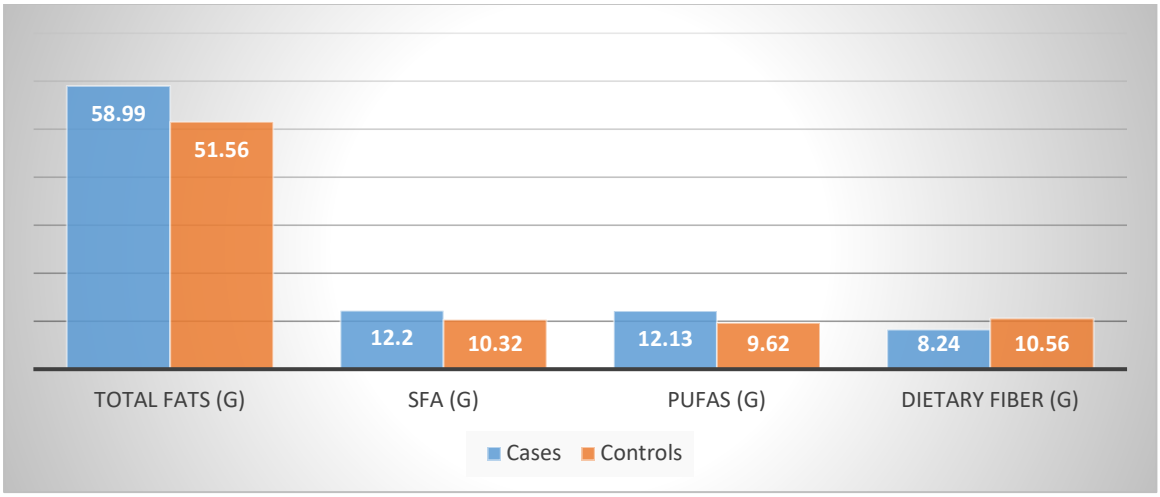

Figure 1. Proportion of dietary intake in the study participants

Discussion

This study highlighted the novel finding that higher dietary inflammatory potential, as indicated by elevated E-DII scores, was associated with an increased risk of AR.[2] The findings are consistent with other studies which indicates a positive correlation between a high DII score and an increased risk of AR, with a risk ratio reaching 2.23.[3] A diet high in total fat, SFA, and n-6 PUFAs was linked to increased AR risk, while higher intake of anti-inflammatory nutrients was associated with reduced risk. This supported the hypothesis that diet plays a significant role in AR pathogenesis through modulation of inflammatory processes. The results aligned with previous research suggesting that both specific nutrients and overall dietary patterns impact inflammatory responses.[2]

Conclusion

Higher E-DII scores, reflecting a more pro-inflammatory diet, were associated with an increased risk of AR. This suggested that dietary modifications could be a viable strategy for managing or preventing AR.

A diet with lower inflammatory potential may help reduce the risk of allergic rhinitis.

References

1. Bousquet J, Anto JM, Bachert C, Baiardini I, et al. Allergic rhinitis. Nat Rev Dis Primers. 2020 Dec 3;6(1):95.
2. Wang Q, Dong N, Feng Y, Ning Y, et al. The association between the dietary inflammatory index and allergic rhinitis: a case-control study. Front Nutr. 2024 Jun 27;11:1418305.
3. Oh HY, Lee S-Y, Yoon J, Cho H-J, et al. Vegetable dietary pattern may protect mild and persistent allergic rhinitis phenotype depending on genetic risk in school children. Pediatr Allergy Immunol. 2020; 31:920–9.

Case Report on Isolated Neutrophilic Urticarial Dermatosis

Introduction

Neutrophilic dermatoses (NDs) are a group of inflammatory skin conditions which is characterized by a neutrophilic infiltrate on histopathology without any indication of infection. ND are classified based upon the localization of neutrophils within the skin and clinical features.[1] It includes conditions such as sweet syndrome, pyoderma gangrenosum, and Sneddon-Wilkinson disease. These disorders share features like sterile neutrophil accumulation and systemic inflammatory associations. Distinguishing between these conditions can be challenging due to overlapping symptoms and histopathological findings. Neutrophilic urticarial dermatosis (NUD) is a distinct ND marked by leukocytoclasia and neutrophilic infiltration without dermal edema or vasculitis.[2] This case report described an atypical presentation of NUD with minimal systemic manifestations.

Case Presentation

A 45-year-old male with glucose-6-phosphate dehydrogenase (G6PD) deficiency presented with fever, night sweats, and upper respiratory symptoms, followed by migratory arthralgia and low back pain. Over two months, he experienced weight loss and developed a diffuse, itchy erythematous rash (Figure 1). The rash was accompanied by eye redness and itching, but no significant findings were noted on ophthalmological examination. The patient had a history of recurrent oral ulcers but no genital ulcers or Raynaud's phenomenon. Physical examination revealed normal vital signs and a diffuse erythematous rash. Joint pain was reported in multiple areas, including the proximal interphalangeal joints (PIPs), wrists, elbows, and knees. Laboratory tests, including CBC, kidney and liver function tests, and viral screenings, were normal. A CT scan showed no abnormalities. Skin biopsy revealed neutrophilic spongiosis, leukocytoclasia in the papillary dermis, and a peri-adnexal neutrophilic infiltrate without vessel wall necrosis (Figure 2), confirming NUD. The patient was treated with colchicine (0.5 mg every 12 hours) and prednisolone (10 mg). Due to persistent symptoms and limited response, colchicine was increased to 0.5 mg every eight hours. Dapsone was avoided due to G6PD deficiency. Follow-up after one week and one month showed significant improvement (Figure 2). The patient was advised to attend regular check-ups every six months post-resolution.

Figure 1. Images showing itchy erythematous rash at initial presentation

Figure 2. Images showing Improvement in itchy erythematous rash

Discussion

NUD is a specific type of neutrophilic dermatosis with distinct clinical and histopathological features. It presented with pale or red patches that resolve quickly, and its differentiation from conditions like sweet syndrome and urticarial vasculitis was crucial. NUD differs from typical urticaria in its lack of response to antihistamines and specific histological features. Systemic symptoms may be linked to underlying disorders but were not always present. The pathophysiology involves innate immune dysregulation, and treatment responses vary.[2] Medications inhibiting neutrophil migration, like colchicine and dapsone have shown beneficial effect. IL-1 antagonists including anakinra, have shown potential effects in cases related to CAPS.[3]

Conclusion

NUD can occur without prominent systemic disease, as demonstrated in this case. Accurate diagnosis and differentiation from other skin conditions were essential for effective management. Although treatment responses can vary, understanding the disorder and tailoring treatment approaches can lead to successful outcomes.

Accurate diagnosis of neutrophilic urticarial dermatosis is crucial for effective management and treatment of this rare condition.

References

1. Delaleu J, Lepelletier C, Calugareanu A, De Masson A, et al. Neutrophilic dermatoses. La Revue de Médecine Interne. 2022 Dec 1;43(12):727-38.
2. Alshiyab D, Ba-Shammakh SA, Al-Fakih AA. Isolated Neutrophilic Urticarial Dermatosis in a Previously Healthy Male: A Case Report. Cureus. 2024 May 6;16(5):e59750.
3. Weiss EH, Ko CJ, Leung TH, et al. Neutrophilic dermatoses: a clinical update. Curr Dermatol Rep. 2022; 11:89-102.