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. **Evaluation of relationship between dietary antioxidant intakes and chronic respiratory diseases in adult population**
2. **Assessment of aeroallergen sensitization in allergic rhinitis patients unresponsive to medical therapies**
3. **Evaluation of relationship between serum immunoglobulin E level and eosinophil Count among Patients with Allergic Rhinitis**
4. **Case report on pollen food allergy syndrome**

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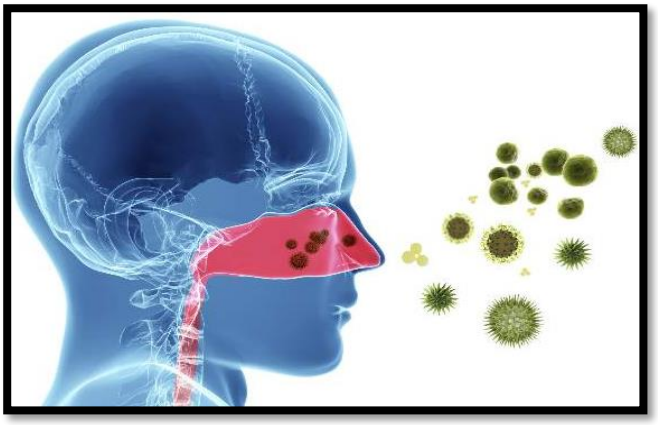
Looking forward to your valuable feedback
Best Regards,
Medical Team, Micro Labs Ltd

Evaluation of relationship between dietary antioxidant intakes and chronic respiratory diseases in adult population

Introduction



Chronic respiratory diseases (CRDs) refers to a group of diseases which significantly affect lung function and overall respiratory health, including emphysema, chronic bronchitis, and asthma. Multiple factors, including environmental exposures such as air pollution, smoking, occupational hazards, and genetic predispositions affect the development of CRDs.[1] Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2017 found that close to 545 million people in the world had a chronic respiratory disease in 2017, an increase of 39·8% since 1990.[2] Epidemiological research suggested that, dietary factors like antioxidants may be extremely important for managing and preventing CRDs.[1] Hence this study aimed to investigate the potential protective role of dietary antioxidants against CRDs in adults.

Methods

This study evaluated the relationship between dietary antioxidant intakes and CRDs by using data from National Health and Nutrition Examination Survey (NHANES). A total of 40557 participants were included for analysis. Composite dietary antioxidant index (CDAI) was used for calculating the whole antioxidant amount found in a person's diet. Information were collected on dietary antioxidant intakes, including vitamins A, C, and E, zinc, selenium, and carotenoids. Multivariate logistic regression was used to investigate the relationship between CDAI and CRDs.

Results

This study results showed that approximately 481.00 (270.00, 785.00) mg/day, 51.50 (21.50, 111.60) mg/day, 6.58 (4.29, 9.91) mg/day, 9.93 (6.89, 14.08) mg/day, 99.60 (70.10, 136.80) mg/day, and 5344.00 (2002.00, 12162.00) mg/day, were the average intake of vitamins A, C, and E, and zinc, selenium, and carotenoids. Spearman correlation values revealed an Individual dietary antioxidant micronutrients and CDAI were shown to have significant associations ($r > 0.55$). There was a significant relationship found between serum zinc and serum arsenic. CDAI scores and the frequency of CRDs had a negative connection in all models. Those with CDAI scores in the fourth quartile showed a 19% lower prevalence than those in the first quartile after adjusting for all variables. After controlling for all confounders, there was a negative correlation established between the prevalence of emphysema and chronic bronchitis in fourth quartile of CDAI as compared to the first quartile. Restricted cubic spline (RCS) regression

model showed non-linear negative connection (P for nonlinearity <0.01) between CDAI and the occurrence of CRDs, with a 3.20 inflection point. This non-linear connection (P for nonlinearity <0.01) was present with an inflection point of 4.33, between the prevalence of chronic bronchitis and CDAI. Negative linear association between CDAI and the prevalence of emphysema was found (P for nonlinearity = 0.89) (Figure 1).

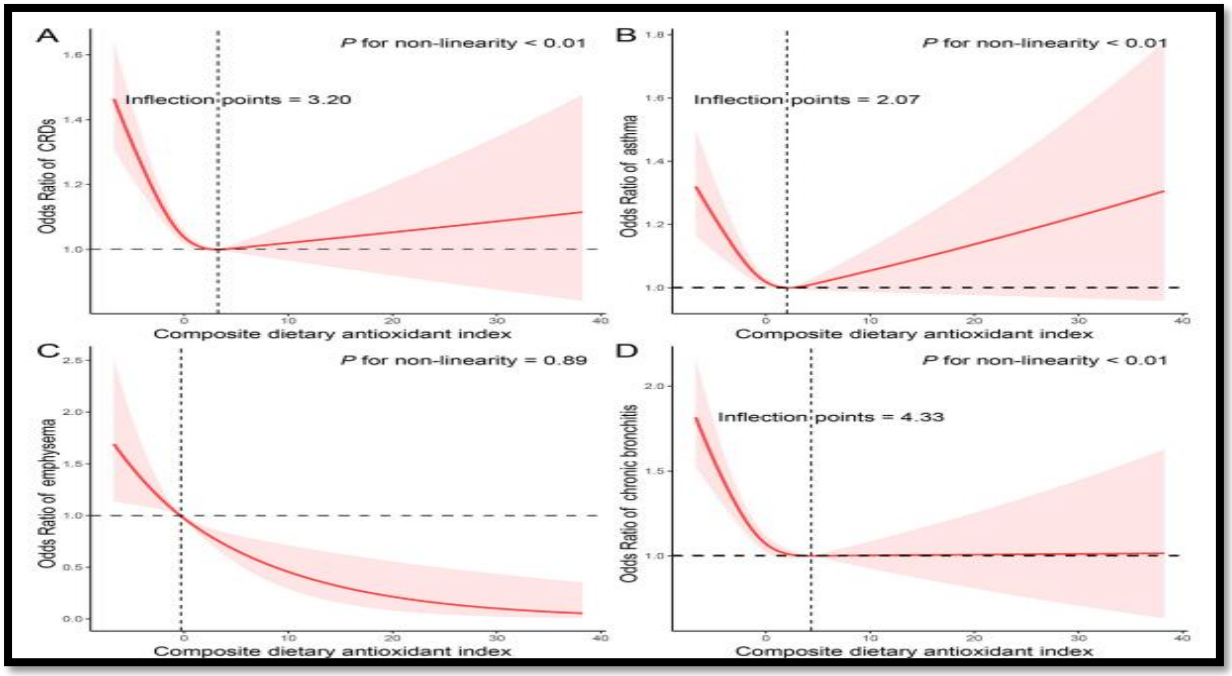


Figure 1. Restricted cubic spline showing association of the CDAI with the prevalence of CRDs

Discussion

According to the study results, the prevalence of CRDs was 19% lower among those with CDAI scores in the fourth quartile than in the first. The incidence of emphysema and chronic bronchitis was negatively correlated with CDAI throughout the 3 CRDs that were studied; however, there was no significant association with asthma. CDAI was used as an indicator to quantify total dietary antioxidant intake. Antioxidant-rich foods have a positive effect on preventing progression of chronic diseases by neutralizing free radicals and reducing oxidative stress. This results were similar as higher total dietary antioxidant intake exhibited a lower prevalence of emphysema and chronic bronchitis. Previous study reported that increased consumption of antioxidants in the diet can reduce the incidence of respiratory disorders.[3] Vitamins A, C, and E were known for their potent antioxidant properties and immune-boosting effects which play a role in safeguarding the respiratory tract from inflammation which was caused by asthma and COPD.[4]

Conclusion

CDAI was found to be negatively associated with the prevalence of CRDs particularly emphysema and chronic bronchitis in the adult population. This study results highlighted the importance of antioxidant rich food in lung function and onset of CRD.

Higher dietary antioxidant intakes were related with a lower prevalence of Chronic respiratory diseases in general adults.

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Assessment of aeroallergen sensitization in allergic rhinitis patients unresponsive to medical therapies

Introduction

Allergic rhinitis (AR) is caused by immunoglobulin E (IgE)-mediated reactions to inhaled allergens and is characterized by sneezing, nasal congestion, nasal itching and rhinorrhoea (nasal discharge).[1] In recent years, 20% of the population worldwide have experienced one kind of atopic diseases. In the past decade, there has been a significant correlation between climate change and a number of risk factors for allergic respiratory disorders, such as indoor pollutants, aeroallergens, and environmental exposure to air pollutants and bio-particulates. The main objective of therapy for allergic rhinitis is symptom relief.[2] This study aimed to identify the relevant aeroallergen sensitization and effectively manage the refractory signs and symptoms of allergic rhinitis in patients who were not responding to pharmacological therapy.

Methods

A total of 62 patients with refractory allergic rhinitis were included in this study. Allergic rhinitis was defined based on the presence of sensitization to environmental allergens and according to ARIA (Allergic rhinitis and its impact on asthma) guidelines. Following enrolment, information on the patients socio-demographic data, concomitant allergic diseases, comorbidities, and clinical history of the rhinitis were collected.

Results

In this study, 62.9% of the patients were female. The mean age of all patients was 33.9 years. The most prevalent aeroallergens were weeds (69.4%) and trees (64.5%) in these patients. Among individuals with allergic rhinitis who did not respond to standard medical treatments, outdoor allergens were more common than indoor allergens.

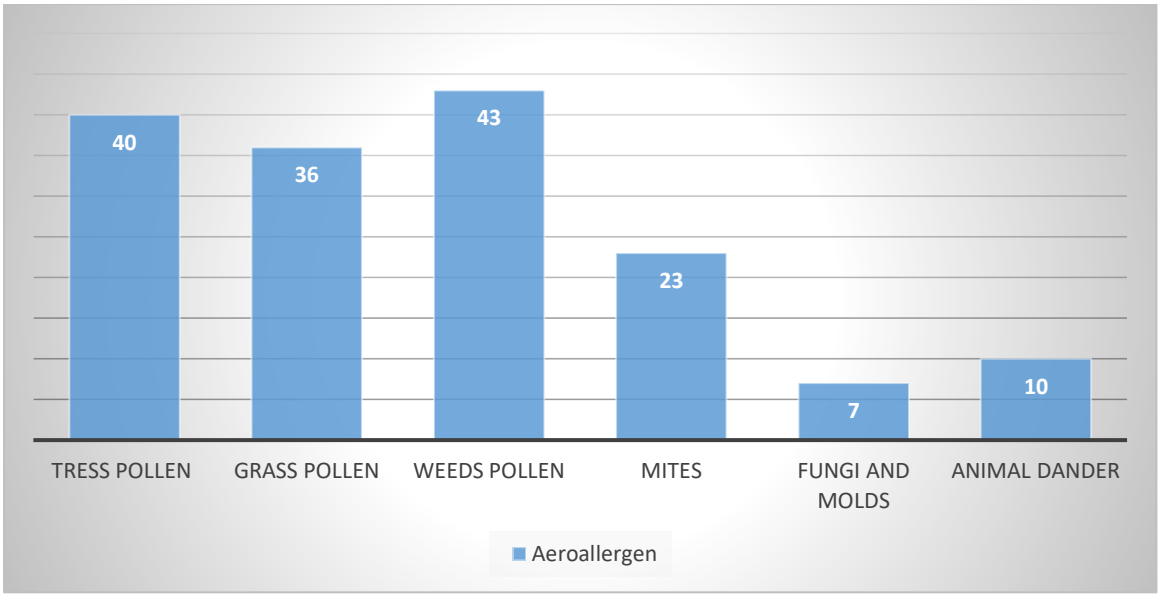

Figure 1. Results of Skin prick test in patients with allergic rhinitis

Discussion

As one of the most common allergies in the world, allergic rhinitis can usually be treated with medicine but patient response to therapy varies. This study results showed outdoor aeroallergens were more common than indoor ones. Furthermore, among the population in study, weeds and mites were the most prevalent indoor and outdoor aeroallergens, respectively. Weeds (69.4%) and trees (64.5%) were the most frequent aeroallergens in these individuals, respectively.[2] A recent study stated that in recent decades weed pollen allergy has increased and it was the prevalent cause of pollinosis worldwide.[3]

Conclusion

Outdoor allergens more commonly weeds were the common cause for severe refractory allergic rhinitis than indoor allergens. Therefore, for significant improvement and positive outcome individualized treatment should be provided in accordance to their allergen sensitization.

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Evaluation of relationship between serum immunoglobulin E level and eosinophil Count among Patients with Allergic Rhinitis

Introduction

Serum IgE level can be useful in diagnostic assessment of patients with and at risk of allergic rhinitis

Allergic rhinitis (AR) is caused by type 1 hypersensitivity reaction that the nasal mucosa undergoes in reaction to aeroallergens, such as animal dander, house dust mites, and grass and tree pollens, causes allergic rhinitis. The primary signs and symptoms are paroxysmal sneezing, pruritus, watery rhinorrhea, and nasal congestion.[1] Allergic rhinitis affects up to 40% of the population and its prevalence is increasing. Serum IgE plays an important role in the pathophysiology of allergy. It has been found that eosinophils are involved in allergies. According to reports, one of the characteristics of allergic diseases was the infiltration of the tissues with a higher concentration of eosinophils. This study aimed to evaluate serum IgE level and its relationship with eosinophils count among patients with AR.

Methods

This was a cross-sectional study comprising of individuals diagnosed with AR. 61 patients were included in this study. Five millilitres of blood were examined using a pack five hematologic auto-analyzer to determine the eosinophil count and an immunoglobulin E ELISA kit to estimate immunoglobulin E.

Results

All patients had mean ages of 38.65 ± 14.34 years, serum IgE levels of 371.24 ± 82.63 IU/ml, and eosinophil counts of 3.35 ± 2.87%, respectively. 11.47% of patients had elevated eosinophil counts, 88.53% had normal eosinophil counts. Of the subjects, 11 (18.0%) had mild AR. Their mean ± SD for IgE and eosinophil was 367.60 ± 97.46 and 2.62 ± 1.99, respectively. 22 (36.1%) had moderate AR, with mean ± SD IgE and eosinophil values of 365.06 ± 93.01 and 3.05 ± 2.77, while 28 (45.9%) had severe AR, with mean ± SD IgE and eosinophil values of 377.51 ± 69.63 and 3.87 ± 3.20. It was found that there was no significant correlation between the serum IgE level and eosinophil counts (Figure 1).

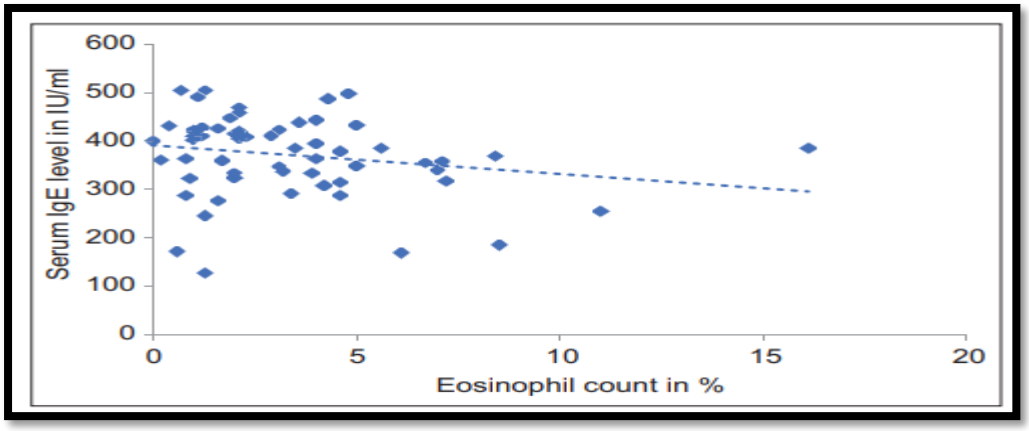

Figure 1. Graph illustrating the relationship between serum IgE level in IU/ml and eosinophil count in %

Discussion

Results of this study showed that serum IgE level was raised in all (100%) of the participants. This results were correlated with the results of Choudhari et al. where serum IgE was found raised in 100% of patients with AR.[3] This indicated a strong correlation between elevated blood IgE levels and AR and can be an important investigation in this disorder. Raised serum IgE level were found in all forms of AR. Only 11.5% of the participants in the study had higher eosinophil counts while, the remaining 88.5% had normal counts. According to Mirza et al. eosinophil count may be elevated in acute AR, however it might not be a useful diagnostic test for AR patients.[4] The study found a negative, insignificant correlation between the eosinophil count and the serum IgE level. This study confirmed the significance of serum IgE level as a marker of AR, and as such, clinical practice will benefit from the estimation of this level for the purpose of diagnosing patients who have or are at risk for AR.

Conclusion

High serum IgE level were found in all the participants. It was found that there was no significant association between serum IgE and eosinophil count.

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Case report on pollen food allergy syndrome

Introduction

This case report supports the relationship between sensitization to mold aeroallergens and allergy to edible fungi ingestion

Patients with pollinosis may have pollen-food allergy syndrome (PFAS), an immunoglobulin E (IgE)-mediated acute allergic response that develops after consuming fruits, vegetables, or nuts that exhibit cross-reactivity with pollens.[1] Mold allergies range from 6–24% in the general population and are responsible for the majority of fungal allergies. Similarly, mushrooms can rarely cause anaphylaxis. The pollen/fruit/vegetable cross-reactivity observed in pollen food allergy syndrome (PFAS) was similar to cross-reactivity. Various pollens and food have been demonstrated cross reactivity.[2] This case reported a young male experiencing symptoms of PFAS following mushroom ingestion.

Case Presentation

A 15 years old male patient with the history of mild atopic dermatitis, peanut, and tree nut allergy was previously diagnosed via skin prick testing (SPT). Patient had seasonal and perennial allergic rhino conjunctivitis. Skin prick testing was positive to grass, ragweed, Botrytis cinerea, Cephalosporium gramineum, and Aureobasidium pullulans and was prescribed with ciclesonide nasal spray 50 mcg 1 spray twice daily to each nostril. In later weeks, patient ingested a pizza with fresh mushrooms (Agaricus bisporus), and experienced immediate throat pruritis and subjective throat tightness. For Alternaria alternata (3.56 kU/l), Cladosporium herbarum (2.28 kU/l), and Penicillium notatum (19.45 kU/l), the ImmunoCap serum specific IgE (from Phadia Laboratory Systems) tested positive; a positive test was defined as ≥0.35 kU/l. Specific IgE to the whole mushroom (Agaricus hortensis) in the ImmunoCap serum was negative, with total IgE measuring 764 kU/l. Brown cremini mushrooms (4 mm wheal), white cremini mushrooms (6 mm wheal), and portobello mushrooms (5 mm wheal) all tested positive on a subsequent SPT performed on fresh mushrooms. In response to these findings, the patient underwent a 5-step, graded oral challenge including canned mushrooms in order to reach a total of 3 g of mushroom protein, as specified by the ingredient label. Patient overcame the test without experiencing any systemic signs typical of anaphylaxis, such as oral pruritis. Finally, patient was advised to avoid consumption of raw or undercooked mushrooms as a precautionary measure.

Figure 1. Results of skin prick test to Portobello mushroom (PO), White Cremini mushroom (W), Brown Cremini mushroom (Br), and canned mushroom (CM) with appropriate positive histamine (+) and negative saline (−) control

Discussion

This case described a patient with a history of allergic rhinitis to microfungi aeroallergens who developed PFAS like reaction with mushroom ingestion. When patients pass the oral challenge with canned mushrooms and the raw mushroom skin test comes back positive, it was suggested that there may be a heat-labile protein response. This was similar to when PFAS patients can tolerate cooked fruit and vegetables but not raw ones. Positive SPT and IgE to well-known spore forming fungi and edible fungi of the phyla Basidiomycetes (Agaricus bisporus) and Ascomycetes (Cladosporium herbarum, Alternaria alternata, Penicillium notatum, Botrytis, Cephalosporium, and Pullaria) indicated that there may be cross-reactivity between these species that results in sensitisation and PFAS-like response upon intake.[2] A similar case report described PFAS with uncooked mushroom in a patient allergic to molds. Results showed a cross-reactivity between raw heat labile mushroom proteins of 43 kilodaltons (kD) and 67 kD and molds Horodendrum cladosporioides, Alternaria tenuis, Fusarium vasinfectum, and Helminthosporium interseminatum.[3]

Conclusion

This case report highlighted the potential cross-reactivity between microfungi aeroallergens and edible fungi, leading to PFAS-like reactions in susceptible individuals.

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