Dear Doctor,

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

This issue contains:

1. **Investigation of the predictive and diagnostic factors for perennial allergic rhinitis onset in children**
2. **Assessment of specific bronchial symptoms in asthma diagnosis and their control in patients with rhinitis**
3. **Evaluation of efficacy and safety of intratonsillar immunotherapy in allergic rhinitis**
4. **Case report on Pott's Puffy Tumor in a Patient with Eosinophilic Chronic Rhinosinusitis**

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

Investigation of the predictive and diagnostic factors for perennial allergic rhinitis onset in children

Introduction

Nasal eosinophilia and HDM sensitization were the known risk factors for development of AR.

Allergic rhinitis (AR) is an allergen-specific IgE-mediated type 2 allergic condition which has reported increasing prevalence in children.[1] AR affects around 10–40% of the population globally. Symptoms includes itching, nasal congestion, paroxysmal sneezing, and rhinorrhea.[2] Perennial allergic rhinitis (PAR) is a chronic condition characterized by persistent nasal symptoms. It significantly impacts the quality of life, especially in children. Identification of symptoms of allergic rhinitis in children has become more difficult. Due to this reason, Chiba High-risk Birth Cohort for Allergy (CHIBA) study was conducted on children with family history of allergy.[1] This study aimed to confirm the hypothesis and investigate the predictive and diagnostic factors for PAR onset in children.

Methods

This prospective birth cohort study was conducted on newborns with the family history of allergies. A total of 306 pregnant women at 36 weeks of gestation were included. Allergy histories of the parents and siblings was collected using questionnaire. Study participants were examined at 1, 2, and 5 years of age by pediatric allergists. Participants with clinical and laboratory data were considered. Statistical analyses were performed to evaluate results.

Results

Out of 306 participants, 187 were included for final analysis. Rates of sensitization to house dust mites (HDM) at 1, 2, and 5 years of age were 7.5%, 23.5%, and 51.9%. PAR was diagnosed in 4 (2.1%), 8 (4.3%), and 45 (24.1%) participants developed PAR at 1, 2, and 5 years of age. Japanese cedar pollen (JCP) sensitization rates at 1, 2, and 5 years of age were 0%, 4.3%, and 44.4%, respectively. Participants were divided into four groups, group 1 includes nasal symptoms (-) and HDM sensitization (-) participants, group 2, nasal symptoms (+) and HDM sensitization (-); group 3, nasal symptoms (-) and HDM-sensitization (+); and group 4, nasal symptoms (+) and HDM sensitization (+). The group 4 participants were considered to have developed PAR. At 2 and 5 years of age, positive nasal findings were significantly higher in group 4 than 1, 2, and 3. Presence of nasal eosinophilia at 2 years of age was higher in group 4 than others (Figure 1). In 187 cases, the sensitivity and specificity of HDM sensitization were found to be 55.6% and 86.6%, respectively. Sensitivity and specificity of nasal eosinophil appearance were 55.6% and 75.4%. The sensitivity and specificity were 42.2% and 98.5% on combining HDM sensitization and nasal eosinophilia.

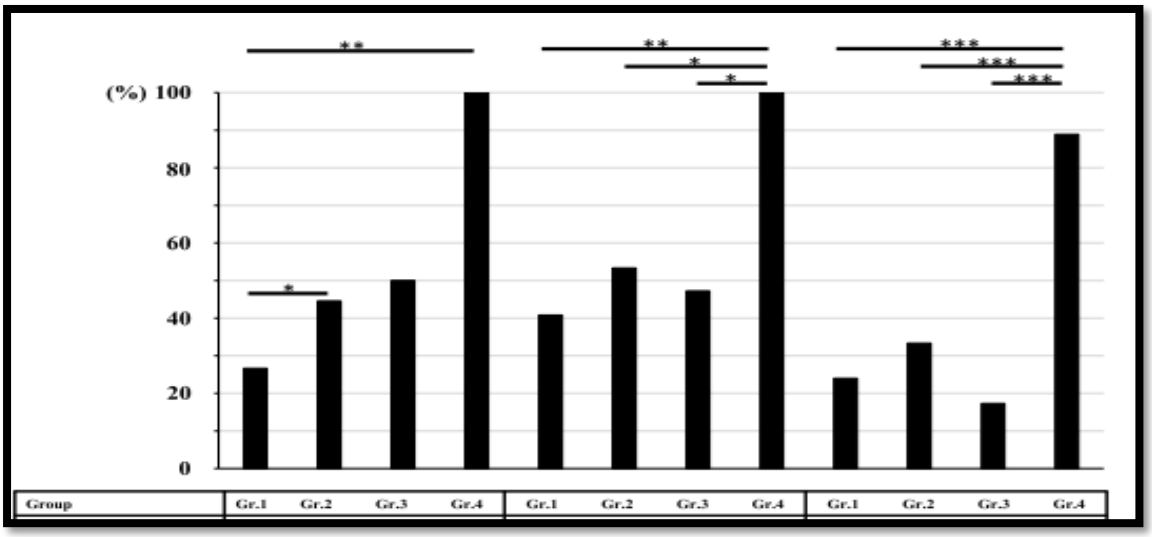

Figure 1. Diagnosis of rhinitis in different group of patients

Discussion

This study finding confirmed that PAR developed in children aged ≤5 years and that sensitization to HDM as well as nasal eosinophilia were the factors associated with future onset of PAR.[1] In a previous large global survey prevalence of asthma was 8.5% (1.8%-20.4%) in children aged 6-7 years and 14.6% (1.4%-33.3%) among children aged 13-14 years.[3] Further many epidemiological surveys showed a rising trend in AR. It was found that nasal eosinophilia may aid in the diagnosis when PAR is suspected. Appearance of nasal eosinophilia was found to be a known risk factor for the subsequent development of PAR. Positive sensitization is also a known risk factor for the subsequent development of AR. Considering both presence or absence of nasal eosinophilia and HDM sensitization at 2 years of age may predict PAR development at 5 years of age.[1]

Conclusion

For pediatric PAR, nasal eosinophilia and signs of rhinitis are useful diagnostic elements. In terms of future PAR onset, sensitization to HDM and nasal eosinophilia were the most significant factors. The prediction of PAR onset may be aided by a combination of these factors.

References

1. Yonekura S et al. Factors contributing to the diagnosis and onset prediction of perennial allergic rhinitis in high-risk children: A sub-analysis of the CHIBA study. Allergol Int. 2024 Jul;73(3):436-444.
2. Jo HR, Sung WS, Jung CY, Lim CY et al. Effectiveness and safety of electric heating moxibustion for perennial allergic rhinitis: A pilot, randomized, assessor-blind trial. Complement Ther Med. 2022 Sep;68:102835.
3. Aït-Khaled N, Pearce N, Anderson HR, Ellwood P, Montefort S, Shah J, et al. Global map of the prevalence of symptoms of rhinoconjunctivitis in children: the International Study of Asthma and Allergies in Childhood (ISAAC) phase three. Allergy. 2009;64:123e48.

Assessment of specific bronchial symptoms in asthma diagnosis and their control in patients with rhinitis

Introduction

Wheezing and chest tightness were the symptoms of asthma having highest specificity for asthma diagnosis

Asthma is a defined as a chronic inflammatory disease of the airways which leads to cough, wheeze, shortness of breath, and chest tightness. Symptoms of asthma are caused by the inflammation of the airways, which triggers processes such as mucus production, remodeling of the airway wall, and bronchial hyperresponsiveness (BHR).[1] Many patients with asthma are insufficiently monitored and exhibit poor adherence to treatment. These factors contribute to poor asthma control, increased risk of asthma attacks, and higher healthcare utilization. Patient-centered digital solutions, including mHealth apps, can potentially address some of these issues by collecting real-world data on asthma symptoms and treatment. The MASK-air (Mobile Airways Sentinel networK) app, which includes validated patient-reported outcome measures (PROMs) like the Control of Allergic Rhinitis and Asthma Test (CARAT) questionnaire, is one such solution.[2] This study aimed to assess how individual asthma symptoms (wheezing, dyspnea, chest tightness) are associated with both asthma diagnosis and control using MASK-air PROMs data.

Methods

This cross-sectional study utilized MASK-air data to compare the frequency of five asthma symptoms (dyspnea, wheezing, chest tightness, fatigue, and night symptoms) in patients with probable asthma, possible asthma, and no evidence of asthma as assessed by CARAT. This study included patients who were diagnosed with asthma. The MASK-air app includes daily monitoring questionnaires and the CARAT questionnaire, assessing the impact of asthma and rhinitis symptoms, and the daily use of medication.

Results

This study included 951 patients with rhinitis, with 468 classified as having probable asthma, 166 with possible asthma, and 317 with no evidence of asthma. There were 2154 CARAT assessments, with 302 indicating controlled CARAT and 1852 indicating uncontrolled complete CARAT. When comparing patients with “no evidence of asthma” versus those with “probable or possible asthma”, wheezing had the highest specificity (90.5%) and positive predictive value (PPV) (90.8%) for asthma diagnosis. Dyspnea had the highest sensitivity (63%). Similar patterns were observed when all CARAT assessments were considered. When comparing patients with “probable asthma” versus those with “possible asthma” specificity decreased from chest tightness (79.5%) and wheezing (77.7%) to dyspnea (64.5%) and fatigue and night symptoms (50%). Dyspnea had the highest sensitivity (76.1%). The PPV ranged from 77.9% to 88.9%. In the Twinning project sample (283 participants), wheezing again showed the highest specificity (86.0%) and PPV (70.5%), while dyspnea had the highest sensitivity (76.3%) and negative predictive value (NPV) (85.6%) (Figure 1). Dyspnea was most strongly

associated with the e-DASTHMA levels, indicating its significance in asthma control assessment.

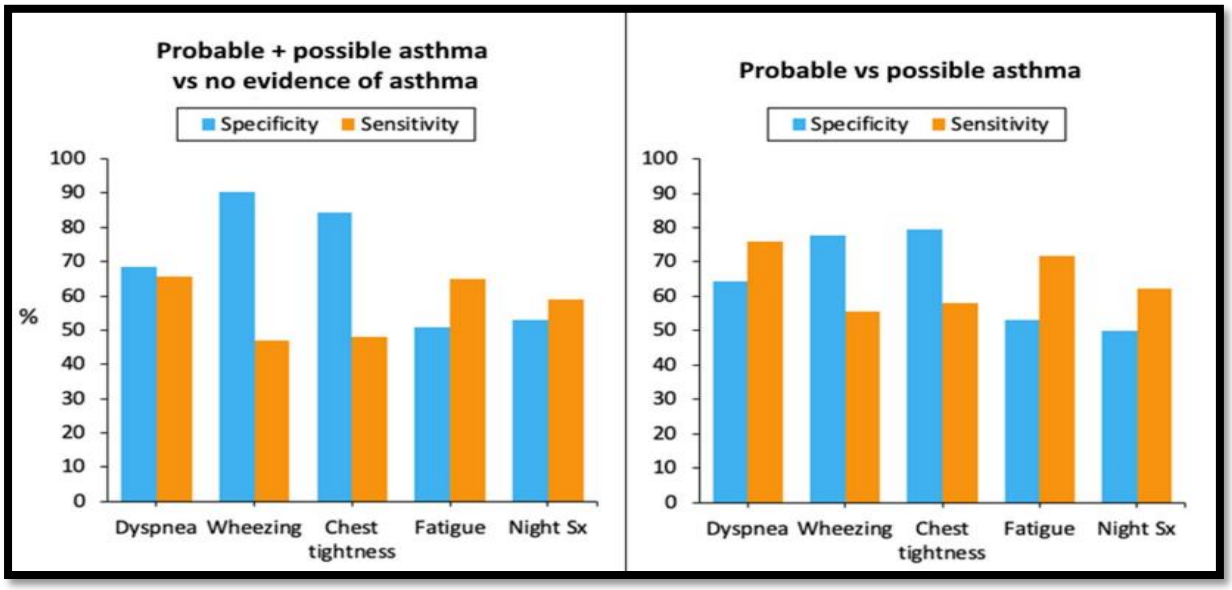

Figure 1. Sensitivity and specificity value in specific asthma symptoms

Discussion

This study was the first to assess individual asthma symptoms for the diagnosis and control of the disease. The study highlights wheezing and chest tightness as significant predictors of asthma diagnosis, with wheezing displaying the highest specificity and PPV.[2] These findings align with previous research indicating wheezing as a crucial symptom for asthma diagnosis.[3] However, dyspnea was the most sensitive symptom for asthma control, corroborating previous studies that found dyspnea to be a key indicator of asthma control and quality of life.

Conclusion

Among patients with rhinitis, wheezing and chest tightness were the most specific symptoms for predicting asthma diagnosis, while dyspnea was the most sensitive symptom for assessing asthma control.

References

1. Hammad H, Lambrecht BN. The basic immunology of asthma. Cell. 2021 Mar 18;184(6):1469-1485.
2. Sousa-Pinto B, Louis G, Vieira RJ, Czarlewski W, et al. Relevance of individual bronchial symptoms for asthma diagnosis and control in patients with rhinitis: A MASK-air study. Clin Transl Allergy. 2024 Jun;14(6): e12358.
3. Louis G, Schleich F, Louis R, et al. How respiratory symptoms impact asthma-related quality of life in mild asthmatics. Respir Med. 2023;207:107098.

Evaluation of efficacy and safety of intratonsillar immunotherapy in allergic rhinitis

Introduction

Intratonsillar injection with House dust mite extract was safe and effective in patients with allergic rhinitis

Allergic rhinitis (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).[1] Allergic rhinitis (AR) is a global health issue that significantly affects patients' quality of life. House dust mite (HDM) is a primary allergen causing AR, with approximately 88.9% of AR patients. Allergen-specific immunotherapy (AIT) is the only curative treatment for allergic diseases, inducing tolerance, modifying the disease's natural course, and reducing the risk of further sensitization. Intralymphatic immunotherapy (ILIT) has shown promise for quicker tolerance induction, but it involves complex procedures and potential severe adverse effects. Given the tonsils role in immune tolerance and their accessibility, this study proposes a novel intratonsillar injection immunotherapy (ITIT) route for HDM-induced AR.[2] This study aimed to evaluate efficacy and safety of the intratonsillar injection of house dust mite (HDM) extract in patients with HDM-induced allergic rhinitis (AR).

Methods

This was a investigator-initiated, randomized, double-blind, placebo-controlled trial conducted to evaluate ITIT's efficacy and safety with HDM extract in HDM-induced AR patients. About 80 participants were randomized 1:1 to receive 6 intratonsillar injections of HDM or placebo over three months. Outcomes were assessed at 3, 6, and 12 months post-treatment. Inclusion criteria included aged 18-55 with a history of moderate-to-severe AR, a total nasal symptom score (TNSS) ≥6 and positive HDM sensitivity tests. Primary endpoints were TNSS and change in TNSS (ΔTNSS). Secondary endpoints included visual analogue scale (VAS) scores, combined symptom and medication score (CSMS), and MiniRQLQ.

Results

About 80 patients were enrolled, with 35 in each group completing the study. The TNSS in the active group significantly improved compared with that in the placebo group at 3 months after the treatment was finished. This improvement was not significant at 6 and 12 months, though trends favored the active group. At 3, 6, and 12 months following the end of therapy, the percentage of improved cases in the placebo group was 31.43%, 42.86%, and 37.14%, while the active group had 65.71%, 51.43%, and 57.14% of improved cases at those same intervals (Figure 1). The P values were very close to the significant level, and the number of cases in the active group that improved at more than or equal to two or three visits after the therapy was completed was higher than that of the placebo group (60% and 37.14%, 34.29% and 14.29%).VAS scores, CSMS, and MiniRQLQ showed significant improvements at 3 months in the active group compared to placebo. The Der p-specific IgG4 levels increased significantly

in the active group at all post-treatment assessments ($P < 0.01$). The most frequent AEs were mild local reactions, such as sore throat and throat irritation, which resolved without medical intervention. No severe systemic reactions were observed.

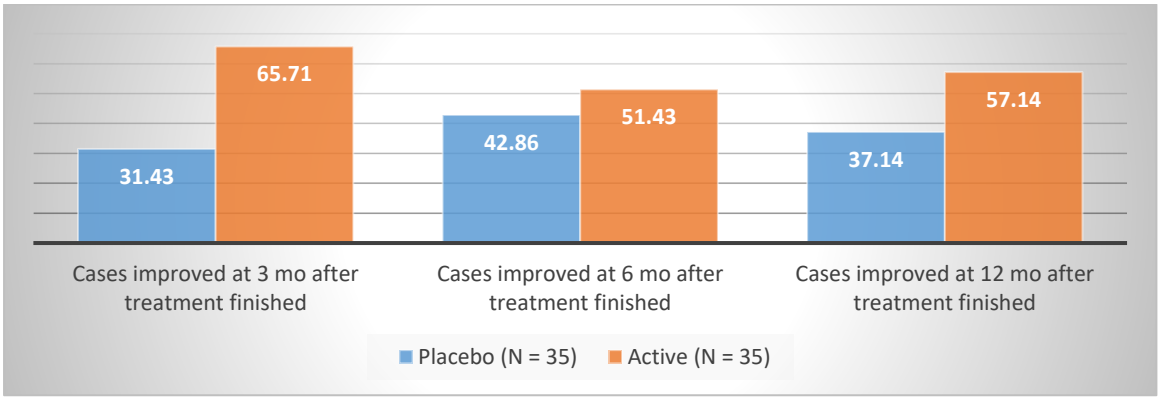

Figure 1. Overall improvement after treatment in per-protocol set

Discussion

In this study, when compared to patients receiving a placebo, the primary end points, TNSS and ΔTNSS, improved significantly (more than 20%) 3 months after patients with AR completed a 3-month, 6 -injection ITIT. At 3, 6, and 12 months following the completion of the treatment, the secondary end points, like the VAS score, CSMS, and quality of life, altered in the same way as the TNSS and ΔTNSS.[2] As previous study has reported that tonsils may serve as powerful inductive sites for immune responses such as immunologic memory and antibody induction.[3] Hence in this study, Intratonsillar allergen injections were found to be safe and tolerated well in this study. HDM intratonsillar injection didn't not cause allergic symptoms such as urticaria and angioedema, which was reported in intralymphatic allergen injections. However, this study was an evidence that intratonsillar injection may be a potential and safe AIT route for AR based on the current results.[2]

Conclusion

Intratonsillar injection with HDM extract was safe and effective in patients with AR. Improving the protocol and allergen formulations is expected to increase and maintain the efficacy of this novel approach.

References

1. 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. Nature Reviews Disease Primers. 2020 Dec 3;6(1):95.
2. Zhang J, Yang X, Chen G, Hu J, et al. Efficacy and safety of intratonsillar immunotherapy for allergic rhinitis: A randomized, double-blind, placebo-controlled clinical trial. Ann Allergy Asthma Immunol. 2024 Mar;132(3):346-354.e1.
3. Quiding-Jarbrink M, Granstrom G, Nordstrom I, Holmgren J, Czerkinsky C. Induction of compartmentalized B-cell responses in human tonsils. Infect Immun. 1995;63(3):853–857

Case report on Pott's Puffy Tumor in a Patient with Eosinophilic Chronic Rhinosinusitis

Introduction

Endoscopic sinus surgery was considered in this case based on the possibility of relapse of Pott's puffy tumor.

Pott's puffy tumor (PPT) is rare but a severe complication of frontal sinusitis. Clinical feature is predominantly characterized by the development of frontal osteomyelitis accompanied by a subperiosteal abscess.[1] Headache, periorbital edema, fever, vomiting, periorbital swelling, fever, lethargy, purulent rhinorrhoea, and signs of meningitis or encephalitis were the most common symptoms. PPT can be seen in all age groups but has higher incidence among adolescents.[2] Eosinophilic chronic rhinosinusitis (ECRS), a sub type of chronic rhinosinusitis, which is characterized by extensive nasal polyp formation and marked eosinophilic infiltration within the sinus tissue. Current management strategies include surgical interventions with both local and systemic corticosteroid therapies.[1] This case report aimed to describe the diagnostic and treatment complexities involved in treating a patient who presents with PPT in the setting of ECRS that has been complicated by prior cranial vault surgery.

Case presentation

A 56 years old female patient presented with the complaints of loss of smell and nasal obstruction. Patient was managed conservatively but later on, swelling and redness on her forehead was developed, and symptoms worsened. On physical examination clear consciousness, erythema, pain, and swelling of the frontal skin without neck rigidity were found. Nasal sinus endoscopy showed presence of polyp in the bilateral middle meatuses. Patient had a past medical history of craniotomy, clipping surgery for a cerebral aneurysm approximately 30 years prior, and bronchial asthma. Patient underwent plain paranasal CT scan revealed significant swelling from the opening to the surrounding subcutaneous area of the frontal sinus, with a frontal bone defect and osteolysis at the base of the frontal skull. From the above reports initial diagnosis was suspected as PPT due to an osteolytic lesion, contiguous extracranial abscess formation, and a history of cranial surgery. ECRS was also suspected due to intranasal findings and a history of bronchial asthma. The forehead abscess was drained using an ultrasound-guided incision, and pus was collected for culture. Following surgery patient was treated with antibiotics such as ampicillin/sulbactam (ABPC/SBT), ceftriaxone (CTRX). Patient underwent Bilateral endoscopic sinus surgery (ESS) after 12 days of admission and treated with 10 mg of prednisolone (PSL) for seven days to minimize the nasal polyps and bleeding. Nasal polyps were removed, and the bilateral pan-sinus cavities were drained. On the 14th day, Intranasal packing was removed, while nasal lavage was commenced soon after. Patient was discharged on the 19th day, and advised oral cephalexin (CEX) for 16 days and advised for continued outpatient monitoring.

Discussion

This study finding showed that PPT typically arises from the propagation of infection through the interosseous veins, resulting in frontal sinus osteomyelitis and subsequent subperiosteal abscess formation. In the present case, patient's previous surgery, potentially involving non-biodegradable materials such as bone wax, likely exacerbated local inflammatory responses, resulted for the development of PPT. The diagnostic approach for PPT includes CT and MRI to assess the extent of sinusitis and detect any intracranial complications.[1] In past management of PPT was done through craniotomy, but now ESS has been increasingly favored for minimally invasive cases that present with no intracranial complications.[3] ESS is most frequent treatment option for ECRS. ESS was considered as there was a potential risk for relapse of PPT due to bone thickening and the possibility of inadequate efficacy of antibody treatments.

Conclusion

This case report highlighted that endoscopic sinus surgery can be considered as a treatment option and also illustrated the importance of integrating patient history and current clinical indicators to guide treatment planning and execution.

References

1. Tatsuki S, Tsuda T, Takeda K, Obata S, Inohara H. A Case of Pott's Puffy Tumor in a Patient With Eosinophilic Chronic Rhinosinusitis. Cureus. 2024 May 23;16(5):e60893.
2. Junior LS, Medeiros MN, Gadelha LD, Neri WJ, Cavalcanti MA. Pott's Puffy Tumor-Overview of case series. Jornal Memorial da Medicina. 2021 Sep 14;3(1):10-7.
3. Junior LS, Medeiros MN, Gadelha Ld, Neri WJ, Cavalcanti MA: Pott's Puffy Tumor-Overview of case series . J Mem Med. 2021, 3:10-7