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Integrated physician-Nursing and radiological Approaches in Managing Adult Patients with Combined Allergic Rhinitis and Asthma Syndrome (CARAS)

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Abstract:

Combined Allergic Rhinitis and Asthma Syndrome (CARAS) represents a major clinical challenge due to the interconnected nature of upper and lower airway diseases. Traditional management often isolates allergic rhinitis and asthma treatment, leading to fragmented and inefficient care. This review emphasizes the necessity of an integrated approach involving physicians, nurses, and radiologists to ensure comprehensive diagnosis, effective management, and improved outcomes for adult patients with CARAS. By combining clinical expertise, patient education, and advanced imaging techniques, healthcare systems can achieve better disease control, enhance quality of life for patients, and reduce healthcare costs. The review elaborates on the specific contributions of each discipline and proposes an integrated care model that highlights interprofessional collaboration.

Introduction:

Combined Allergic Rhinitis and Asthma Syndrome (CARAS) embodies the "one airway, one disease" concept, where both allergic rhinitis and asthma co-exist as manifestations of a unified inflammatory process affecting the respiratory tract. Allergic rhinitis is characterized by sneezing, nasal congestion, rhinorrhea, nasal itching, and ocular symptoms such as itchy, watery eyes, while asthma presents with hallmark respiratory symptoms like wheezing, dyspnea, chest tightness, and chronic cough. These diseases share common pathophysiological pathways, including eosinophilic inflammation, elevated IgE levels, and Th2-dominant immune responses, underpinning their frequent coexistence. Epidemiological studies reveal a strong link between the two conditions, suggesting that up to 80% of individuals with asthma also experience allergic rhinitis, and conversely, allergic rhinitis is a significant risk factor for the development and worsening of asthma [1,2,3]. CARAS imposes a significant burden on patients' daily lives, sleep quality,

productivity, and psychological well-being, while also increasing the risk for severe asthma exacerbations, hospitalization, and impaired quality of life [4]. Despite these strong pathophysiological and epidemiological connections, healthcare delivery models have historically treated allergic rhinitis and asthma as discrete entities, leading to missed opportunities for synergistic management and optimal patient care. An integrated approach, incorporating physician-directed clinical management, nurse-led education and patient support, and radiologist-assisted imaging evaluation, can bridge these gaps. This model ensures early and accurate diagnosis, personalized treatment strategies, patient empowerment, and close monitoring for complications, ultimately improving disease outcomes and patient satisfaction [5,6]. Furthermore, multidisciplinary collaboration fosters a holistic, patient-centered approach that aligns with the Chronic Care Model and other contemporary frameworks for managing chronic disease. The importance of multidisciplinary collaboration is increasingly recognized in the management of chronic diseases, and applying these principles to CARAS is both timely and necessary to address the complex interplay between upper and lower airway pathology. This review will explore the individual and synergistic roles of physicians, nurses, and radiologists in the management of CARAS, emphasizing how integrated teamwork can improve patient-centered outcomes, reduce healthcare costs, and support sustainable chronic care systems in diverse healthcare settings.

Review:

Role of the Physician:

The physician plays a foundational and central role in the integrated care pathway for CARAS, serving as the leader in diagnosis, therapeutic decision-making, and overall care coordination. Upon initial presentation, the physician conducts a comprehensive clinical evaluation, beginning with a detailed history aimed at identifying symptom patterns, allergen exposures, comorbid conditions, environmental influences, and previous responses to therapy. Particular attention must be paid to temporal associations between allergen exposure and symptom onset, nocturnal symptom patterns, exercise-induced respiratory symptoms, and seasonal variations, as these nuances can guide differential diagnosis and management. Physical examination is meticulous and includes inspection of the nasal mucosa for edema, pallor, erythema, and polyps; auscultation of the lungs to detect wheezes, rales, or diminished breath sounds; and assessment of the oropharynx and eyes for signs of allergic conjunctivitis or postnasal drip. To support clinical impressions, physicians employ diagnostic tools such as spirometry to assess baseline and bronchodilator-reversible airflow obstruction, peak expiratory flow rate (PEFR) monitoring, skin prick testing, serum-specific IgE quantification, and measurement of exhaled nitric oxide (FeNO) to detect eosinophilic airway inflammation [7,8,9]. Importantly, the physician must recognize when radiological evaluation is necessary to uncover underlying anatomical factors or complications contributing to refractory symptoms, particularly when sinonasal disease is suspected. Management plans are tailored to the individual patient and typically involve prescribing pharmacologic therapies such as intranasal corticosteroids, second-generation antihistamines, leukotriene receptor antagonists, inhaled corticosteroids, and long-acting beta-agonists. Physicians are also responsible for patient education, encouraging environmental modifications to reduce allergen exposure, and setting realistic expectations for disease control. Most critically, physicians coordinate with nurses and radiologists to ensure a unified and consistent approach to patient care, participating actively in multidisciplinary discussions and follow-up planning.

Role of the Nurse:

Nurses are indispensable pillars of integrated CARAS management, bridging the gap between clinical interventions and real-world patient outcomes through their close and continuous engagement with patients. After the physician establishes a diagnosis and initial management plan, the nurse takes an active role in patient education, medication administration support, and care coordination. Comprehensive patient education provided by nurses covers a wide range of topics, including understanding the pathophysiology of CARAS, recognizing early warning signs of exacerbations, appropriate allergen avoidance strategies, and stepwise management plans for acute symptom control [12]. Nurses conduct inhaler technique training sessions, often using placebo devices for demonstration, ensuring that patients are competent in using metered-dose inhalers, dry powder inhalers, and nasal sprays—an intervention known to significantly impact asthma and rhinitis control [13]. Beyond educational responsibilities, nurses administer and interpret standardized tools such as the Asthma Control Test (ACT) and Sino-Nasal Outcome Test (SNOT-22) during routine follow-ups to objectively monitor disease status and identify early deterioration [14]. Care coordination activities managed by nurses include scheduling timely follow-up appointments, monitoring medication adherence, triaging acute complaints, and facilitating referrals to physicians or radiologists when complications are suspected. Their role extends into psychosocial support as well, empowering patients through motivational interviewing and self-management strategies. By fostering long-term therapeutic relationships and offering continuity of care, nurses significantly enhance treatment adherence, reduce preventable hospitalizations, and promote sustained improvements in quality of life [15]. In the multidisciplinary model, nurses serve as the linchpin connecting patients to the broader healthcare team, advocating for patient needs and contributing to dynamic care plan adjustments based on evolving clinical status.

Role of the Radiologist:

The role of the radiologist within the integrated management of CARAS is both diagnostic and consultative, providing critical imaging information that informs clinical decision-making and uncovers complications not easily identifiable through clinical evaluation alone. Radiologists contribute their expertise predominantly through advanced imaging modalities such as high-resolution computed tomography (HRCT) scans of the paranasal sinuses and chest radiography. HRCT of the sinuses is invaluable in detecting sinonasal abnormalities, including mucosal thickening, sinus opacification, ostiomeatal complex obstruction, and nasal polyps, all of which are common contributors to persistent upper airway symptoms in CARAS patients [16,17]. Accurate identification of these findings supports clinical decisions regarding escalation of medical therapy or consideration of surgical intervention such as functional endoscopic sinus surgery (FESS). In addition, chest radiographs play a key role in ruling out alternative diagnoses, including infectious pneumonia, bronchiectasis, and pulmonary masses, especially when patients exhibit refractory lower airway symptoms [11]. In selected cases, particularly those with suspected invasive fungal sinusitis or orbital/intracranial extension, magnetic resonance imaging (MRI) provides superior soft tissue characterization and helps delineate the extent of disease [18]. Radiologists must maintain close communication with treating physicians to ensure that imaging findings are appropriately contextualized and translated into actionable clinical recommendations. Furthermore, radiologists participating in multidisciplinary case reviews enhance team-based decision-making, reduce diagnostic uncertainty, and support personalized care plans.

Integrated Care Pathway:

An ideal integrated care pathway for CARAS begins with a detailed physician-led assessment supported by nurse-administered validated questionnaires and patient-reported outcome measures. Initial pharmacologic therapy is initiated concurrently with nurse-led education on medication use and allergen avoidance strategies. Radiological imaging is employed selectively based on predefined clinical criteria, with results rapidly integrated into multidisciplinary care discussions involving physicians, nurses, and radiologists. Treatment plans are refined collaboratively, and follow-up assessments are shared between physicians and nurses. Regular interprofessional meetings, standardized care protocols, and patient-centered outcome tracking form the backbone of this integrated care model, ensuring responsiveness to patient needs and promoting continuous quality improvement.

Conclusion:

The integrated physician-nursing-radiology model represents a transformative approach to managing Combined Allergic Rhinitis and Asthma Syndrome in adults. By leveraging the complementary expertise of each discipline, healthcare teams can provide holistic, patient-centered care that addresses the full spectrum of disease burden. Physicians ensure accurate diagnosis and pharmacologic optimization, nurses drive education, adherence, and continuity, and radiologists enhance diagnostic precision and inform treatment pathways. This multidisciplinary collaboration improves disease control, reduces exacerbations, enhances quality of life, and lowers healthcare costs. Future efforts should focus on developing standardized integrated care protocols, training programs to foster interprofessional collaboration, and research to quantify the benefits of this approach in diverse healthcare settings. Embracing an integrated model for CARAS management is not only a clinical imperative but also a moral one, ensuring that patients receive the comprehensive care they deserve.

References:

[1] Bousquet J, Khaltaev N, Cruz AA, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update. Allergy. 2008;63 Suppl 86:8-160.

[2] Leynaert B, Neukirch C, Liard R, Bousquet J, Neukirch F. Quality of life in allergic rhinitis and asthma: A population-based study of young adults. Am J Respir Crit Care Med. 2000;162(4 Pt 1):1391-1396.

[3] Togias A. Rhinitis and asthma: evidence for respiratory system integration. J Allergy Clin Immunol. 2003;111(6):1171-1183.

[4] Braido F. Allergic rhinitis and asthma: Therapeutic strategies. Allergy Asthma Immunol Res. 2008;1(1):1-7.

[5] Price D, Ryan D, Pearce L, Bride L, van der Molen T. Integrated respiratory care: the future of asthma management? NPJ Prim Care Respir Med. 2014;24:14001.

[6] Ciprandi G, Cirillo I, Klersy C. The impact of allergic rhinitis on asthma: Current evidence. Expert Rev Respir Med. 2009;3(1):37-42.

[7] Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention, 2023 Update.

[8] Durrani SR, Montville DJ, Pratt AS, et al. Innate immune responses to rhinovirus are reduced by the high-affinity IgE receptor in allergic asthmatic children. J Allergy Clin Immunol. 2012;130(2):489-495.

[9] Smith AD, Cowan JO, Filsell S, et al. Diagnosing asthma: comparisons between exhaled nitric oxide measurements and conventional tests. Am J Respir Crit Care Med. 2004;169(4):473-478.

[10] Kennedy DW. Prognostic factors, outcomes and staging in ethmoid sinus surgery. Laryngoscope. 1992;102(12 Pt 2 Suppl 57):1-18.

[11] Holgate ST. The sentinel role of the airway epithelium in asthma pathogenesis. Immunol Rev. 2011;242(1):205-219.

[12] GINA Pocket Guide for Asthma Management and Prevention. Global Initiative for Asthma, 2023.

[13] Gibson PG, Powell H, Coughlan J, et al. Self-management education and regular practitioner review for adults with asthma. Cochrane Database Syst Rev. 2003;(1):CD001117.

[14] Hopkins C, Gillett S, Slack R, Lund VJ, Browne JP. Psychometric validity of the 22-item Sinonasal Outcome Test. Clin Otolaryngol. 2009;34(5):447-454.

[15] Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. JAMA. 2002;288(14):1775-1779.

[16] Zinreich SJ. Imaging for staging of rhinosinusitis. Ann Otol Rhinol Laryngol Suppl. 2004;193:19-23.

[17] Mafee MF, Chow JM, Meyers R. Functional endoscopic sinus surgery: anatomy, CT screening, indications, and complications. AJR Am J Roentgenol. 1993;160(4):735-744.

[18] Curtin HD. Imaging of the sinonasal tract. Radiology. 1986;161(1):1-10.

[19] Eassey D, Reddel HK, Ryan K, et al. Patient-centered asthma management: prioritizing patient goals and patient empowerment in research and practice. J Allergy Clin Immunol Pract. 2019;7(7):2552-2560.

[20] Bodenheimer T, Laing BY. The teamlet model of primary care. Ann Fam Med. 2007;5(5):457-461.

[21] Yawn BP, Rank MA, Bertram SL, et al. Asthma education and communication among patients and providers: missed opportunities. J Asthma. 2016;53(5):494-502.

[22] Boulet LP, Boulay ME. Asthma-related comorbidities. Expert Rev Respir Med. 2011;5(3):377-393.

[23] Castro M, Zangrilli J, Wechsler ME, et al. Reslizumab for inadequately controlled asthma with elevated blood eosinophil counts: results from two multicenter, parallel, double-blind, randomized, placebo-controlled, phase 3 trials. Lancet Respir Med. 2015;3(5):355-366.