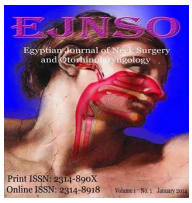
EJNSO



Value of Intranasal Corticosteroid Therapy in Patients having Allergic Rhinitis Concurrent with Uncontrolled Asthma.

Ibrahim R. Mohamed[a] and Khaled F. Alkhayat[b]

a- Lecturer of Otorhinolaryngology, ENT Department, Sohag Faculty of Medicine.

b- Lecturer of Chest Diseases, Chest Department, Sohag Faculty of Medicine.

Received: 6/12/2013

Revised: 11/1/2014

Accepted: 23/3/2014

Keywords:
allergic rhinitis, uncontrolled asthma, intranasal corticosteroids

Abstract:

Objective: To study the effect of allergic rhinitis (AR) management using inhaled intranasal corticosteroid on the outcome of uncontrolled asthma.
Methods: A prospective controlled study. All patients presented with uncontrolled asthma (FEV1 less than 80% with daily rescue medications and more than one urgent care visit/year, and on a high dose of inhaled oral corticosteroid > 880 µg fluticasone/day) with a co morbidity of AR that not received any local nasal corticosteroid treatment within the last 6 months were included in this study. They were subjected to history taking, full chest and ENT examination, skin prick test and measurement of peripheral blood eosinophils and serum total IgE. Baseline spirometry was done for all patients. They received a combined therapy of intranasal corticosteroid (100 µg mometasone) and inhaled oral corticosteroid (500 µg fluticasone) for 3 months. Then reevaluation pulmonary functions and clinical assessment of nasal allergy control were done.
Results: Forty one patients had combined AR and bronchial asthma and received combined therapy. Thirty three patients showed significant improvement in lung function (FEV1 more than 80%) and maintained a moderate dose of inhaled corticosteroid without rescue medications (p value < 0.01).
Conclusion: AR is an important risk factor of uncontrolled asthma. Concurrent management of AR significantly improves the uncontrolled asthma and significantly reduces the dose of inhaled oral corticosteroid.

1-Introduction:

Asthma and AR are related diseases, sharing similarities in many aspects. The hallmark of the airway inflammation in AR and asthma is the Th2 immune response[9]. AR is a highly prevalent, chronic disease, with rates of up to 50% in some populations[1, 2]. Its disease burden is considerable with negative impacts on sleep, mood, social functioning, work /school performance and health-related quality of life[4-6]. Furthermore, the detrimental effects of AR on established asthma and the link between AR and the subsequent development of asthma are well established[8]. This is characterized by the modulation of the inflammatory process by Th2 cytokines and the presence of eosinophils in the mucosa of the airways[10].

The prevalence of AR among asthmatics is high, around 46–100%, and the prevalence of asthma among AR patients is around 24–33%[11]. This interrelationship is reinforced by studies that demonstrated increased bronchial hyper-responsiveness in patients with AR exposed to nasal challenge and exposed to environmental allergens[12]. Similarly, segmental bronchial provocation induces nasal inflammation in patients with AR[13].

Therefore, the current study was designed to address the role of intranasal corticosteroid therapy combined with

inhaled oral corticosteroid on the management of uncontrolled asthma.

Patients and methods:

This study was approved by the Institutional Ethics Committee of Sohag Faculty of Medicine and informed written consent was obtained from all patients.
All patients presented with uncontrolled asthma (FEV1 less than 80% with daily rescue medications and more than one urgent care visit/year, and on a high dose of inhaled oral corticosteroid > 880 µg fluticasone/day) with a comorbidity of AR that not received any local Each subject performed a baseline spirometry according to American Thoracic Society guidelines using a Collins Survey Tach Spirometer (Warren Collins, Braintree, MA). Following baseline spirometry, subjects received 200µg of albuterol. Spirometry was repeated after 15 minutes.

All patients received a combined therapy of intranasal corticosteroid (100 µg mometasone) and inhaled nasal corticosteroid treatments within the last 6 months were included in the study. They were subjected to:

a. Thorough history taking.
b. Full chest and ENT examination including endoscopic examination with 0º and 30º telescopes.
c. Skin prick test: Atopy was assessed at the first visit with an immediate-type hypersensitivity skin prick test with aeroallergen extracts, performed in the forearm. The wheal diameters were measured 15 min after puncture. The test was considered positive when at least one antigen induced a reaction with a diameter 3 mm greater than that of the negative control with saline solution.
d. Blood sample collection for measurement of peripheral blood eosinophils and serum total IgE.
e. Oral corticosteroid (500 µg fluticasone) for 3 months.
f. Reevaluation of pulmonary functions and clinical assessment of nasal allergy control were done.

Results:

Over a one year period between August 2012 and August 2013, we faced 80 patients suffering from uncontrolled asthma. Forty one patients of them (51.3%) had a concurrent AR and were not received any local nasal corticosteroid treatment within the last 6 months. Their age range was 21-69 years with a mean age of 41.79 years, and the male/female ratio was 25/16.

Table (1): Demographic data of the studied patients.

Age group	Sex				Total
	Female		Male		
	No.	%	No.	%	
20 - < 30	10	32%	18	37%	28
30 - < 40	8	26%	15	31%	23
40 - < 50	7	23%	7	14%	14
50 - < 60	3	9%	6	12%	9
60 - < 70	3	10%	3	6%	6
Total	31	100%	49	100%	80

All patients with allergic rhinitis and uncontrolled asthma showed a positive skin prick test and elevated serum total IgE.

Table 2: The relationship between the IgE level and skin prick test.

IgE	≥300	≤300	Total
	41(100%)	0(0%)	41
Skin Prick Test	+ve	_ve	
	41(100%)	0(0%)	41
P value	0.00		

Table (3): Outcome of ENT examination in the studied patients.

Allergic rhinitis	No.	%
+Ve	41	51%
-Ve	39	49%
Total	80	100.0%

Analysis of patients with allergic rhinitis and sever bronchial asthma receiving combined intranasal and oral inhaled corticosteroids showing the following results: There was highly significant relation between combined therapy (inhaled oral and intranasal corticosteroid) and pulmonary function (FEV1 more than 80%) after 3 months follow up clinically and functionally.

Table (4): Relation between combined therapy (inhaled oral and intranasal corticosteroid) and pulmonary function (FEV1 more than 80%).

	Pulmonary function (FEV1)		
	Less than 80% (%)	More than 80% (%)	Total
Prior to combined therapy	35 (85.4%)	6 (14.6%)	41 (100%)
After combined therapy	8 (19.5%)	33 (80.5%)	
X2	12.99		
P value	0.0001		

Chi-Square Test was used, P value highly significant ($P < 0.001$) There was significant relation between the combined therapy and total asthma control (according to GINA guidelines Patients without persistent asthma symptoms, according to GINA criteria and using <1200 μg/day of inhaled budesonide or equivalent).

Table (5): Relation between combined therapy and total asthma control.

Combined therapy	Total asthma control		
	Uncontrolled No (%)	Controlled No (%)	Total
Prior to combined therapy	32 (78.04%)	9 (21.96%)	41 (100%)
After combined therapy	8 (19.5%)	33 (80.5%)	
X^2	9.54		
P value	0.01		

Chi-Square Test was used, P value significant ($P < 0.05$)

Discussion:

Allergic rhinitis (AR) contributes to asthma severity and increases risk for hospitalizations and emergency department visits in patients with asthma[2, 3]. Treatment of co morbid AR may reduce the odds of asthma-related healthcare by up to 80%[4]. Based on their frequent coexistence and shared pathophysiologic features, asthma and AR are thought to result from inflammation of a continuous

respiratory tract[5]. Various mechanisms may account for AR in asthmatics, but it remains unclear why only some asthmatics develop AR[6].

Risk factors for AR in asthmatics are likely distinct from those for AR or asthma alone, since not all asthmatics develop AR and not all patients with AR have asthma. Identification of risk factors for AR in asthmatics could facilitate its diagnosis and treatment, which could decrease asthma morbidity[7]. In this study, allergic rhinitis was strongly associated with parameters that indicate greater asthma severity. This was demonstrated by the increased risk of any emergency room visit for acute asthma in the follow-up, poor asthma control, less reduction in the number of emergency room visits in the follow-up period and limited improvement in airway obstruction after follow-up.

Patients with allergic rhinitis also had an increased risk of any emergency room visit for acute asthma and a smaller reduction in the number of emergency room visits in the follow-up. These results are in accordance with data from previous retrospective studies, which recorded more severe symptoms of asthma and increased risk for emergency room visits and for hospital admissions for acute asthma among the patients with concomitant allergic rhinitis[14-16].

The present study reinforces the association between allergic rhinitis, asthma severity and cost of asthma management. This is an important issue, because the concept that allergic rhinitis impacts on asthma control is largely accepted. The treatment of allergic rhinitis to improve control of asthma is currently recommended, supported by retrospective studies[18-20]. Some clinical trials support this recommendation[21], while others suggest that treating allergic rhinitis per se does not improve asthma control[22].

Although the interrelationship between asthma and allergic rhinitis is largely demonstrated, the impact of allergic rhinitis treatment on asthma is still a matter of investigation. Our results suggest that future research should focus on evaluating the cost-effectiveness of adding nasal corticosteroids for the treatment of severe asthma in patients with allergic rhinitis. The results of this study cannot be assumed as necessarily valid for patients with mild/moderate asthma, as all subjects in our study had severe asthma upon entry in the program.

In conclusion, in a sample of ambulatory patients with severe asthma, allergic rhinitis was associated with increased asthma severity and reduced response to treatment. Our data also indicated that combined treatment of allergic rhinitis and bronchial asthma improve the asthma outcome.

References:

1- Katelaris CH, Lee BW, Potter PC, Maspero JF, Cingi C, Lopatin A, Saffer M, Xu G, Walters RD. Prevalence and diversity of allergic rhinitis in regions of the world beyond Europe and North America. Clin Exp Allergy. 2012;3:186–207. doi: 10.1111/j.1365-2222.2011.03891.x

2- Bauchau V, Durham SR. Epidemiological characterization of the intermittent and persistent types of allergic rhinitis. Allergy. 2005;3:350–353. doi: 10.1111/j.1398-9995.2005.00751.x.

3- Asher MI, Montefort S, Björkstén B, Lai CK, Strachan DP, Weiland SK, Williams H. ISAAC Phase Three Study Group. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood: ISAAC Phases One and Three repeat multicountry cross-sectional surveys. Lancet. 2006;3:733–743. doi: 10.1016/S0140-6736(06)69283-0.

4- Nathan RA. The burden of allergic rhinitis. Allergy Asthma Proc. 2007;3:3 9.doi:10.2500/aap.2007.28.2934.

5- Léger D, Annesi-Maesano I, Carat F, Rugina M, Chanal I, Pribil C, El Hasnaoui A, Bousquet J. Allergic rhinitis and its consequences on quality of sleep. An unexplored area. Arch Intern Med. 2006;3:1744–1748. doi: 10.1001/archinte.166.16.1744.

6- Meltzer EO. Quality of life in adults and children with allergic rhinitis. J Allergy Clin Immunol. 2001;3:S45–53. doi: 10.1067/mai.2001.115566.

7- Meltzer EO, Bukstein DA. The economic impact of allergic rhinitis and current guidelines for treatment. Ann Allergy Asthma Immunol. 2011;3:S12–16. doi: 10.1016/j.anai.2010.10.014.

8- Shaaban R, Zureik M, Soussan D, Neukirch C, Heinrich J, Sunyer J, Wjst M, Cerveri I, Pin I, Bousquet J, Jarvis D, Burney PG, Neukirch F, Leynaert B. Rhinitis and onset of asthma: a longitudinal population-based study. Lancet. 2008;3:1049– 1057. doi: 10.1016/S0140-6736(08)61446-4.

9- Kay AB. Allergy and allergic diseases. First of two parts. N Engl J Med 2001;344:30–37.

10- Chanez P, Vignola AM, Vic P, Guddo F, Bonsignore G, Godard P et al. Comparison between nasal and bronchial inflammation in asthmatics and control subjects. Am J Respir Crit Care Med 1999;159:588–595.

11- Cruz AA, Popov T, Pawankar R, Annesi-Maesano I, Fokkens W, Kemp J et al. Common characteristics of upper and lower airways in rhinitis and asthma: ARIA update, in collaboration with GA2LEN. Allergy 2007;62:1–41

12- Corren J, Adinoff AD, Irvin CG. Changes in bronchial responsiveness following nasal provocation with allergen. J Allergy Clin Immunol 1992;89:611–618.

13- Prieto L, Uixera S, Gutierrez V, Bruno L. Modifications of airway responsiveness to adenosine 5'-monophosphate and exhaled nitric oxide concentrations after the pollen season in subjects with pollen-induced rhinitis. Chest 2002;122:940–947.

14- Kocevar VS, Thomas J, Jonsson L, Yin DD, Bisgaard H. Association between allergic rhinitis and hospital resource use among asthmatic children in Norway. Allergy 2005;60:338–342.

15- Thomas M, Kocevar VS, Zhang Q, Yin DD, Price D. Asthma related heath resource use among asthmatic children with and without concomitant allergic rhinitis. Pediatrics 2005;115:129–134.

16- Price D, Zhang Q, Kocevar VS, Yin DD, Thomas M. Effect of a concomitant diagnosis of allergic rhinitis on astma-related heath care use by adults. Clin Exp Allergy 2005;35:282–287.

17- Adams RJ, Fuhlbridgge AL, Finkelstein JA, Weiss ST. Intranasal steroids and the risk of emergency department visits for asthma. J Allergy Clin Immunol 2002;109:636–642.

18- Crystal-Peters J, Neslusan C, Crown WH, Torres A. Treating allergic rhinitis in patients with comorbid asthma: the risk of asthma-related hospitalizations and emergency department visits. J Allergy Clin Immunol 2002; 109:57–62.

19- Corren J, Manning BE, Thompson SF, Hennessy S, Strom BL. Rhinitis therapy and the prevention of hospital care for asthma: a case control study. J Allergy Clin Immunol 2004;113:415–419.

20-Nathan RA, Finn AF, Laforce C, Ratner P, Chapman D, De Guia EC et al. Comparison of Cetirizine-pseudoephedrine and placebo in patients with seasonal allergic rhinitis and concomitant mild-to-moderate asthma: randomized, double-blind study. Ann Allergy Asthma Immunol 2006;97:389–396.

21-Nathan RA, Yancey SW, Waitkus-Edwards K, Prillaman BA, Stauffer JL, Philpot E et al. Fluticasone propionate nasal spray is superior to Montelukast for allergic rhinitis while neither affects overall asthma control. Chest 2005;128:1910–1920.

22-Dahl R, Nielsen LP, Kips J, Foresi A, Cauwenberge P, Tudoric N et al. Intranasal and inhaled fluticasone propionate for pollen-induced rhinitis and asthma. Allergy 2005;60: 875–881.