

Effect of Instructional Guideline on Allergic Rhinitis Symptoms

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Abstract: Allergic rhinitis has been described as a disease that may appear quite bearable to the non sufferer. However, it is associated with impairments in how patients function physically, emotionally and socially. The aim of this study was to evaluate the effectiveness of instructional guideline on improving allergic rhinitis symptoms. Subjects and methods: A quasi experimental study design, using a purposeful sample of 60 adult patients suffering from allergic rhinitis with the following criteria: perennial rhinitis, their ages ranged between 18-55 years, non smokers and the infected allergic rhinitis were excluded. Setting: The study was carried out at the (E.N.T.) clinic in El Demerdash Teaching Hospital, Ain Shams University. Tools: Three tools were used to collect data, 1) an interviewing questionnaire, include socio-demographic characteristics of the study, assessment of patient's knowledge about the concept of allergic rhinitis and how to prevent it and questionnaire part to assess patients house hold hygiene practices and using of saline nasal lavage, 2) clinical assessment format including 2 parts a) clinical nose examination, b) Lab examination of nasal secretion for eosinophils, 3) instructional guideline leaflet for household hygiene practices and saline nasal lavage. The results of the study revealed positive effect for using topical saline lavage in addition to household hygiene practices in improving signs and symptoms of allergic rhinitis with more improvement with hypertonic saline in group (2). The study recommended the use of topical hypertonic nasal saline lavage in improving of allergic rhinitis symptoms and increase health awareness about the importance of nose hygiene and household hygiene practices.

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1. Introduction:

Allergic rhinitis is an inflammation of the nasal passage membranes in which substances that trigger an inflammatory response are called allergens which most commonly are dust mite in perennial allergic rhinitis. The body attempts to rid itself of substances perceived as harmful by releasing chemical mediators that cause inflammatory response that leads to tissue damage (Craven & Hirnle, 2009).

In the developed countries, it is estimated that approximately 30% of the general population suffer from one or more allergic disorders, of which allergic rhinitis is the most common perennial rhinitis, the most often due to allergy to house dust mite. (Cates et al., 2007 and Sheikh et al., 2007)

House dust mites are found in most homes. They are microscopic, eight-legged creatures closely associated with us. It is a cosmopolitan guest in human habitation. It feed on organic detritus such as flakes of shed human skin and flourish in the stable environment of dwellings (Ogg, 2011).

Good household hygiene practices may improve indoor air quality in the domestic environment. Existing literature has shown that home dampness increases indoor mold burden and is

associated with increased allergic symptoms of rhinitis (Zhang et al., 2005; and Tham et al., 2007).

In allergic rhinitis, symptoms may be seasonal, following contact with grass, trees or flowers, pollen or perennial when the patient near animals, such as cats, dogs or horses; near feathers, including pillows, quilts or in a dusty part of house (house dust mite is the allergen), the patient gets a runny or stuffy nose or start to sneeze (Leynaert et al., 2005; and Craven & Hirnle, 2009). Symptoms also include rhinorrhea, nasal congestion, and sneezing are annoying in themselves, but patients also experience non-nasal symptoms that are troublesome, including headache, thirst and disturbed sleep, some adults reported a decrease in productivity and concentration (Thomas and Platts-Mills, 2009).

Allergic rhinitis and asthma very often coexist in the same patients and both diseases impair quality of life. Poorly managed allergic rhinitis may also complicate management of asthma and may be associated with poor asthma outcomes (Togias, 2003 and Philip et al., 2004). In a similar study, Valovirta and Pawnskar (2006) surveyed over 1600 patients with asthma and found that 73% reported symptoms

of allergic rhinitis before they were diagnosed with asthma.

Saline solution is a salt solution it helps reduce congestion and nasal irritation and there is evidence that saline nasal lavage is beneficial in reducing allergen level in the nose and helps clear out pollen and dander, moistening the mucosa and reduce tissue swelling and so treatment of allergic rhinitis symptoms. This may reduce the need for antibiotics in those people prone to sinus infections (Harvey et al., 2007, Saed, 2007, and More, 2011). It is wise to regularly expose blankets and all bedding including pillows to direct sun light 15-20 minutes as the ultraviolet C (UVC) rays kill dust mites and anything living, virus, bacteria and mould spores (Thomas and Platts-Mills, 2009).

Although allergic rhinitis is not life threatening, it is bothersome for affected patients, negatively impacts quality of life, and may impair work place performance (Philip et al., 2004).

Significance of the problem:

The number of people affected by allergic disease has risen considerably over the last four decades and the major manifestations are allergic rhinitis. It is a global health problem worldwide and its prevalence is increasing (Bousquet, 2002). As reported by the WHO (2009) in Egypt 10% of population suffers from allergic rhinitis. Allergic rhinitis was present in 63% of asthmatic patients (Omar et al., 2005). Accordingly, it was crucial to the nurses to focus more attention to this problem and develop teaching guidelines to prevent and manage allergic rhinitis based on patients' needs.

Aim of the study

This study aims to evaluate the effectiveness of instructional guideline on improving allergic rhinitis symptoms through:

1-Assessing allergic rhinitis patients knowledge

2-Assessing allergic rhinitis patients house hold hygiene practices and assess using nasal saline lavage (guideline).

3-Clinical nose examination to assess nasal secretion, color of nasal mucosa and nasal septum.

4-Lab investigation of nasal secretions for eosinophils.

5-Assess signs and symptoms of allergic rhinitis patients.

Research questions

1-Can the instructional guideline lead to improvement of patient's knowledge about allergic rhinitis?

2-Which concentration of [nasal saline lavage (0.9% or 3%) in addition to house-hold hygiene] (guideline) will improve allergic rhinitis symptoms?

3-Is there a relation between loss of smell sense and duration of allergic rhinitis?

2. Methodology

Design: The research design used was quasi-experimental study.

Setting: The study was carried out at the E.N.T. out patients' clinic in El Demerdash Teaching Hospital, Ain Shams University.

Subjects: Purposeful sample of seventy adult patients of both sexes with perennial rhinitis which represent 10% from the previously year attended allergic rhinitis cases to the E.N.T out patients clinic by the help of E.N.T physician to choose cases which diagnosed allergic rhinitis without infection, their ages ranged between 18-55 years. This sample was collected over 3 months from beginning of November, 2009 to the end of January, 2010.

Exclusion criteria: Smokers and allergic rhinitis with infection.

Tools: Three tools were used:

1. A structured interview questionnaire: developed by the researchers based on literature review including 3 main parts:

a) Demographic data such as age, sex, educational level, duration of illness, patient's history, medication used, and signs and symptoms of disease.

b) Assessment of patient's knowledge about allergic rhinitis, causes, management and prevention.

c) Questionnaire part to assess patients house hold hygiene practices and using of saline nasal lavage (we using questionnaire because some items were not easy to be observed by the researchers and it may done at any time during the 24 hrs of the day).

2. Clinical assessment format including 2 parts:

a) Clinical nasal examination including nasal secretion, color of nasal mucosa and nasal septum by specialist in E.N.T.

b) Lab investigation of nasal secretions for eosinophils (which is a white blood cells increased in allergic reactions) by specialist in pathology.

3. An instructional guideline leaflets developed by the researchers based on literature review including:

a) Basic knowledge about allergic rhinitis includes definition of allergic rhinitis, causes, and signs and symptoms of allergic rhinitis.

b) Instructional guideline about importance and how to use saline nasal lavage. The patients were instructed to use 10 ml syringe saline without the

needle for both nasal cavities by the solution 3-4 times daily, squeezed it with moderate force and allow saline come back out through the nose, this for one month.

- Improve household hygiene practices as changing bed linen and pillow case regularly, vacuuming the floor and remove dust or use dry dust mop. Avoid dampness at home, avoid dampness to mattress, and expose bed linen and pillow to sun light 15-20 minutes daily, expose mattresses to sun light every month. Home visit was carried out in the morning during the sun shine to the study subjects to examine adherence to these instructions by visit 5 patients per day for 3 days per week for one month.

Fieldwork:

Data collection

Subjects were interviewed by the researchers, after explaining the aim of the study. Consent form was obtained from every patient willing to participate. Those patients were assigned to 2 equally matched groups. Each group contains 35 patients. First group were using isotonic saline solution (0.9%) in addition to household hygiene and the second group were using hypertonic saline solution (3.0%) in addition to household hygiene, while any other medications used to treat allergic rhinitis were stopped to exclude their effects on the study results for a period of 1 month.

Pre assessment phase was done before implementing the guideline to collect pre assessment data and prepare the patients for implementing the guideline. It was carried out during February 2010, in addition to clinical nose examination and nasal secretion swab through predetermined appointment with them by phone calls.

Nasal swabs were taken from the patients (2 times), in addition to clinical nose examination, prior to application of instructional guideline and using of saline solution. Second time swabs were taken after one month from the application of the instructions and using of saline solution.

Technique of nasal swabs which done by physician: It was taken from patient while immobilizing patient's head, insert swab into the nostril to the posterior nares. Left in place for a few seconds, then removed and kept in sterile broth and transmitted quickly to the lab for eosinophils smear.

Implementation phase: It was done from March 1, till March 30, 2010 in which the researchers interviewed the study subjects explain to them the guideline, demonstrate and redemonstrate to them how to use nasal saline lavage and distributed handouts and 3 bottle of saline solution to all of them. The intervention included group discussion of 5-10

participants for 3 days per week, who met with the researcher for at least one hour.

Evaluation phase: to determine which concentration of saline nasal lavage was effective with household hygiene in improving of allergic rhinitis symptom. It was carried out in May, 2010 and included post assessment questionnaire about patient's knowledge and using saline nasal lavage and examining household hygiene practices in addition to clinical nose examination and swab.

Ethical considerations

Prior to the pilot study, ethical approval was obtained, as well as consent from each participant. They were assured that anonymity and confidentiality would be guaranteed and that they have the right to withdraw from the study at any time without giving any reason. Stop medications that used to treat allergic rhinitis for one month is done under supervision of E.N.T physician.

Pilot study: It was done on 10% of the study subjects to evaluate the clarity, feasibility and applicability of the study tools. According to it, some modifications were done.

Tools validity: Tools were evaluated for face and content validity by 5 experts in the field of the study.

N.B. Limitation of the study: a total number of ten patients were not able to attend the evaluation phase, so they were dropped out of the study and the final sample consisted of sixty patients.

Statistical analysis:

The collected data were coded and analyzed by the researchers. Non parametric tests were used for comparison between, pre implementation and post implementation of guideline to subjects. Chi-square and t-test were used and p-value less than 0.05 were considered significant.

Scoring system:

For knowledge and practice items a correct response was scored (1) and an incorrect one was scored zero, satisfactory level was considered from 70% and above.

3. Results

Table (1) elaborates the demographic characteristics of the studied subjects, as 55% of them, their age ranged 18-<30 years, and for gender, 55% of them were females and 45% were males. According to duration of disease for 50% of the patients it was less than 5 years. In addition, 65% of the study subjects were married.

Table (2) displays history of illness among the study subjects. Results clarified that 30% only knew the right diagnosis of the disease from its beginning, while the others considered it a routine common cold, and 15% of them get immunotherapy. As regards family history, 86.7% had a positive family history of allergic rhinitis. As well, 41.7% of the study subjects get sneezing when exposed to cigarette smoking, and 91.7% when getting up from the bed.

Table (3) demonstrates comparison between the two groups of patients as regards socio-demographic characteristics. The results clarified that there were no statistically significant differences between them, so they were comparable groups.

Table (4) shows the distribution of the two groups under study in relation to their satisfactory

level of knowledge. There were highly statistically significant differences between pre and post implementation of the guideline for the two groups.

As seen in table (5), pre and post implementation of guideline for group 1 and 2, there were highly statistically significant improvements in their practices of nasal saline lavage and household hygiene practices with more improvements in group 1.

According to clinical features of allergic rhinitis and nasal smear for eosinophils for group (1) and (2), there were highly statistically significant differences between pre and post implementation of the guideline with more improvements in group 2 (Table 6).

Table (7), indicates that there is no relation between loss of smell sense and duration of disease.

Table (1):Socio-demographic characteristics of the study subjects (n=60).

Items	No	%
Age:		
18-	33	55
30-	12	20
40-55	15	25
Mean \pm SD	31.8 \pm 9.4	
Gender:		
Male	27	45
Female	33	55
Duration of disease (in years):		
<5	30	50
5-	15	25
10-20	15	25
Mean \pm SD	7.1 \pm 4.9	
Educational level:		
Illiterate	9	15
Read and write	9	15
Moderate	24	40
High	18	30
Marital status:		
Single	21	35
Married	39	65

Table (2):History of illness among the study subjects (n=60).

Items	No	%
- Knowing right diagnosis from the onset of allergic rhinitis	18	30
Drug used:		
- Anti histaminic and decongestant	60	100
- Corticosteroid nasal spray	50	83.3
- Immunotherapy	9	15
Family history: +ve	52	86.7
-ve	8	13.3
Frequent sneezing: (mean manifestation of allergic rhinitis)		
- When exposed to dust	60	100
- When exposed to cigarette smoking	25	41.7
- When exposed to perfume or insecticide odor	15	25
- When getting up from bed	55	91.7

Table (3): Comparison between the two groups of patients as regards socio-demographic characteristics

Items	Group I (isotonic saline)		Group 2 (hyper tonic saline)		Test of Sig. & P-value
	No	%	No	%	
Age (in years):					
18-	16	53.3	17	56.7	t=0.04 >0.05 Insig.
30-	7	23.3	5	16.7	
40-55	7	23.3	8	26.7	
X ± SD	32.0±9.8		32.1±10.3		
Gender:					X ² =0.08 >0.05 Insig.
Male	13	43.3	14	46.7	
Female	17	56.7	16	53.3	
Duration of disease in years:					t=0.11 >0.05 Insig.
>5					
5-	15	50	15	50	
10+	8	26.7	7	23.3	
X ± SD	6.9±3.5		7.0±3.5		
Educational level:					X ² = 0.62 >0.05 Insig.
Illiterate	5	16.7	4	13.3	
Read & write	4	13.3	5	16.7	
Moderate	13	43.3	11	36.7	
High	8	26.7	10	33.3	

Table (4): Distribution of the 2 groups of patients under study pre and post application of the guideline in relation to their knowledge

	Group I (n = 30) Satisfactory				Group 2 (n = 30) Satisfactory			
	Pre		Post		Pre		Post	
	No	%	No	%	No	%	No	%
Definition of allergic rhinitis	4	13.3	25	83.3	5	16.7	29	96.7
Causes	7	23.3	28	93.3	8	26.7	30	100
Signs and symptoms	5	16.7	28	93.3	7	23.3	28	93.3
Importance of saline lavage	4	13.3	30	100	2	6.7	30	100
Relation of dust and nasal allergy	13	43.3	30	100	17	56.7	30	100
Importance of exposure of mattress to sunlight	5	16.7	30	100	4	13.3	30	100
Importance of cleaning of bedding	6	20	30	100	3	10	30	100
X ²	241.5				257.6			
P	< 0.001				<0.001			
Sig.	HS				HS			

Table (5): Nasal saline lavage and house hold hygiene practices stated by the study subject groups (1 & 2), pre and post application of guideline (n=30).

	Group I (n = 30)				Group 2 (n = 30)			
	Pre (done)		Post (done)		Pre (done)		Post (done)	
	No	%	No	%	No	%	No	%
Change bed linen and pillow case regularly	10	33.3	28	93.3	9	30	26	86.7
Vacuum floor or use dry dust mop.	8	26.7	24	80	10	33.3	25	83.3
Avoid dampness at home	5	16.7	27	90	7	23.3	26	86.7
Avoid dampness of mattress	22	73.3	27	90	20	66.7	29	96.7
Expose bed linen and pillow to sunlight 5-20 minutes daily	10	33.3	28	93.3	12	40	27	90
Expose mattress to sun light every month	6	20	15	50	7	23.3	14	46.7
Clean each nostril with 10 ml saline 3-4 times/day for one month	0	0	28	93.3	0	0	27	90
X ²	130.6				115.4			
P-value	< 0.001				<0.001			
Sig.	HS				HS			

Table (6): Clinical features of allergic rhinitis among the study subjects pre/post application of the guideline.

Items	Group 1 (n = 30) on saline nasal lavage 0.9%					Group 2 (n=30) on saline nasal lavage 3%				
	Pre		Post		X ² P-value & Sig	Pre		Post		X ² P-value & Sig
	No	%	No	%		No	%	No	%	
Symptoms										
Rhinorrhea	30	100	7	23.3	37.4 <0.001 HS	30	100	3	10	49.2 <0.001 HS
Itchy nose	30	100	7	23.3	37.4 <0.001 HS	30	100	3	10	49.2 <0.001 HS
Itchy eyes	12	40	6	20.0	2.9 >0.05 Insig.	13	43.3	4	13.3	6.7 <0.05 S
Frequent sneezing	25	83.3	7	23.3	21.8 <0.001 HS	26	86.7	4	13.3	32.4 <0.001 HS
Disturbed sleep	15	50	0.0	0.0	20 <0.001 HS	12	40	0	0	15 <0.001 HS
Loss of smell sense	18	60	0.0	0.0	25.7 <0.001 HS	20	66.7	0	0	30 <0.001 HS
Posterior nasal discharge	30	100	15	50.0	20 <0.001 HS	28	93.3	10	33.3	23.3 <0.001 S
Frequent sick leave	18	60	2	6.7	19.2 <0.001 HS	15	50	0	0	20 <0.001 HS
Headache	25	83.3	6	20	24.1 <0.001 HS	26	86.7	4	13.3	32.4 <0.001 HS
Clinical signs:										
Discharge										
* Watery	30	100	7	23.3	37.4 <0.001 HS	30	100	3	10	49.2 <0.001 HS
* No discharge	-	-	23	76.7		-	-	27	90	
Color of mucosa										
* Violet bluish	30	100	10	33.3	30.0 <0.001 HS	30	100	4	13.3	45.9 <0.001 HS
* Pink	-	-	20	66.7		-	-	26	86.7	
Positive nasal smear for eosinophils	27	90	6	20	29.7 <0.001 HS	28	93.3	3	10	41.8 <0.001 HS

Table (7): Relation between stated loss of smell sense by study subjects and duration of allergic rhinitis

Duration of Disease (in years)	Loss of Smell Sense				X ² P-value Sig.
	Yes		No		
	No	%	No	%	
< 5	10	16.7	20	33.3	2.9 >0.05 NS
5-	2	3.3	13	21.7	
10-20	6	10	9	15	

4. Discussion

Allergic rhinitis is a common health problem for which many patients do not seek appropriate medical care (WHO, 2009). The present study revealed that one quarter of the study subjects had duration of disease from 10-20 years. This is to some extent in agreement with the Allergy U.K. survey (2005) of 1000 people, which revealed that 90% of people surveyed had the condition of allergic rhinitis for over 10 years, also these findings are in accordance with McIlInnis (2010), who in a very recent study mentioned that, allergic rhinitis is a long term and often life long condition.

The study results revealed that all the study subjects were perennial allergic rhinitis and it affects both sexes by nearly equal percent, slightly more than two fifths get sneezing when exposed to cigarette smoke and most of them when getting up from the bed. This finding is consistent with McIlInnis (2010), who stated that perennial allergies cause symptoms continuously throughout the year due to constant allergen exposure. Household allergens are typically the causative agents of perennial allergies and include such things as house dust mites, mold spores, cigarette smoke, and pet dander.

Most of the study subjects don't know the actual diagnosis from the onset of allergic rhinitis and consider it a recurrence of routine common cold. This finding contradicted with Kumar and Clark (2005), who ensured that colds are frequent during the winter but if the symptoms persist for weeks the patient is probably suffering from perennial rhinitis.

As regards the study subjects knowledge about the concept of allergic rhinitis and how to prevent and control it, there was a highly statistically significant difference between pre and post implementation of the guideline for the 2 groups (1) this finding answers the research question one. This result is congruent with that of Mohamed et al. (2006), who found that the improvement in

knowledge of their study subjects led to positive effect on controlling their psychological stressors.

Regarding to practices of nasal saline lavage and house hold hygiene practices, the current study results revealed a highly statistically significant difference between pre and post implementation of the guideline for the 2 groups with more improvement in group (1), on isotonic nasal saline lavage. This could be due to that the patients become exhausted from the symptoms and have the desire to overcome this problem.

According to clinical features of allergic rhinitis and nasal smear for eosinophils, there was a highly statistically significant difference between pre and post applying of the guideline for the 2 groups with more improvement in group (2) on hypertonic saline. This finding answers the research question (2), which implies that hypertonic saline had better effect than isotonic saline, in addition to household hygiene practices. This finding is congruent with Clark (2008), who emphasized that, in recent years, greater attention has been given to the health risks posed by environmental conditions. According to the WHO (2009) report, approximately 25 to 30% of the global burden of disease is due to environmental exposure. The report also added that household hygiene practices that are low cost activities can be quite effective in keeping persons healthy. In accordance, Custovic and Vanwijk (2005), mentioned that, avoidance of allergen exposure should lead to an improvement in the patients clinical condition. This also agreed with Shoseyov et al. (1998), who found that hypertonic saline is an efficient treatment of chronic sinusitis.

Approximately half of the study subjects were suffering from disturbed sleep pre implementation of the guideline which improved post implementation. This agree with Mann (2011) who mentioned that sleep is an important as what we eat, lack of sleep can lead to excessive day time

sleepiness, tiredness and lethargy, morning headache, poor memory, anxiety and depression subsequently affect quality of life.

Concerning the research question (3), there was no relation between loss of smell sense and duration of suffering from allergic rhinitis. This result gives attention to take the problem seriously and ask about proper management from its beginning because loss of smell sense is a problem that affects quality of life as mentioned by the patients that it affected also taste and smell on eating, and make problems with spouse as more than half of the subjects were married and also can lead to life threatening situations in home as they can not smell oven gas as mentioned by the study subjects which return after using of the instructional guideline.

5. Conclusion

There was a positive effect of daily nasal lavage with hypertonic saline and improved household hygiene practices in improving and preventing nasal symptoms of allergic rhinitis.

Recommendations

- The use of topical hypertonic saline could be included as an adjunct to the medical management for the symptoms of allergic rhinitis.
- National program to be launched through mass media for public awareness about concept of allergic rhinitis, and how to prevent and manage it.
- Increase health awareness about the importance of nose hygiene and household hygiene practices.

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6. References:

- Allergy, U.K. Survey (2005): Night and day. London: Allergy UK.
- Bousquet, J. (2002): Allergic rhinitis and its impact on asthma in collaboration with the world health area. Primary Care Respiratory Journal; 11(1): 8-7.
- Cates, E.C., Fattouh, R., Johnson, J.R., Liop-Guevara, A. & Jordana, M. (2007): Modeling

responses to respiratory house dust mite exposure. Contrib. Microbiol.; 14:42-67.

- Clark, M.J. (2008): Community health nursing, (5th ed.), Prentice Hall: New Jersey, Upper Saddle River, p. 833.
- Craven, R.F. & Hirnle, C.J. (2009): Fundamentals of nursing 6th ed., Lippincott Williams and Wilkins: Philadelphia, pp. 820-821.
- Custovic, A., & Vanwijk, R.G. (2005): The effectiveness of measures to change the indoor environment in the treatment of allergic rhinitis and asthma: ARIA update (in collaboration with GAZLEN). Allergy; 60(9): 1112-1115.
- Harvey, R., Hannan, S.A., Badia, L., & Scadding, G. (2007): Nasal saline irrigations for the symptoms of chronic rhinosinusitis. Otolaryngol. Head Neck Surg., Oct.; 137(4):532-4.
- Kumar, P.P. & Clark, D.M. (2005): Clinical medicine (6th ed.), Elsevier Saunders: Spain, p. 882.
- Leynaert, B., Neukirch, C., Liard, R., Bousquet, J. & Neukirch, F. (2005): Quality of life in allergic rhinitis and asthma. Am. J. Respir. Crit. Care. Med.; 162: 1391-1396.
- McIlennis, J.K. (2010): Available at: <http://www.googleRunnynose>, sneezing, itchy eyes. a review of Allergic rhinitis.
- Mann, D. (2011): Available at: <http://www.webmed.com/sleep> disorders/excessive-sleepness-10/diabetes-lake-of-sleep .accessed January
- Mohamed, S.A., Mohamed, H.S., & Abdel, Al, M.H. (2006): The effect of stress management techniques on controlling stressors among patients with chronic renal failure. The Egyptian Journal of Medical Sciences December; 27(2): 788.
- More,D (2011): available at: <http://www.en.wikipedia.org/wik:/nasal> saline irrigation.accessed January
- Ogg,B. (2011): available at:<http://www.wikipedia,the> free encyclopedia.house dust mite.
- Omar, M.T., El Lakanny, M., Hassan, M.F., Nassif, N. & Abd El Shafy (2005): Prevalence of nasal and sinus disease in A topic asthmatic children in Behera. The New Egyptian Journal of Medicine; 33(4): 85-90.
- Philip, G., Nayak, A.S., & Berger, W.E. (2004): The effect of montelukast on rhinitis symptoms in patients with asthma and seasonal allergic rhinitis. Curr. Med. Res. Opin.; 20(10):1549-1558.
- Saed, S.S. (2007): The effect of several irrigating solutions on physical properties of root canal dentin. Doctorate Thesis, Faculty of Dentistry, Ain Shams University.
- Sheikh, A., Hurwitz, B., & Shehata, Y. (2007): House dust mite avoidance measures for perennial

- allergic rhinitis. *Cochrane Database Syst. Rev.* Jan.; 24(1): CD001563
- Shoseyov, D., Bibi, H., Shai, P., Shoseyov, N., Shazberg, G., & Hurvitz, H. (1998): Treatment with hypertonic saline versus normal saline nasal wash of pediatric chronic sinusitis. *Allergy Clin. Immunol.*; 101(5): 602-5.
- Tham, K.W., Zuraimins, M.S., Koh, D., Chew, F.T., & Ooi, P.L. (2007): Associations between home dampness and presence of molds with asthma and allergic symptoms among young children in the tropics. *Pediatr-Allergy Immunol.*; 18(5): 418-24.
- Thomas, A.E., & Platts-Mills, A. (2009): Bedding care instruction. Available at: www.ecobedroom.com/1/bedding/care/instructions.html.cached.
- Togias, A. (2003): Rhinitis and asthma: Evidence for respiratory system integration. *J. Allergy Clin. Immunol.*; 111:1171-1183.
- Valovirta, E. & Pawankar, R. (2006): Survey of the impact of comorbid allergic rhinitis in patients with asthma. *BMC Pulmonary Medicine*; 6(1): 53.
- WHO (2009): WHO country report allergic rhinitis. Available at: www.cureresearch.com/allergic_rhinitis/stats-country.htm.
- Zhang, G., Spickett, J., Lee, A.H., Rumchev, K., & Stick, S. (2005): Household hygiene practices in relation to dampness at home and current wheezing and rhino-conjunctivitis among school age children. *Pediatr. Allergy Immunol.*; 16(7): 587-92.

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