

CLINICOEPIDEMIOLOGICAL PATTERN OF ALLERGIC RHINITIS IN ADULTS IN ADO-EKITI, NIGERIA

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SUMMARY

Background/Aims: Allergic rhinitis is one of the commonest ear, nose and throat diseases with significant morbidity, complications and impact on the quality of life of the sufferers worldwide.

This study aimed at determining the prevalence, socio-demographic features, trigger factors, clinical features, complications, quality of life and associated comorbid illnesses among allergic rhinitis patients attending Ekiti state university teaching hospital, Ado Ekiti, south west Nigeria.

Methodology: This is a prospective hospital based study of all patients with a clinical diagnosis of allergic rhinitis at Ekiti state university teaching hospital, Ado Ekiti. The study was carried out over a period of 2 years (between January 2014 and December 2016). Informed consent was obtained from patients/parents/guardian. Data was obtained by using interviewer assisted questionnaire, which has been pre tested. The data obtained were collated and analyzed by using SPSS statistical software version 16.0. Ethical clearance was sought for and obtained from ethical committee of the institution.

Results: A total of 4,341 patients were seen at ear, nose and throat department out of which 305 patients had a clinical diagnosis of Allergic rhinitis. The prevalence of allergic rhinitis in this study was 7.0%. There was male preponderance of 63.0% over female sex with Male to female ratio 2:1. Large percentages (88.9%) of patients in this study were able to identify their allergens (triggers). The commonest triggering factors were dust 76.1% and smoke 71.8%. Perennial and

seasonal allergic rhinitis in this study was noted to be 45.2% and 54.8% respectively. There was family history of allergic rhinitis in 58.4% of our patients. All the patients presented with nasal symptoms, of which nasal blockage accounted for 87.5%.

Majority of the patients had one or more form of associated comorbid illnesses with allergic rhinitis. These include 22.6% recurrent tonsillitis, 17.7% adenoid hypertrophy and 15.7% inferior turbinate hypertrophy.

The main quality of life affected in this study includes sleep disturbance, social functioning and depression which accounted for 37.4%, 32.5% and 24.6% respectively.

Nonsurgical treatments were offered to 53.8% patients. Most frequently type of surgical procedures performed in this study were antral lavage in 26.9% patients; partial turbinectomy in 20.0% and 9.5% had tonsillectomy.

Conclusion: This study revealed that allergic rhinitis is one of the common ear, nose and throat diseases affecting all ages in our center. At presentation majority of the cases were associated with comorbid illnesses, complications and impact on quality of life. Early identification, referral of patient to a specialist for prompt treatment is very important to reduce morbidity.

Keywords: Allergic rhinitis, Allergens, ARIA classification, Quality of life, complication.



INTRODUCTION

Allergic rhinitis is an IgE-antigen and mast cell mediated (inflammation mediated) hypersensitivity reaction of the nasal mucosa to the allergens that is characterized by excessive sneezing, rhinorrhoea, nasal blockage and itching. It is a common sinonasal disorder and one of the most common disorders in otorhinolaryngological practice. It is a global public health problem. With various prevalence of 20% to 40% worldwide and the trend is known to be on increase¹⁻³. Allergic rhinitis is also the most common form of rhinitis, affects 20-40 million people in the United States annually^{4,5}. It affects 10-30% of adults and up to 40% of children also tend to be more prevalent among males during childhood, but the gender ratio among adults is approximately equal. Indirect costs from work productivity losses due to drowsiness and cognitive/motor impairment from sedating antihistamines are estimated to 6.7 billion dollars annually⁶.

During the early practice allergic rhinitis has traditionally been classified as either perennial or seasonal rhinitis^{7,8}. This depends on the kind of allergens that are responsible for the presenting symptoms^{9,10}. This classification is not satisfactory for many reasons. Based on these findings, the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines were published in 2001^{9-11,12,13}. This latest and new classification of allergic rhinitis has been proposed by the allergic rhinitis and its impact on asthma (ARIA) workgroup¹¹. The ARIA classification considers both the duration and severity of allergic rhinitis. Some studies have proved on the validation of the severity criteria proposed by the ARIA classification¹⁴.

Allergic rhinitis is a chronic multi organ disorder which involves inflammation of the mucous membranes of the nose, sinuses, ear, pharynx, larynx, bronchus and eyes in addition to the skin. This involves a complex interaction of inflammatory mediators which is ultimately triggered by an immunoglobulin E (IgE)¹⁵. This is mediated by response to an intrinsic or extrinsic protein called allergens. The allergens include house dust mites, pollen, cat, dog, and molds^{16,17}. On re-exposure to allergen, IgE is cross-linked, and this is the signal that leads to mast cell degranulation in the nasal mucous membrane¹⁶⁻¹⁸.

This process is divided into early and late phases

response. In the early phase response mediators that are immediately released include histamine, tryptase, chymase, kinins, heparin including other mediators like leukotrienes and prostaglandin D2¹⁹⁻²¹. All these mediators act through various interactions, causing symptoms like rhinorrhoea, sneezing and itching. Late phase response occurs over 4-8 hours. This also involves mediators' reaction which leads to the recruitment of other inflammatory cells to the mucosa. These inflammatory cells include neutrophils, eosinophils, lymphocytes, and macrophages²²⁻²⁴. The presenting symptoms are sneezing and itching which are less severe. Worse presenting symptoms are more congestion with mucus production and may persist for hours or days²²⁻²⁴.

Less is known about comorbid illnesses in allergic rhinitis²⁵⁻²⁷. A few previous studies have indicated that comorbidities in Western countries differ from those in Korean populations^{28,29}. In addition, assessing the comorbidities of allergic rhinitis may help clinicians to recognize symptoms of allergic rhinitis to achieve early and prompt treatment.

Allergic rhinitis affect up to 42% of the U.S. population by age 40, also leads to significant short-term and long-term medical complications. Poorly controlled allergic rhinitis may also contribute to the development of other related disease processes including acute and chronic sinusitis, recurrence of nasal polyps, otitis media/otitis media with effusion, hearing impairment, adenotonsillar hypertrophy with sleep apnea and related complications, aggravation and increased propensity to develop asthma³⁰⁻³³.

Poorly controlled symptoms of allergic rhinitis may contribute to sleep loss, secondary daytime fatigue, learning impairment, decreased overall cognitive functioning, decreased long-term productivity and decreased quality of life^{34,35}. Treatment of allergic rhinitis with sedating antihistamine therapy may result in poor quality of life^{34,35}.

The prevalence of allergies in Africa shows a consistent increase over a period of 7-10 years³⁶. In African epidemiological data are scarce and many patients do not recognize allergic rhinitis as a disease and therefore do not consult a physician³⁷. This study aimed at determining the prevalence, sociodemographic features, trigger factors, clinical

features, complications, quality of life, associated comorbid illnesses and treatment outcome among allergic rhinitis patients attending Ekiti state university teaching hospital.

Methodology:

This is a prospective hospital-based study of patients with clinical diagnosis of allergic rhinitis carried out at Ekiti state university teaching hospital Ado Ekiti, Ekiti state. The study was carried out over a period of 2 years from January 2014 to December 2016.

All consecutive patients who presented with features and diagnosis of allergic rhinitis to the ear, nose and throat department were enrolled into the study. Informed consent was obtained from patients/guardian/parents before they were enrolled into the study.

The instrument of data collection for this study was an open ended questionnaire that has been pretested. The information collected from patients included their demographic features, clinical presentation, duration of symptoms, frequency of symptoms and triggering factors. Detailed otorhinolaryngological history was taken from the patients and from guardian or parents for children who cannot give history by themselves. Also detailed history on possible comorbid illnesses, complication, aetiological and predisposing factor for allergic rhinitis was taken. Past medical, surgical, family and social history were taken. All the patients had general physical and systemic examination done. A thorough nose, ear, throat, head and neck examination were done and documented on the patients. Thorough rhinological examination includes anterior rhinoscopy and posterior rhinoscopy was carried out. Sinonasal discharge was aseptically taken examined and sent for microscopy, culture and sensitivity. Radiological investigations such as plain x ray and computerised tomographic scan of the paranasal sinuses were requested based on clinical findings this is to show the level of involvement of the nasal cavities, paranasal sinuses and the post nasal space. Haematological test like full blood count looking for eosinophilia and nasal smear for cytology were carried out. Patient subsequently had medical, surgical or combined form of treatment based on their findings. Participants were followed up in the ear, nose and throat clinic for possible outcome and complications.

All data obtained were documented, collated and analyzed. The data analysis was done using SPSS version 16.0. and were expressed in simple descriptive methods with tables, bar chart and pie chart.

Ethical approval was considered and obtained from the ethical committee of the institution.

Results

During the study period, a total of 4,341 patients were seen at ear, nose and throat department. Of these, 305 patients had a clinical diagnosis of Allergic rhinitis. Thus, the prevalence of allergic rhinitis in this studied population represents 7.0%.

The age group distribution of the patients was demonstrated in Table.1. All the studied age group had allergic rhinitis. The highest number of Allergic rhinitis was recorded among the age group of 0- 10 years accounting for 101 (33.1%) patients in this study.

Table 2. Showed the sociodemographic characteristics of our patients, there were 192 (63.0%) males and 113 (37.0%) females given a male: female ratio of 2:1. Majority of the participants 273 (89.5%) were Christian while 30 (9.8%) practices Islam. Majority (30.5%) of our patients were in the Preschool followed by tertiary education level accounting for (20.3%). Students/apprentice 144 (47.2%) and farmers 48 (15.7%) constituted the majority of the occupation group. Large percentages (48.2%) of our patients were single.

Features of allergy among the patients were demonstrated in table 3. Most patients in this study 271 (88.9%) were able to identify their allergens (triggers). Major triggers factors were dust 232 (76.1%) and smoke 219 (71.8%). Other triggering factors were soap 55 (18.0%) and body cream 11 (3.6%). By ARIA Classification of allergic rhinitis in this study were mainly 167 (54.8%) moderate severe persistent and 59 (19.3%) moderate severe intermittent. Perennial and seasonal allergic rhinitis in this study were noted to be 138 (45.2%) and 167 (54.8%) respectively. There was family history of allergic rhinitis in 178 (58.4%) patients. Symptoms in the patients were illustrated in figure 1. All the patients presented with nasal symptoms, which includes nasal blockage in 267 (87.5%) patients, 233 (76.4%) had runny nose and 198 (64.9%) bout of sneezing. The extra nasal

nasalsymptoms recorded in our patients were itchy eye, itchy ear and itchy throat accounted for 191 (62.6%), 193 (63.3%) and 134 (43.9%) respectively.

The clinical sign among the patients was shown in fig 2. The commonest clinical finding in our patients includes oedematous mucosa 222 (72.8%), enlarged turbinate 205 (67.2%) and reduced nasal patency 161 (52.8%).

The comorbid illnesses among allergic rhinitis patients were demonstrated in fig. 3. Majority of the patients had one or more form associated comorbid illnesses associated with allergic rhinitis. These include 69 (22.6%) tonsillar enlargement from recurrent tonsillitis, 54 (17.7%) adenoid hypertrophy and 48 (15.7%) inferior turbinate hypertrophy.

In this study population allergic rhinitis is associated with different types of complications and the major one were pharyngitis, otitis media and headache as accounting for 107 (35.1%), 97 (31.8%) and 86 (28.2%) respectively. Quality of life among the patients was demonstrated in table 4. Majority of the studied patients admitted that allergic rhinitis have interference with their daily activities. The main quality of life affected includes sleep disturbance, social functioning and depression which accounted for 114 (37.4%), 99 (32.5%) and 75 (24.6%) respectively. Others were 15 (4.9%) fatigue, 19(6.2%) psychological disorders inform of anxiety and 22 (7.2%) sexual dysfunction.

In this study of allergic rhinitis radiologic request were made based on the patient's condition. This included plain x-rays and CT scan of paranasal sinuses in only 192 (63.0%) patients. The radiological findings on the paranasal sinuses were normal in 52 (17.0%) while the remaining 140 (45.9%) revealed different form of abnormalities in the nasal cavity and paranasal sinuses. They included enlarged inferior turbinate, haziness, air-fluid levels, mucosal thickening and polyps. The orders of paranasal sinuses affectation were maxillary, ethmoid, frontal and sphenoid sinuses.

The surgery among the patients was illustrated in table 5. Our patients were treated both surgical and nonsurgical (conservatively). Nonsurgical treatments were offered to 164 (53.8%) patients. Different forms of

surgical intervention were performed on the patients due to the associated complications or comorbid illnesses with allergic rhinitis. Most frequently type of surgical procedure performed in this study were 82 (26.9%) antral lavage, 61 (20.0%) partial turbinectomy and 29 (9.5%) tonsillectomy. The average hospital stay for the admitted surgical patients ranged from 1 to 4 days. Surgical complications were recorded in 13 (4.3%) patients. No mortality was recorded in this study.

Table 1. Age groups distribution of allergic rhinitis patients

Age groups (years)	Number	Percentage (%)
1-10	101	33.1
11-20	38	12.5
21-30	81	26.6
31-40	53	17.4
41-50	8	2.6
51-60	18	5.9
>60	6	1.9

Table 2. Sociodemographic features of the allergic rhinitis patients (N = 305)

Sociodemographic features	Number	Percentage (%)
Sex		
Male	192	63.0
Female	113	37.0
Religion		
Islam	30	9.8
Christianity	273	89.5
Others	2	0.7
Level of education		
Nil	42	13.8
Pre school	93	30.5
Primary education	52	17.0
Secondary education	56	18.4
Tertiary education	62	20.3
Occupation		
Students/apprentice	144	47.2
Applicant	29	9.5
Business	26	8.5
Teachers	25	8.2
Farming	48	15.7
Health workers	30	9.8
Others	3	1.0
Widow		

Table 3. Features of allergic among allergic rhinitis patients (N=305)

Allergic features	Number	Percentage (%)
Triggers of the symptoms		
Dust	232	76.1
Direct breeze	120	39.3
Cold	190	62.3
Perfume	164	53.8
Smoke	219	71.8
Seafood	85	27.9
Soap	55	18.0
Body cream	11	3.6
ARIA Classification		
Mild-Intermittent	40	13.1
Moderate-Severe intermittent	59	19.3
Mild-Persistent	39	12.8
Moderate-Severe Persistent	167	54.8
Traditional classification		
Seasonal	167	54.8
Perennial	138	45.2
Family history		
Present	178	58.4
Absent.	127	41.6

Figure 1. Symptoms in the allergic rhinitis patients

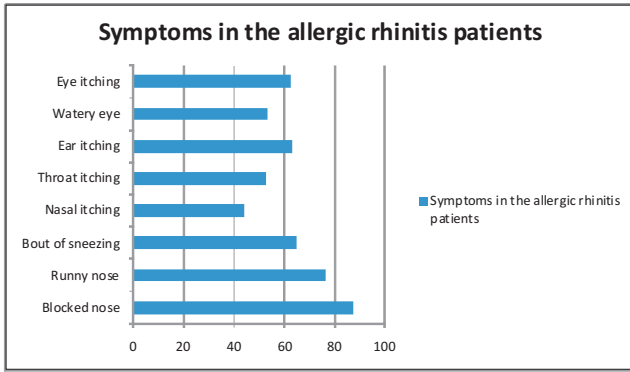


Figure 2. Sign among allergic rhinitis patients

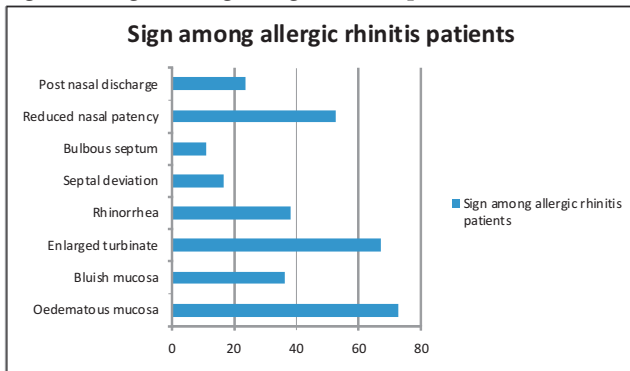


Figure 3. Comorbid illnesses among allergic rhinitis patients.

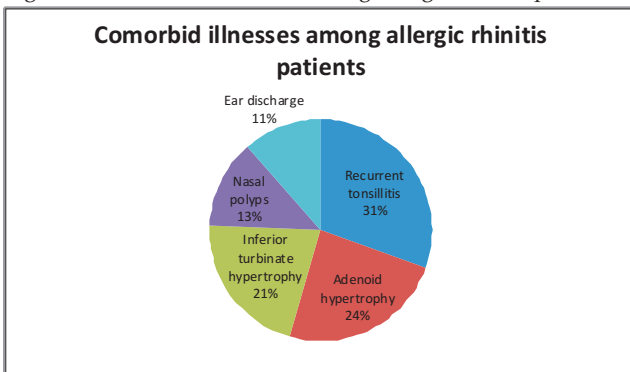


Table 4. Quality of life among allergic rhinitis patients

Quality of life	Number	Percentage (%)
Sleep disturbances	114	37.4
Daily activities interference	24	7.9
General health	49	16.1
Psychological disorders	19	6.2
Social functioning	99	32.5
Changes in mood	41	13.4
Depression	75	24.6
Anxiety	38	12.6
Fatigue	15	4.9
Sexual dysfunction	22	7.2

Table 5 Surgery among the allergic rhinitis patients

Surgery	Number	Percentage (%)
Antral lavage	82	26.9
Turbinectomy	61	20.0
Tonsillectomy	29	9.5
Adenoidectomy	20	6.6
Polypectomy	9	3.0
Caldwell luc	12	3.9

Discussion

Allergic rhinitis is one of the major health problems in otorhinolaryngological practice in Ekiti state affecting all ages. It has also been documented as a global health challenges. In this studied population the prevalence of allergic rhinitis was found to be 7.0%. This prevalence is lower in this study centre compared to recorded prevalence of allergic rhinitis in other study which ranges from 10%-40%^{38,39}. Low prevalence of allergic rhinitis in this study is underestimated because majority of patients with allergic rhinitis results to self-medication, herb medication or treated in the peripheral hospitals. Only few complicated cases or those with comorbid illnesses are referred or present to otorhinolaryngologist. Higher prevalence of allergic rhinitis have been reported in developed and industrial study such as USA and some part of African countries^{39,40}. A true prevalence of the allergic rhinitis in this studied region requires comprehensive population-based study.

Despite all the ages that were affected by allergic rhinitis in this study, majority of patients were children when compared to adults. This may be due to high prevalence of early onset of allergic rhinitis in the patients. This high prevalence may be due to the fact that allergic rhinitis is associated with comorbid illnesses, complications and troublesome recurrent respiratory viral infections. These usually compelled parents to seek medical intervention. The allergic rhinitis in adult are commonly ignored due to mild symptoms and occasionally uncommon associated respiratory viral infections. There is male preponderance in this study and other study also reported similar male predominance⁴¹. These findings is however in variant to other studies which reported female predominance^{40,42}. Other study of allergic rhinitis also revealed no gender predilection in their findings⁴³.

Traditional classification of allergic rhinitis into seasonal or perennial in this study revealed higher proportion of seasonal allergic rhinitis over perennial allergic rhinitis. This proof the high prevalence of inhalational trigger factors in this study as demonstrated in previous study⁴⁴. ARIA classification based on symptom duration (intermittent or persistent) and severity (mild, moderate or severe) was also used in categorizing the study population. Symptoms findings of moderate/severe of both persistent and intermittent type were commoner in the study population than the mild type. This is important to classify the severity and duration of symptoms as this will guide the management approach for

individual patients and is similar to findings in other studies^{15,45}.

Majority of the study patients were self-reported allergic to inhalant allergens. Inhalant allergens include dust, perfumes and smoke. The common inhalant allergens in this study were dust, perfumes and smoke. Similar findings were reported in other study³⁴.

Allergic rhinitis occurs in patients with a genetic predisposition to developing allergy. There is family history of allergic rhinitis in most of the study population. Nasal symptoms in allergic rhinitis can be triggered by environmental factors. The commonest environmental factor demonstrated in this study was inhalational trigger factor.. In this study exposure to dust, cold, perfume and smoke were the most common self-reported triggers for allergic rhinitis. Clinical presentation of allergic rhinitis in this study includes runny nose (rhinorrhoea) in high percentage of the patients compared to other studies^{46,47}. This is due to allergic stimulation nasal mucosal goblet cell and superimposed viral and bacteria infection commonly in children. Nasal blockage or obstruction is another common symptom of allergic rhinitis in this study. This is secondary to nasal mucosa oedema, adenoid hypertrophy, inferior turbinate hypertrophy and nasal polyps (few) in patients in this study population. Allergic rhinitis symptoms such as sneezing develop within minutes or hours after breathing in an allergen. Sneezing is nasal reflex to expel mucus, irritant or allergens and cleanse the nasal cavity. The sneezing are repeated and can last for days. As in this study sneezing start as soon as you breathe in an allergen: dust, smoke and perfume. Also sneezing may occur after waking up in the morning.

Allergic rhinitis has significant associated comorbid illnesses or disorders such as asthma, eczema, sinusitis, conjunctivitis and adenoid hypertrophy. In this study, majority of the patients presented to the department because of the associated comorbid illnesses. This difference may be due to good environmental control of allergens, difference in genetic component, people perception of allergic rhinitis, prompt treatment and early treatment of allergic rhinitis.

Allergic rhinitis when extended beyond the nasal mucosal lining it is said to be complicated. This occurs

in poorly controlled, non treated long standing allergic rhinitis or when associated with superimposed infection (viral, bacterial or fungal). This leads to the development of other disease processes such as orbital complications, sinusitis, nasal polyps, otitis media, otitis media with effusion, hearing impairment, abnormal craniofacial development, obstructive sleep apnea and aggravation of underlying asthma^{48,49}. The classic symptoms of allergic rhinitis such as sneezing, rhinorrhoea and nasal obstruction may impair the quality of life in the patients. The quality of life in the patients includes: disrupt sleep, interference with daily activities, psychological disorders, social functioning, changes in mood, depression, anxiety, fatigue, and sexual dysfunction. Sleep disturbances caused by nasal blockage was a major complaint in this study and it leads to fatigue, daytime sleepiness, irritability and memory deficit. This observation was also noted in other studies^{50,51}. Allergic rhinitis also interfered with social functioning of our patients such as playing, entertainment and working. The reported interference with social functioning resulted from severe symptoms of repeated bout of sneezing, nasal blockage, snoring and rhinorrhoea which also causes embarrassment to patients in social activities.

Management of allergic rhinitis required multidisciplinary approach for effective treatment outcome. This is required because allergic rhinitis is associated with comorbid illnesses, complications and impact on quality of life. The specialist include radiologist, paediatricians, psychiatrist, family physician, allergists and otorhinolaryngologists^{52,53}. The treatment of allergic rhinitis consist of allergen avoidance which is effective but practically difficult^{52,53}. In addition, medical treatment with steroids and antihistamines were also employed. Surgical therapy is reserved for complication and comorbid illnesses. Immunotherapy may also be used but not commonly used in the study center. It is paramount for patients to know that all treatment cannot cure allergic rhinitis. This was similar to other study on allergic rhinitis^{53,54}.

Majority of the patients had surgical treatment because at presentation there were associated complications and comorbid illnesses. This findings is similar to the observation in other study^{54,55}. The most common indications for surgical treatment of allergic rhinitis in this study were adenoid hypertrophy, sinusitis, orbital complication, recurrent tonsillitis, inferior turbinate hypertrophy and nasal polyps.

It is paramount for patients to know that all treatment

cannot cure allergic rhinitis. Majority of the patients were not happy with the fact that allergic rhinitis has no cure. In this study all patients noticed improvement at first week follow up visit as evidence by markedly reduction in their symptoms (excessive sneezing, nasal blockage, rhinorrhea and itchiness). Our patients had complications or comorbid illness but usually mortality associated with allergic rhinitis are uncommon as also reported from other studies⁵⁶⁻⁵⁷.

Conclusion:

This study revealed that allergic rhinitis is one of the common ear, nose and throat diseases affecting all ages in our center. At presentation majority of the cases were associated with comorbid illnesses, complications and impact on quality of life. Early identification, referral of patient to a specialist for prompt treatment is very important to reduce morbidity. It is therefore recommended that public enlightenment, further local and national study on allergic rhinitis in Nigeria is necessary.

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