

Health-Related Quality of Life and its contributory factors in Allergic rhinitis patients in Nigeria

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Abstract

Objectives

To determine the health-related quality of life (HRQoL) in allergic rhinitis patients as well as identify contributory factors to patient's well-being.

Methods

Cross sectional study by multistage sampling. Four month study duration (October, 2013 to January, 2014). The setting of study was Kwara state, Nigeria which has 16 Local Government areas with 3 senatorial districts, total land mass of 36,825 km² with population of 2,591,555. 132 consenting adults; 66 of them have allergic rhinitis (AR) using Score for Allergic Rhinitis (SFAR) instrument and 66 were age and gender matched controls. ($\chi^2 = 0$, d.f. =1, P=1 and $\chi^2 = 1.24$, d.f. =2, P=0.54 respectively). Information on HRQoL was obtained using the 14-parameter mini Rhinoconjunctivitis quality of life questionnaire (mini-RQLQ). Socio-demographic variables possibly contributory to patient's well-being were obtained. Kruskal- Wallis and Mann-Whitney U tests were used to compare means.

Results.

The overall Total Symptom Score (TSS) was 3.37 ± 0.9 , while male and female allergic patients and control TSS were 3.61 ± 1.0 ; 3.16 ± 0.8 , and 0.98 ± 0.2 ; 0.95 ± 0.2 respectively. Effects of gender, marital status, senatorial districts, residential area and duration of symptoms had significant impact on the quality of life. The highest correlation with TSS and components of mini-RQOL questionnaire existed between nasal problems and other symptoms ($r = 0.866$; 0.868).

Conclusion.

AR had appreciable impact on HRQoL of the participants. Gender, number of dependents, marital status, senatorial districts, residential area and duration of symptoms were major identifiable contributory factors to the patient's well-being.

Key words. Allergic Rhinitis, Health-Related Quality of Life (HRQoL), Nigeria.

Introduction

Allergic rhinitis refers to a chronic clinical condition which involves inflammation of the nose and paranasal sinuses. While worldwide prevalence is varied, a recent hospital based study done in North-Central Nigeria reported 31.6%.¹ Despite the availability of medications to control the disease and thus minimize the morbidity, misdiagnosis and underdiagnosis of the condition still arises leading to an undermining of the severity of the impact of the disease.

It becomes important therefore to determine the severity of the disease using Patient-reported Treatment Outcomes (PTO), which are based on the perception of the disease by the recipients. This fact has been identified by the World Health Organization (WHO) sponsored document, Allergic Rhinitis and its Impact on Allergy (ARIA).² The single most important aspect is the Health-Related Quality of life (HRQoL). This relates to the overall quality of life which has been shown to affect healthcare.³ It refers to a broad concept which is based on the patient's subjective assessment of the impact of the disease or the treatment being received on account of the disease.⁴

The instruments used to obtain HRQoL information, can either be generic or disease-specific in nature.⁵ The generic instruments are designed to be used for patients with general health states, thus comparison is often easier. Such examples include Medical Outcomes Survey Short Form 36 (SF-36),⁶ Nottingham Health profile (NHP).⁷ Despite the advantages, the major drawback of the generic instruments is the inability to measure specific peculiarities inherent in each disease. The other type of instrument is the disease specific instrument. These are designed to address the deficiencies noted in the generic instruments and thus tend to be more sensitive to changes in patient's symptoms. An example of this is the Mini-Rhinoconjunctivitis Quality of life questionnaire (mini-RQLQ)⁸ which is a 14-item instrument which has strong measurement properties and measures the same construct as the original 28-item Rhinoconjunctivitis Quality of life questionnaire (RQLQ).⁹

Kwara state is located within the North-Central geopolitical zone of Nigeria, one of the six zones in the country. The state has 16 Local Government areas with 3 senatorial districts, a total land mass of 36,825 km² with a population of 2,591,555¹⁰. The senatorial districts are namely; Kwara Central, Kwara South and Kwara North. Each of the districts has its own individual peculiarities. The most affluent of these is the Kwara Central, where the state capital is located and largest concentration of healthcare facilities are sited.

The study aims at determining the health-related quality of life (HRQoL) in allergic rhinitis patients in our study population and identify contributory factors to patient's well-being in both rural and urban communities in Kwara state, Nigeria.

Materials and Methods

Study Design: The study was a community based cross sectional study carried out in selected local government areas (LGAs) in Kwara state, Nigeria. Ethical approval was sought and obtained from the Ethics committee of the Ministry of Health, Kwara state prior to the commencement of the study. The study was over a 4 month period (October, 2013 to January, 2014).

The inclusion criteria for the study were; adults > 18 years of age who were diagnosed with allergic rhinitis using Score For Allergic Rhinitis (SFAR), a validated instrument for making a diagnosis of allergic rhinitis, based on the study of Annesi-Maesano et al.¹¹ This involved the use of parameters such as nature of symptoms, presence of Rhinoconjunctivitis, presence of trigger factors, months of the year affected, perceived allergic status, previous medical diagnosis of allergy, previous positive tests and family history of allergy. Each of these parameters have attributed weighted scores which add up to a maximum score of 16. A diagnosis of *allergic rhinitis* is based on a score of ≥ 8 , while < 8 is diagnosed *non allergic*. The study group were matched for age and sex by selecting respondents who were > 18 years but diagnosed non allergic based on SFAR. These formed the control group. Participants who were > 18 years of age and failed to give signed informed consent were excluded from the study. The sample size was derived using the Fishers formula.¹

Sampling technique was carried out in four stages using multistage sampling technique. In stage one, nine of the sixteen local government areas in Kwara state were chosen by simple random sampling using simple balloting. In stage two, 2 communities were chosen from each of the nine selected LGAs, by simple random sampling using the table of random numbers. In stage three, proportionate allocation was used to allocate the proportion of households that will be sampled in each (of the eighteen) community chosen based on the population of households in the community. In stage four, systematic sampling was used to determine the sampling interval for the houses in the communities sampled.

In each household visited, every first adult (aged >18 years) met was approached and the study (including the purpose, scope, possible benefits and associated risks) was explained to

the subject. Informed consent was obtained from subjects. When there was a decline, the next eligible adult in the same household was approached.

A total of 66 participants were diagnosed to have allergic rhinitis out of the 289 respondents sampled. These formed the group 1. They were matched for age and sex from the rest of the respondents who had no allergic rhinitis, and 66 controls were obtained (also from the rest of the 289 respondents). These formed group 2.

Research Instruments: Data were generated from information obtained from the participants using two major instruments by the researchers. The first instrument included the Score for Allergic Rhinitis (SFAR), a validated instrument for making a diagnosis of allergic rhinitis, based on Annesi-Maesano et al,¹¹ (Appendix 1) together with other socio-demographic characteristics. The other instrument used was the Mini-Rhinoconjunctivitis Quality of Life questionnaire (mini-RQLQ) (Appendix 2). This instrument involves fourteen items which are grouped into five sub-groups, namely; activity limitation, practical problems, nasal symptoms, eye symptoms and other symptoms. The overall classification was recorded as Total Symptom Score (TSS).

Data was collated and analysed using SPSS statistical package (version 18, Chicago, IL). Differences between categorical variables were explored using the Chi-square test, while Kruskal-Wallis and Mann Whitney U tests were used to test the significance of the various possible contributory factors associated with well-being in allergic rhinitis patients. All analyses were done with statistical significant level of $\alpha = 0.05$.

Results

A total of 132 adult participants were seen during the study period. Sixty six of these were diagnosed to have allergic rhinitis, (AR) using the Score for Allergic Rhinitis (SFAR) instrument and 66 were age and gender matched controls ($\chi^2 = 0$, d.f. =1, P=1 and $\chi^2 = 1.24$, d.f. =2, P=0.54 respectively). The number of males and females in each group were 30 and 36 respectively. The mean age of the participants was also similar; 37.6 ± 10.0 (Allergic) and 35.5 ± 9.1 (Non-Allergic). Total Symptom Score (TSS) for allergic patients using the mini-RQLQ questionnaire was 3.37 ± 0.9 with a value of 3.61 ± 1.0 for male and 3.16 ± 0.8 for female while for the non-allergic, the values were 0.98 ± 0.2 (males) and 0.95 ± 0.2 (females) (Table1).

Table 1; Socio-demographic Characteristics of the Participants.

Parameter	Allergic Participants	Non-Allergic Participants	
Gender of participants	n=66 (%)	n=66(%)	χ^2 (p-value)
Male	30 (45.5)	30 (45.5)	
Female	36 (54.5)	36 (54.5)	
Age range (years)			
20 – 29	20 (30.3)	21 (31.8)	0.144 (0.986)
30 – 39	20 (30.3)	21 (31.8)	
40 – 49	22 (33.3)	20 (30.3)	
50 – 59	4 (6.1)	4 (6.1)	
Mean \pm SD	37.6 \pm 10.0	35.5 \pm 9.1	
Marital status			
Single	6 (9.1)	8 (12.1)	4.602 (0.100)
Married	60 (90.9)	54 (81.8)	
Widowed	0 (0)	4 (6.1)	
LGA grouping according to Senatorial districts			
Kwara central	20 (30.2)	22 (33.3)	0.182 (0.913)
Kwara north	22 (33.3)	22 (33.3)	
Kwara south	24 (36.5)	22 (33.4)	
Total symptom scores (TSS)			
Male	3.61 \pm 1.0	0.98 \pm 0.2	
Female	3.16 \pm 0.8	0.95 \pm 0.2	

* significant p-value (p<0.05)

Table 2: Levels of Quality of Life of Allergic Patients by the Components of the Mini Rhinoconjunctivitis (mRQOL) Questionnaire Sub-group

Levels	Activity limitation n=66 (%)	Practical problems n=66 (%)	Nose symptoms n=66 (%)	Eye symptoms n=66 (%)	Other symptoms n=66 (%)	Total score n=66 (%)
0 – 1.0 (Not troubled)	4 (6.1)	0 (0.0)	0 (0.0)	2 (3.0)	0 (0.0)	0 (0.0)
1.1–2.0 (Hardly troubled)	8 (12.1)	4 (6.1)	6 (9.1)	10 (15.2)	22 (33.3)	4 (6.1)
2.1–3.0 (Somewhat troubled)	20 (30.3)	26 (39.4)	16 (24.2)	26 (39.2)	22 (33.3)	16 (24.2)
3.1–4.0 (Moderately troubled)	8 (12.1)	16 (24.2)	24 (36.4)	16 (24.2)	8 (12.1)	32 (48.5)
4.1–5.0 (Quite a bit troubled)	18 (27.3)	8 (12.1)	16 (24.2)	12 (18.2)	12 (18.2)	14 (21.2)
5.1 – 6.0 (Very troubled)	8 (12.1)	12 (18.2)	4 (6.1)	0 (0.0)	2 (3.0)	0 (0.0)
Overall score (± SD)	3.5 (1.4)	3.8 (1.3)	3.7 (1.1)	3.1 (1.1)	2.9 (1.2)	3.37 (0.9)

Table 3: Significance of the Various Contributory Factors on the Components of the Mini Rhinoconjunctivitis Questionnaire Sub-group

Factors	Activity limitation (p value)	Practical problems (p value)	Nose symptoms (p value)	Eye symptoms (p value)	Other symptoms (p value)	Total score (p value)
Age	0.014*	0.986	0.136	0.810	0.048	0.215
Gender	0.531	0.003*	0.601	0.378	0.001*	0.016*
Marital status	0.049*	0.319	0.024	0.388	0.001*	0.016*
Educational status	0.109	0.475	0.024*	0.071	0.275	0.096
Number of dependents	0.001*	0.359	0.073	0.447	0.043*	0.012*
LGA Groups – Senatorial District	0.005*	<0.001*	0.006*	0.007*	0.003*	0.001*
Residential area	0.087	0.001*	<0.001*	0.007*	<0.001*	<0.001*
Co-Morbidity (Asthma)	0.553	0.977	0.003*	0.116	0.977	0.208
Allergy Type (PAR/IAR)	0.322	0.444	0.042*	0.653	0.735	0.188
Duration of AR symptoms	0.423	<0.001*	0.005*	0.001*	0.003*	<0.001*

* Statistically significant p – values (p < 0.05)

PAR- Perennial Allergic Rhinitis; **IAR** – Intermittent Allergic Rhinitis

Table 4: Inter-item Correlation between the Components of the Mini Rhinoconjunctivitis Questionnaire sub-group.

	Activity limitation (p -value)	Practical problems (p-value)	Nasal symptoms (p - value)	Eye symptoms (p -value)	Other symptoms (p -value)	Total score (p -value)
Activity limitation	1	0.360 (0.003*)	0.486 (<0.001*)	0.217 (0.080)	0.410 (0.001*)	0.675 (<0.001*)
Practical problems	0.360 (0.003*)	1	0.585 (<0.001*)	0.381 (0.002*)	0.587 (<0.001*)	0.718 (<0.001*)
Nasal problems	0.486 (<0.001*)	0.585 (<0.001*)	1	0.645 (<0.001*)	0.673 (<0.001*)	0.866 (<0.001*)
Eye problems	0.217 (0.080)	0.381 (0.002*)	0.645 (<0.001*)	1	0.703 (<0.001*)	0.750 (<0.001*)
Other symptoms	0.410 (0.001*)	0.587 (<0.001*)	0.673 (<0.001*)	0.703 (<0.001*)	1	0.868 (<0.001*)
Total score	0.675 (<0.001*)	0.718 (<0.001*)	0.866 (<0.001*)	0.750 (<0.001*)	0.868 (<0.001*)	1

* Statistically significant p – values (p < 0.05)

About 70% of the patients with AR (46/66) had mini-RQLQ values of 3 to 5 TSS scores (moderately troubled to quite a bit troubled) for quantifying the health-related quality of life (Table 2). Significant p-values were obtained for gender, marital status, number of dependents, senatorial districts, residential area and duration of symptoms (p=0.016, 0.016, 0.012, 0.001, <0.001 and <0.001 respectively). Senatorial districts, residential area and

duration of symptoms were noted to have significant p-values for almost all the 5 components of the mini-RQLQ (Table 3).

Essentially all the various components of the mini-RQLQ correlated significantly with TSS values ($p < 0.001$) (Table 4). Nasal and other symptoms are more related to the Total Symptom Score (TSS) than any other components ($r = 0.866$ and 0.868 respectively). The highest correlation between the components of the mini-RQLQ existed between eye problems and other symptoms ($r = 0.703$).

Discussion

The study noted that allergic rhinitis had a significant effect on the health-related quality of life of individuals diagnosed as suffering from allergic rhinitis as compared with matched controls in Kwara state, Nigeria. The major contributory factors to worsening of health-related quality of life of the individuals with allergic rhinitis were found to be respondent's residential area and the duration of the respondent's allergic symptoms. Nasal symptoms as well as the other symptoms were noted to be most related to Total Symptom Score (TSS) based on the mini Rhinoconjunctivitis Quality of Life (mini-RQLQ) questionnaire.

There was a female preponderance found in this study (M: F ratio, 1:1.2). This was in keeping with the findings of a study carried out in North-Central Nigeria¹² (73% female preponderance) and Turkey, where the male to female ratio was 1 : 1.1.¹³ Some other studies have however reported a larger male to female ratio.¹⁴⁻¹⁶ The difference may be a representation of the findings in the general population where, according to the 2006 National Census figures in Nigeria, there is a slight female preponderance.¹⁷ Total Symptom Score (TSS) for allergic patients using the mini-RQLQ was 3.37 ± 0.9 with a male value of 3.61 ± 1.0 and female value of 3.16 ± 0.8 . The TSS refers to the total overall average of the 5 parameters of the mini-RQLQ (namely, activity limitation, practical problems, nasal symptoms, eye symptoms and other symptoms). The finding is significantly higher than that of 1.54 ± 1.06 reported by Small et al,¹⁸ from a cross-sectional cohort study amongst primary care physicians and allergy specialists in France, Germany and Spain. The difference might be due to the involvement of both perennial and intermittent AR patients in the index study. Also the significant difference might have been caused by the community based nature of this present study.

The duration of AR symptoms was found to be significant in all mini-RQLQ components ($p < 0.001$) except for activity limitation component ($p = 0.423$). While the type of allergy (either persistent or intermittent allergic rhinitis) was only significant for nasal symptoms ($p = 0.042$), but not for other aspects of the mini-RQLQ components. The severity and duration of rhinitis has been reported to have an impact on the quality of life and visual analogue scores (VAS) of AR patients.¹⁹ However, the study carried out by Bousquet et al,²⁰ reported that only severity of AR symptoms and not its duration, affected the clinical profile of the patients. This study noted that 80% of the patients with more severe forms reported an impairment in activity when compared with 40% with mild forms.

The presence of co-morbidities in the AR patients (Asthma was the major one studied), was only significant on the nasal symptoms ($p = 0.003$) but not for the other aspects of the mini-RQLQ. This finding is similar to a study evaluating the impact of AR on the quality of life of asthmatics in Turkey.²¹ The study involved 232 patients with AR, 40 patients with asthma and 44 patients with both diseases and concluded that the impact of AR on asthma only played a minor role. This finding was further corroborated by the findings of Leynaert et al,²² whose study showed that asthma was not found to significantly impair the quality life of AR patients in terms of mental disability and well-being. However, contrary to these findings Aydemir et al,²³ in a comparative hospital-based study, noted that respiratory allergic diseases had detrimental effects on quality of life. Thus, due to the similarity in the pathophysiology of the two conditions, it has been corroborated that AR treatment reduces the incidence and severity of asthma.²⁴ In fact, Maspero J et al²⁵ in the study involving AR patients in Western Europe and the United States, reported a significant number of AR patients with concomitant asthma, hence justifying the inclusion of asthma in formulating AR control.

The senatorial districts and the residential area where the respondents with significant mini-RQLQ findings reside (in almost all 5 domains) appeared to be a major contributory factor to the HRQoL ($p = < 0.001$ to 0.007). This may be related to the availability of and accessibility to healthcare in the state. Kwara central senatorial district had the largest concentration of healthcare services (primary, secondary and tertiary), and had the lowest amount of AR patients. Apart from the public hospitals, private hospitals also tend to be concentrated within the Kwara central district. Abodunrin et al²⁶ in a study carried out in Kwara state on the preferred choice of healthcare facilities among adult residents, opined that due to the availability of quick service and drugs, private hospitals were preferred to public ones and that higher levels of health care were preferred to primary ones. The study also noted that

gender, occupation and city area of residence were all associated with the preferred choice of health care.

One of the most cogent findings in the study was that most of the components of the mini-RQLQ correlated significantly with TSS values ($p < 0.001$). Nasal and other symptoms were noted to be more related to the Total Symptom Score (TSS) than any other components ($r = 0.866$ and 0.868 respectively). This suggests that while all components of mini-RQLQ are important correlates of overall symptom, nasal as well as other symptoms were better correlates or determinants. Hence, nasal symptom component of mini-RQLQ questionnaire may then be used for preliminary assessment of RQLQ. It was noted that an increase in the level of nasal symptoms resulted in an increase in the overall symptom score.

The main limitation of this study was the fact that there was no re-evaluation of the mini-RQLQ questionnaire in the respondents after treatment. Also the study did not administer any AR medication as part of the research protocol or evaluate its effect on the patient's quality of life. This is because apart from the instrument identifying the HRQoL, it also has the ability to detect changes over time and the efficacy of treatment given.²⁷ However that was not the aim of this study. Further research may therefore be required to evaluate whether changes (improvement or deterioration) in the quality of life of AR patients occurs with improvement in the various identifiable contributory factors.

Conclusion / Significance

Allergic Rhinitis had appreciable impact on the health-related quality of life of the subjects with AR who participated in this study. Gender, marital status, senatorial districts, residential area and duration of symptoms were major identifiable contributory factors to the patient's wellbeing.

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Conflict of Interest

The authors declare that there are no conflicts of interest in carrying out this research.

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