

# Health-related quality of life among patients with bronchial asthma in Ile-Ife, Nigeria

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## Introduction

Asthma is a disease with increasing global significance. It is estimated that by the year 2025, the prevalence will have risen from the current 300 million to 400 million worldwide.<sup>1</sup>

Developing regions of the world are also experiencing increased prevalence mainly as a result of increasing urbanisation and tendencies toward environmental pollution. Adequate and correct assessment of the disease thus becomes paramount, particularly in resource-challenged areas such as Nigeria. Spirometric indices, symptoms, number of acute exacerbations requiring hospital admissions, and peak expiratory flow measurements have been the common means of monitoring the disease.<sup>2</sup>

Other parameters for assessment include the 6-minute walk test, with assessment of dyspnoea rating and six-minute walk distance which has been found to be a good one-time measure of exercise tolerance.<sup>3</sup> In recent times, spirometric assessment has been complemented with quality of life measures<sup>4</sup> using parameters which assess the impact of asthma from the patient's point of view, with evidence suggesting this to be a measurable and reproducible outcome.<sup>5,6</sup> Although some studies have looked at outcomes such as mortality and psychosocial morbidities,<sup>7,8</sup> few reports have been published that focus on health-related quality of life (HRQoL) in asthma patients in Africa, and particularly Nigeria, as a means of complementing spirometric indices, which is still grossly underutilised in most regions. We present the results of a study to assess levels of HRQoL among a sample of asthma patients in a semi-urban population of south-western Nigeria.

## Subjects and methods

### Study design

We conducted a cross-sectional study of all patients with spirometrically confirmed asthma, aged 17–75 years, who attended the outpatient respiratory clinic of a tertiary referral centre in south-western Nigeria between

September 2008 and June 2009. The study was designed to have 95% power to detect a difference of 4 in the St George's Respiratory Questionnaire (SGRQ) scores outcome between subscales, and the total scores, assuming a two-sided significance test and a type 1 error of 5%. The study was approved by the ethical committee of the Obafemi Awolowo University Teaching Hospital and all subjects provided written informed consent.

### Setting and study participants

The study was carried out at the respiratory unit of the Department of Medicine of Obafemi Awolowo University Teaching Hospital Complex, which combines primary, secondary, and tertiary care services. The hospital is located in Ile-Ife and is the catchment for three states in south-western Nigeria.

To be eligible, patients had to have spirometric evidence of asthma as defined by an increase of more than 15% in FEV<sub>1</sub> (forced expiratory volume in 1 second) and/or 200 ml, 20 minutes after inhalation of 400 µg of β-2 agonist (salbutamol). Of the 71 patients who met this criteria, we excluded 16 who had other medical conditions (hypertensive heart failure, chronic kidney disease, etc) that could contribute to dyspnoea or exercise limitations, and patients presenting in acute severe asthma.

The socio-demographic data, clinical history, and examination results were collated using the Medical Research Council questionnaire.<sup>9</sup>

### Health-related quality of life

We used the SGRQ to measure the HRQoL. This self-administered questionnaire, which measures the impact of respiratory conditions on health status, consists of 50 items with 76 weighted responses and gives rise to three subscales: distress due to respiratory symptoms (the symptoms scale), disturbance of physical activity (the activity scale), and overall impact of one's respiratory condition on daily life and well-being (the impact scale). Each subscale is scored from zero to 100, with zero representing the best HRQoL. A difference of four points on any subscale is considered clinically significant.

### Lung function parameters

We conducted spirometry according to the American Thoracic Society guidelines<sup>10</sup> to measure: peak expiratory flow (PEF), FEV<sub>1</sub>, and the forced vital capacity (FVC).

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Participants were requested to withhold breathing medications for at least 12 hours before lung function tests were carried out, and spirometry was repeated again 20 minutes after the inhalation of 400 µg of salbutamol using a metered dose inhaler (MDI) with a spacer device. The spacer was attached to the MDI and held in the mouth after the patient had exhaled to functional residual capacity (FRC), the canister was then activated. The patient then inhaled slowly, to total lung capacity, held his/her breathe for 10 seconds then gradually exhaled.

## Dyspnoea

These were evaluated using the 6-minute walk test (6-MWT) according to the guidelines of American Thoracic Society.<sup>3</sup> It is a simple, easy to perform and well-tolerated functional walking test reflective of activities of daily living (ADL). The test was performed on a long, flat, straight, and enclosed corridor.

The subjects were instructed to wear comfortable clothing on the day of the test with fitting shoes and their walking aids (if they have any). They were advised to avoid vigorous exercise at least 2 hours before the test. No encouragement was given during the exercise so as not to interfere with self-pacing. The length walked was measured and the level of perceived breathlessness was measured both pre- and post-walk using an adapted Borg Scale and the visual analogue scale (VAS).

## Data analysis

The SGRQ variables were summarised using the Excel-based scoring calculator which was obtained by permission from the developer Prof Jones. The correlation between the scores, the dyspnoea ratings, 6-minute walking distances, and spirometric parameters were assessed using Pearson's linear correlation coefficient. Unless otherwise stated, the term 'significant' refers to a two-sided p-value <0.05.

## Results

Table 1 shows the degree of asthma severity in the subjects. The mean age of the males was 37±20.5 and for females 37±16 years. The mean duration of symptoms was also shown as 14±14.2 and 9±8 years for males and females respectively.

The number of night-time awakenings in the last week prior to the evaluation is shown. Four (24%) of the males have to wake up more than three times in the previous week as a result of asthma symptoms, as did three (9%) of the females.

Table 2 shows the summary of the SGRQ scores. The mean SGRQ scores were 44±23, 37±23, 26±15, 33±16 in the Symptom, Activity, Impact and Total domains respectively. The SGRQ scores were higher in all the domains for the females although the differences were not statistically significant. In both sexes, the symptom scores were found to be higher than the other domains.

Table 3 shows the correlation between the SGRQ scores, the lung functions, the 6-minute walk distance, and the dyspnoea assessment. No significant relationship was found between the SGRQ variables and the lung function parameters.

## Discussion

Several studies have looked at the quality of life among asthmatics using various instruments.<sup>11,12</sup> Our study showed the quality of life of the asthmatics assessed by the SGRQ which has been used to reliably measure treatment outcomes in patients.<sup>13</sup> It was chosen because it is a disease-specific measure and has the advantage of being superior in responsiveness and discriminating ability.<sup>9</sup> The SGRQ has been used among COPD patients in Nigeria,<sup>7,8</sup> but there is no indexed work to indicate its use among asthmatics in Nigeria.

Overall, the worst score was in the symptom domain with a mean score of 42.2±23.1. The best score was in the

	Male (mean ±SD)	Female Mean ±SD
<b>Age (years)</b>	37±20.5	37±16.1
<b>Mean duration of symptoms (years)</b>	14±14.2	9±8.2
<b>Wheeze</b>	14 (76%)	26 (84%)
<b>Night-time awakenings in the last week</b>		
Once	10 (59%)	22 (69%)
1 to 3	3 (18%)	7 (22%)
>3	4 (24%)	3 (9%)

Table 1 Asthma severity among the subjects

	Male	Female	Difference	C.I.	p value
<b>Total</b>		18	32		
<b>Symptom</b>	44±23	39±18	47±25	7.9	(-21.6, 5.7) 0.25
<b>Activity</b>	37±23	35±26	38±21	3.4	(-17.4, 10.6) 0.63
<b>Impact</b>	26±15	24±13	28±16	4.0	(-13.4, 5.3) 0.39
<b>Total</b>	33±16	30±16	34±16	4.5	(-14.2, 5.2) 0.36

Table 2 St George's Respiratory Questionnaire HRQoL scores

SGRQ scores	FEV1 (pre)	FVC (pre)	FEV1/FV	PEF	6MW	VAS	BORG
<b>Symptoms</b>	0.04	0.06	-0.04	0.01	0.00	-0.12	-0.09
<b>Activity</b>	0.13	0.15	0.09	-0.02	0.04	-0.05	-0.04
<b>Impact</b>	-0.02	-0.07	0.09	0.16	0.06	-0.06	-0.04
<b>Total</b>	0.06	0.05	0.08	0.08	0.05	-0.08	-0.07

Table 3 Correlation of HRQoL scores with spirometric and clinical parameters

impact domain with a mean score of  $26.9 \pm 15.7$ . The quality of life scores appear generally on the high side in the symptom and activity domains, indicative of worse health status in those subscales. Higher scores are indicative of worsening health status while zero represents the best state. In the study population, 60% of the respondents were females, however since it is not a random sample we can only conclude that in our tertiary referral population, asthma seems to be more common among women.

Other studies have found similar gender differences in the health-related quality of life of asthmatics. Belloch et al<sup>14</sup> found that women showed a poorer HRQoL than men, as well as higher degrees of anxiety and depression. Osborne et al<sup>15</sup> reported poorer quality of life in female asthmatics as assessed by some of the dimensions of the SF-36 scale. In another study by Temprano and Manino,<sup>16</sup> women demonstrated worse asthma control compared with men with regard to several short-term and long-term measures, despite reporting higher rates of inhaled corticosteroid use and routine asthma care visits. It remains to be elucidated whether these findings are due to differences in health reporting or to pathophysiologic differences in asthma between the sexes.

In a review which sought to look at the impact of asthma on HRQoL, it was found that asthma can adversely affect the physical, psychological, and social domains. It highlighted that females, those from lower socioeconomic groups, and ethnic minorities experience poorer quality of life as a result of their asthma symptoms.<sup>17</sup>

Our study also evaluated the relationship between the quality of life domains and the lung function parameters and the 6-minute walk test. There was no significant correlation between the quality of life scores and the lung function variables. This was similar to the findings of Levy et al<sup>18</sup> who found that one-time lung function measures were poorly correlated with respiratory symptoms or quality of life, which were significantly correlated. Krouse et al<sup>19</sup> found no association between peak expiratory flow variability and quality of life.

With the advent of valid reliable and responsive questionnaires designed to measure HRQoL, it has been shown that traditional clinical parameters, such as lung function tests that focus on air flow obstruction, have variable strengths of association with HRQoL even though the primary pathology of the disease condition is air flow obstruction. Thus, it has been recommended that HRQoL should be measured as an independent outcome in asthma-related studies.<sup>4</sup>

## Conclusions

This study showed that asthma results in significant impairment of HRQoL which correlates poorly with the spirometric measurement. Although this is not a novel finding, it has been demonstrated in our study population.

Gender appears to affect the HRQoL of the asthmatic, with the female sex appearing to predict a poorer quality of life.

The HRQoL assessment is an important aspect of evaluating the impact of asthma on the patients. Its use should be encouraged and locally validated and adapted instruments developed to augment the already existing ones. Routine use of mini HRQoL instruments should be incorporated into the clinic assessment of patients with asthma and other chronic respiratory diseases.

Greater attention should be paid to good asthma control, since increased frequency of attacks may indicate a worsening HRQoL.

## Limitations

The small sample size could have limited the ability to generalise our findings. The study was carried out at a tertiary referral centre where the category of patients were likely to have been those who are poorly controlled with difficult-to-treat asthma and thus the HRQoL may have been overestimated.

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