

Impact of Allergic Rhinoconjunctivitis on Quality of Life: A Prospective Observational Study

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Abstract:

Background: Allergic rhinoconjunctivitis (ARC) is a common IgE-mediated inflammatory disorder that adversely affects patients' quality of life (QoL). Evidence from the Indian population remains limited.

Objective: To evaluate the impact of allergic rhinoconjunctivitis on quality of life and its association with disease severity among patients attending a private ENT clinic in Bangalore.

Methods: A prospective observational study was conducted among 115 adults with clinically diagnosed ARC. Disease severity was assessed using the Allergic Rhinitis and its Impact on Asthma (ARIA) classification and Visual Analogue Scale (VAS), while quality of life was evaluated using the Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ). Associations between disease severity and QoL were analysed using correlation, ANOVA, and multiple linear regression.

Results: The mean age was 31.8 ± 11.2 years, and 58.3% were male. Moderate-to-severe persistent disease was the most common ARIA category (40.0%). The mean VAS and RQLQ scores were 6.9 ± 1.8 and 3.18 ± 1.05 , respectively. Nasal symptoms and sleep were the most affected QoL domains. VAS scores showed a strong positive correlation with RQLQ scores ($r = 0.76, p < 0.001$). Higher VAS scores, persistent disease, and coexisting bronchial asthma independently predicted poorer QoL.

Conclusion: Allergic rhinoconjunctivitis significantly impairs quality of life, particularly in patients with persistent and severe disease. Routine assessment using ARIA classification, VAS, and RQLQ may facilitate comprehensive evaluation and individualized management.

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Introduction

Allergic rhinoconjunctivitis (ARC) is an IgE-mediated inflammatory disorder characterized by the coexistence of allergic rhinitis and allergic conjunctivitis. It presents with nasal symptoms such as sneezing, rhinorrhea, nasal obstruction, and itching, along with ocular symptoms including itching, redness, tearing, and eyelid swelling. The condition is triggered by exposure to environmental allergens such as pollens, house dust mites, molds, and animal dander in genetically susceptible individuals.[1]

ARC is one of the most common allergic diseases worldwide, affecting approximately 10–30% of adults and up to 40% of children, with a steadily increasing prevalence over recent decades.[2] Beyond the physical symptoms, ARC significantly affects patients' daily functioning, educational

performance, work productivity, sleep quality, emotional well-being, and social interactions. These effects often remain underestimated despite the disease not being life-threatening.[3] The Allergic Rhinitis and its Impact on Asthma (ARIA) initiative recognizes allergic rhinitis and allergic conjunctivitis as components of a unified airway disease and recommends comprehensive assessment of symptom severity and quality of life in addition to clinical evaluation.[4] Persistent nasal obstruction and ocular irritation contribute to disturbed sleep, daytime fatigue, impaired concentration, reduced cognitive performance, and absenteeism from work or school. Consequently, the socioeconomic burden of ARC extends beyond healthcare expenditure to include loss of productivity and reduced quality of life.[5]

Several validated instruments, including the Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) and the Visual Analogue Scale (VAS), have been developed to quantify disease burden and treatment outcomes. These patient-reported outcome measures provide valuable insights into the functional impairment experienced by patients and facilitate individualized management.[8] Although international studies have documented the impact of ARC on quality of life, data from the Indian population remain relatively limited because of regional variations in allergen exposure, climate, and healthcare-seeking behavior.[7] Understanding the quality-of-life impairment among Indian patients with ARC may help clinicians optimize treatment strategies, improve patient counseling, and formulate effective public health interventions. Therefore, the present study aims to evaluate the impact of allergic rhinoconjunctivitis on quality of life among patients attending a private clinic.

Aim: To assess the impact of allergic rhinoconjunctivitis on the quality of life among patients attending a private clinic in Bangalore.

Objectives

Primary Objective

- To evaluate the quality of life in patients with allergic rhinoconjunctivitis using the Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ).

Secondary Objectives

- To determine the clinical profile of patients with allergic rhinoconjunctivitis.
- To assess the severity of symptoms using the Visual Analogue Scale (VAS) and ARIA classification.
- To evaluate the association between disease severity and quality-of-life scores.
- To determine the influence of demographic and clinical factors (age, sex, duration of disease, family history, comorbid asthma) on quality of life.

Materials and Methods

Study Design: Prospective observational study.

Study Duration: 12 months.

Study Population: Patients clinically diagnosed with allergic rhinoconjunctivitis attending the ENT Clinic

Inclusion Criteria

- Patients aged ≥ 18 years.
- Clinical diagnosis of allergic rhinoconjunctivitis according to ARIA guidelines.
- Willing to provide written informed consent.

Exclusion Criteria

- Infective rhinitis or conjunctivitis.
- Chronic rhinosinusitis with nasal polyposis.
- Structural nasal abnormalities requiring surgery.
- Autoimmune ocular diseases.
- Previous nasal or ocular surgery within the past 6 months.
- Patients unwilling to participate.

Data Collection

The following data were recorded:

- Demographic profile
- Duration of symptoms
- Family history of atopy
- ARIA classification
- Visual Analogue Scale (VAS) score
- Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) score
- Presence of asthma or atopic dermatitis

Outcome Measure

Primary outcome:

- Mean total RQLQ score.

Secondary outcomes:

- Correlation between VAS and RQLQ scores.
- Association between ARIA severity and quality of life.
- Predictors of impaired quality of life.

Statistical Analysis

- Data entered in Microsoft Excel and analyzed using SPSS version 26.
- Continuous variables: Mean $\pm$ SD.
- Categorical variables: Frequency and percentage.
- Student's t-test/ANOVA for comparison of mean scores.
- Chi-square test for categorical variables.
- Pearson or Spearman correlation between VAS and RQLQ scores. Normality assessed using Shapiro-Wilk test.
- Multiple linear regression to identify predictors of quality of life.
- $p < 0.05$ considered statistically significant.

Sample Size Calculation

For a descriptive observational study,

$$n = \frac{Z^2 \sigma^2}{d^2} \quad n = \frac{1.96^2 \times 1.3^2}{0.25^2} = 222$$

Where

- $Z = 1.96$ (95% confidence interval)
- σ = Standard deviation of RQLQ score = 1.3 (based on previous studies)
- d = allowable error = 0.25

$$n = \frac{(1.96)^2 (1.3)^2 (0.25)^2}{(0.25)^2} = \frac{(1.96)^2 (1.3)^2}{(0.25)^2} = 3.84 \times 1.69 \times 0.0625 = 0.0625 \times 3.84 \times 1.69 = 6.4900625$$

$$n = \frac{6.49}{0.0625} = 103.8 \approx 104$$

Minimum sample size = 104 patients

Considering a 10% non-response rate:

$$104 + 10.4 = 114.4$$

Final sample size = 115 participants

Results

Demographic Characteristics: A total of 115 patients with allergic rhinoconjunctivitis were enrolled. The mean age was 31.8 ± 11.2 years (range: 18–62 years). The majority belonged to the 21–40 years age group (61.7%). There were 67 males (58.3%) and 48 females (41.7%), with a male-to-female ratio of 1.4:1.

Table 1: Age distribution

Age group (years)	Number	Percentage
18–20	12	10.4
21–30	39	33.9
31–40	32	27.8
41–50	20	17.4
>50	12	10.4

Clinical Characteristics: Sneezing was the commonest nasal symptom (95.7%), followed by rhinorrhea (90.4%), nasal obstruction (82.6%), and nasal itching (78.3%). Ocular itching was observed in 93.9%, watering in 87.8%, redness in 69.6%, and eyelid swelling in 18.3%.

A positive family history of atopy was present in 44.3%, while bronchial asthma was noted in 22.6% of patients.

ARIA Classification

Table 2:

Classification	Number	Percentage
Mild intermittent	20	17.4
Mild persistent	24	20.9
Moderate–severe intermittent	25	21.7
Moderate–severe persistent	46	40.0

Moderate-to-severe persistent allergic rhinoconjunctivitis was the most common ARIA category, accounting for 40.0% of patients.

Visual Analogue Scale (VAS)

Mean VAS score:

$$6.9 \pm 1.8$$

Distribution:

- Mild (0–3): 15 (13.0%)

- Moderate (4–6): 38 (33.0%)
- Severe (7–10): 62 (53.9%)

Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ)

The overall mean RQLQ score was

$$3.18 \pm 1.05$$

Mean domain scores were:

Table 3:

Domain	Mean $\pm$ SD
Activities	3.02 ± 1.14
Sleep	3.54 ± 1.18
Practical problems	2.87 ± 0.98
Nasal symptoms	3.81 ± 1.09
Eye symptoms	3.42 ± 1.16
Emotional function	2.74 ± 1.01
Non-nasal symptoms	2.89 ± 1.08

The nasal symptom domain demonstrated the highest impairment.

Correlation Between Disease Severity and Quality of Life: A strong positive correlation was observed between VAS score and RQLQ score.

Pearson correlation coefficient (r) = 0.76

$p < 0.001$

Mean RQLQ scores increased significantly with increasing ARIA severity, with the highest scores

observed among patients with moderate-to-severe persistent disease (ANOVA, $p < 0.001$).

Table 4:

ARIA Category	Mean RQLQ
Mild intermittent	1.72 ± 0.48
Mild persistent	2.51 ± 0.64
Moderate-severe intermittent	3.36 ± 0.72
Moderate-severe persistent	4.08 ± 0.81

ANOVA:

$F = 39.8$

$p < 0.001$

Predictors of Poor Quality of Life

Multiple linear regression analysis demonstrated that

- VAS score ($\beta = 0.59$, $p < 0.001$)
- Persistent disease ($\beta = 0.31$, $p = 0.004$)
- Bronchial asthma ($\beta = 0.22$, $p = 0.03$)

were independent predictors of impaired quality of life.

Age and gender were not significantly associated with RQLQ score.

Discussion

The present study evaluated the clinical profile, disease severity, and quality of life among patients with allergic rhinoconjunctivitis using the ARIA classification, Visual Analogue Scale (VAS), and Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ). The majority of patients belonged to the 21–40-year age group with a slight male predominance, findings that are consistent with Indian studies reporting allergic rhinitis to be more prevalent among young adults because of greater occupational and environmental allergen exposure.[8,9] Sneezing, rhinorrhea, and ocular itching were the predominant symptoms, reflecting the classical clinical presentation described in Indian hospital-based studies.[8–10]

Moderate-to-severe persistent disease was the most common ARIA category (40%), indicating that many patients seek medical care only after symptoms become persistent and significantly affect daily life. Similar findings have been reported in Indian studies evaluating ARIA classification and quality of life.[7,11] The mean VAS score of 6.9 ± 1.8 and the predominance of severe VAS scores indicate poor symptom control at presentation. The overall mean RQLQ score of 3.18 ± 1.05 demonstrates a moderate impairment in quality of life, with the nasal symptom and sleep domains being the most affected. These observations are comparable with Indian studies that have shown

persistent allergic rhinitis adversely affects sleep, work productivity, and daily activities.[10–13]

A strong positive correlation between VAS and RQLQ scores ($r = 0.76$, $p < 0.001$) confirms that increasing symptom severity is associated with greater quality-of-life impairment. Furthermore, higher VAS scores, persistent disease, and coexisting bronchial asthma independently predicted poorer quality of life, whereas age and gender showed no significant association. These findings support the current ARIA recommendations advocating routine assessment using patient-reported outcome measures such as VAS and RQLQ to guide individualized treatment and monitor disease control.[12]

Conclusion

Allergic rhinoconjunctivitis has a significant adverse impact on quality of life, particularly in patients with moderate-to-severe persistent disease. Symptom severity assessed by VAS strongly correlates with impairment in RQLQ scores, while persistent disease and bronchial asthma independently predict poorer quality of life. Routine use of ARIA classification, VAS, and RQLQ in clinical practice can facilitate comprehensive assessment, identify patients requiring intensified treatment, and improve patient-centered outcomes through timely and individualized management.

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