

## The impact of asthma and aspirin sensitivity on quality of life of patients with nasal polyposis

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### Abstract

**Background:** Nasal polyposis is not a life-threatening disease but may have a great impact on patient's quality of life. **Objective:** To investigate the impact of nasal polyps on quality of life compared with the Spanish general population using the SF-36 questionnaire; and to evaluate the impact of asthma and aspirin sensitivity on quality of life in patients with nasal polyposis. **Methods:** We included 130 patients with nasal polyposis and evaluated nasal symptom, CT scan, polyp size, and quality of life. **Results:** In comparison with the Spanish general population, patients with nasal polyposis had worse scores on all SF-36 domains except for physical functioning. Asthmatic patients with nasal polyposis had worse quality of life than nonasthmatic patients on role physical, body pain, and vitality ( $p < 0.05$ ). The authors found no significant differences on quality of life, nasal symptoms, polyp size, and CT scan scores between patients with aspirin-tolerant and aspirin-sensitive asthma. **Conclusion:** These results suggest that nasal polyposis has a considerable impact on quality of life. Moreover, asthma but not aspirin sensitivity has an additional negative impact on the quality of life of patients with nasal polyposis.

**Key words:** Aspirin sensitivity, Asthma, nasal polyposis, Quality of life, SF-36 questionnaire

### Introduction

Nasal polyposis (NP) is a chronic inflammatory disease of the nose and sinus mucosa that, despite differing hypotheses of its cause, remains poorly understood [1]. NP is frequently associated with asthma and other pulmonary disorders such as cystic fibrosis, primary ciliary dyskinesia, and aspirin sensitivity [2, 3]. Most authors agree on the fact that management of NP should be primarily based on a medical approach to be completed by surgical procedures only in the case of drug failure [4, 5].

Although NP is not a life-threatening disease it can significantly decrease patient's quality of life (QoL). However, the impact of NP to patients' general health status has not been reported for the

Spanish patients. Generally, there are two major types of QoL instruments used in clinical trials: specific and generic. Specific questionnaires are usually focused on one particular area such as a disease state, a selected population, or a certain function or problem. Several specific instruments for patients with chronic sinusitis such as the Rhinosinusitis Disability Index, the Chronic Sinusitis Survey Score, and the SinoNasal Outcome Test-16 have been developed [6].

Generic QoL questionnaires are also available to assess the burden of illness in different conditions. The medical Outcome Study Short Form-36 (SF-36) is the most widely used generic instrument. It has recently been adapted for the Spanish-speaking general population showing a good reproducibility and validity [7–9].

The aims of this study were: (1) to investigate the impact of nasal polyps on QoL compared with the Spanish general population using the SF-36 questionnaire; and (2) to evaluate the effect of asthma and aspirin sensitivity on QoL in patients with NP.

### Material and methods

One hundred and thirty patients with NP were included in this prospective study from February 1999 to February 2004. The mean age was  $50 \pm 1.3$  years (ranging from 22 to 84 years) and 33% were female (Table 1). All patients had severe nasal polyposis and were examined by the same otorhinolaryngologist at the Department of Otolaryngology, Hospital Clinic of Barcelona.

The diagnosis of nasal polyposis was based on: (1) visualization of bilateral polyps under endoscopic examination, and (2) bilateral opacification of paranasal sinuses and nasal cavities by computed tomography (CT) scan [10]. The authors obtained approval for the study from the local Ethic's Committee of our institution and all patients signed informed consent. One hundred thirty patients with NP completed the SF-36 survey after a 4-week washout period of oral and intranasal steroids. We also scored nasal symptoms, polyp size, and CT scan.

The SF-36 questionnaire consists of 36 self-administered questions developed to measure eight health domains. Domain scores range from 0 to 100, higher scores indicating better QoL. Two summary scales are also included: the physical component summary (PCS) and the mental component summary (MCS) [7–9].

Nasal obstruction, loss of sense of smell, rhinorrhea, and sneezing were scored. The authors

scored the severity of these symptoms as follows: 0, no symptom; 1, mild symptom; 2, moderate symptom; and 3, severe symptom. We scored the polyp size using endoscopy from 0 to 3 for each nasal cavity: 0, no polyps; 1, mild polyposis; 2, moderate polyposis; 3, severe polyposis [11].

All patients included in this study had CT scan of paranasal sinuses. CT scan opacification for each patient was blindly staged by the same radiologist using the Lund–Mackay score system [12]. This system scores: 0, no opacity; 1, partial opacity; and 2, total opacity for each of the sinuses. In addition, the ostiomeatal complex scores 0 for no obstruction or 2 when obstructed. The system has a total score of 12 for each side.

### Statistical analysis

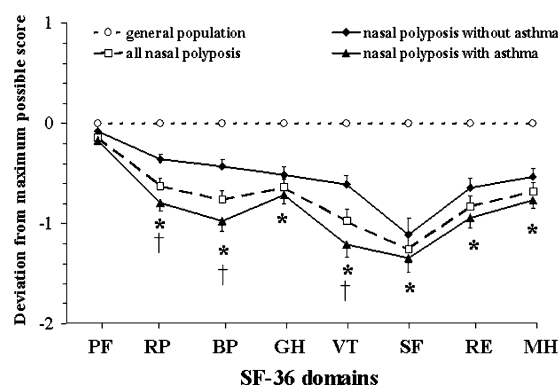
We used unpaired Student's *t*-test to compare the SF-36 scores of nasal polyp patients with those of the Spanish general population, between asthmatic and nonasthmatic patients, and between aspirin-tolerant and aspirin-sensitive asthmatic patients. SF-36 scores for healthy control subjects from the Spanish population used in comparative analyses were derived from a sample of 9984 people of whom 51.8% were females [7]. Statistical analysis was performed using SPSS for Windows (SPSS 10.0, Chicago, IL, USA). A *p*-value of  $<0.05$  was considered to be significant. The data are presented as mean  $\pm$  SEM (standard error of the mean). We used Pearson correlation coefficients to examine the association between QoL scores and sex, age, nasal symptoms, and CT scores. We calculated the internal consistency by Cronbach's  $\alpha$  coefficient for each SF-36 scale [13].

### Results

In comparison to the Spanish general population [7], patients with NP had significantly worse QoL scores in all SF-36 domains, except for physical functioning (Figure 1). The MCS was significantly lower than the PCS (Table 2). The Spanish general population has similar values for both MCS (79.7) and PCS (78.8), suggesting that NP impaired mental health more than physical health. Analysis of internal consistencies for all SF-36 domains showed a Cronbach's  $\alpha$  value higher than 0.7

**Table 1.** Characteristics of patients with nasal polyposis

	N	Age (year)	Sex (female)
All patients with nasal polyposis	130	$50 \pm 1.3$	33%
Nasal polyposis without asthma	51	$52 \pm 2.0$	37%
Nasal polyposis with asthma	79	$49 \pm 1.7$	30%
Aspirin-tolerant	42	$50 \pm 2.7$	26%
Aspirin-sensitive	37	$49 \pm 1.9$	35%



**Figure 1.** Quality of life in patients with nasal polyposis. Physical functioning (PF), role physical functioning (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional functioning (RE), and mental health (MH). \* $p < 0.05$ , nasal polyp patients compared to the Spanish general population; \*\* $p < 0.05$  comparison between asthmatic and nonasthmatic patients with nasal polyposis.

(from 0.72 to 0.91) except for physical functioning (0.61). Patients scored loss of sense of smell and nasal obstruction as the major complaints, while rhinorrhea and sneezing were much less frequent and discomforting. All patients showed severe nasal polyps and high CT scan scores (Table 3). Age, sex, nasal symptoms, polyp size, and CT scan scores were not statistically correlated to SF-36 scores.

Asthmatic patients with NP had lower scores of QoL ( $p < 0.05$ ) than nonasthmatic patients with NP on role physical, body pain, and vitality (Figure 1). Asthmatic patients also showed lower PCS and MCS than nonasthmatic patients (Table 2). Asthmatic patients had higher scores of nasal obstruction and loss of sense of smell than nonasthmatic patients ( $p < 0.05$ ). Compared with

nonasthmatics, patients with nasal polyposis and asthma had a similar polyp size but more extensive sinus disease CT score ( $p < 0.05$ ).

The authors found no significant differences on QoL, nasal symptoms, polyp size, and CT scan scores between patients with aspirin-tolerant and aspirin-sensitive asthma.

## Discussion

The main findings of our study showed that: (1) nasal polyps patients have an impaired QoL when compared to the Spanish general population; (2) asthma has an accumulative negative impact on QoL in patients with nasal polyposis; and (3) aspirin sensitivity has no additional impact on QoL.

Radenne et al. [14] has reported the unique study investigating the impact of nasal polyposis in QoL demonstrating that nasal polyps impaired QoL in all SF-36 domains. Gliklich and Metson [15] assessed the burden of chronic sinusitis by using the SF-36 questionnaire and demonstrated a significant decrease in body pain, general health, vitality, and social functioning domains compared with the American general population. Using the SF-36, other studies have also demonstrated that chronic rhinosinusitis has a considerable impact on all SF-36 domains except for physical functioning and compared with a healthy population [16–18].

Patients with NP had lower scores in all SF-36 domains except for physical functioning and general health than patients with coronary artery disease [19], chronic obstructive pulmonary disease [8], and asthma [20]. Radenne et al. [14] showed

**Table 2.** Physical and mental component summaries of asthmatic (aspirin-tolerant and aspirin-sensitive) and nonasthmatic patients with nasal polyposis

	Physical component summary	Mental component summary
All patients with nasal polyposis	46.5 ± 1.9*	39.7 ± 1.8*
Nasal polyposis without asthma	48.2 ± 2.1*	41.5 ± 2.1*
Nasal polyposis with asthma	45.5 ± 1.8***	38.2 ± 2.4***
Nasal polyposis with aspirin-tolerant asthma	45.6 ± 2.3***	38.0 ± 1.9***
Nasal polyposis with aspirin-sensitive asthma	45.1 ± 3.1***	38.5 ± 3.0***

\* $p < 0.05$  nasal polyposis compared to general population; \*\* $p < 0.05$ , asthmatic (aspirin-tolerant and aspirin-sensitive) compared to nonasthmatic patients.

**Table 3.** Nasal symptoms, polyp size, and CT scan scores for all patients with nasal polyposis

	Nasal obstruction	Loss of sense of smell	Rhinorrhea	Sneezing	Polyp size	CT scan
Nasal polyposis	2.3 ± 0.1	2.2 ± 0.1	1.8 ± 0.1	1.4 ± 0.1	2.7 ± 0.1	19.1 ± 0.4
Nasal polyposis without asthma	1.9 ± 0.1	1.9 ± 0.1	1.6 ± 0.1	1.2 ± 0.1	2.6 ± 0.1	17.8 ± 0.7
Nasal polyposis with asthma	2.5 ± 0.1*	2.4 ± 0.1*	1.9 ± 0.1	1.5 ± 0.1	2.8 ± 0.1	20.2 ± 0.4*

Nasal symptoms and polyp size were scored from 0 to 3 and CT scan from 0 to 24. \*  $p < 0.05$ , asthmatic compared to nonasthmatic patients with nasal polyposis.

that NP impaired the QoL more seriously than perennial allergic rhinitis and asthma especially for vitality, body pain, and general health. Gliklich and Metson [21] reported that patients with chronic sinusitis have more body pain and affected social functioning than patients with congestive heart failure, angina, chronic obstructive pulmonary disease, and back pain.

This study provides additional evidence that the degree of abnormality on sinus disease CT scan is not associated with impairment of QoL. However, Winstead and Barnett [16] demonstrated a trend of lower SF-36 scores for patients with NP associated with extensive sinus disease demonstrated by CT scan. Krouse et al. [22] also failed to demonstrate any association between CT stage and patient QoL using the Rhinosinusitis Disability Index.

Radenne et al. [14] also reported greater impairment of QoL when NP was associated with asthma. These authors showed that physical functioning, role physical, role emotional, vitality, and body pain scores were significantly lower in asthmatic than in nonasthmatic patients. However, Gliklich and Metson [21] showed that the presence of asthma was not predictive of a poor outcome in patients with chronic sinusitis. Winstead and Barnett [16] demonstrated that asthma had an adverse impact on vitality and general health compared with rhinosinusitis alone from patients with rhinosinusitis alone.

The impact of aspirin sensitivity has never been studied before. In our study, we demonstrated that aspirin sensitivity had no further negative impact on QoL.

However the evaluation of NP is presently impeded by a lack of valid specific instruments to measure QoL. Gliklich and Hilinski [23] used specific and generic questionnaires in chronic sinusitis and concluded that disease-specific seems to be more sensitive than a generic instrument in following patients after endoscopic sinus surgery.

In conclusion, these results suggest that NP has a considerable impact on QoL, and that asthma but not aspirin sensitivity has an additional negative impact on QoL of patients with NP.

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