Eur Arch Otorhinolaryngol (2010) 267:473–475
DOI 10.1007/s00405-009-1180-8

LETTER TO THE EDITOR

Quality of life in patients with chronic rhinosinusitis: a validation of the Czech version of SNOT-22 questionnaire

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Received: 22 November 2009 / Accepted: 15 December 2009 / Published online: 24 December 2009

Dear Sir,

Quality of life (QoL) is defined as the difference between expectations and experience [1]. A part of the overall QoL is health-related quality of life (HRQoL), which is influenced by the health of patients and can be changed through treatment. Since the 1990s, there have been increased efforts to evaluate QoL of patients in all medical fields. Tools used to evaluate QoL are either generic health instruments for assessing general conditions or disease-specific questionnaires focused on symptoms of a disease. Chronic rhinosinusitis (CRS) is a disease characterized by a high prevalence and significant reduction in QoL. Although today there are many diagnostic methods for evaluating sinonasal disease, it cannot be said that the results clearly correlate with QoL, as it is perceived by patients [2].

Until now, there has been no validated Czech version of the questionnaire for evaluating QoL in patients with CRS. We used sinonasal outcome test (SNOT-22) questionnaire [3], which is based on the SNOT-20 questionnaire [4]. The difference between the two assessment tools is the addition of two questions relating to the evaluation of (i) nasal obstruction and (ii) smell and taste, which can be regarded as important indicators of QoL. SNOT-22 is recommended as one of the best tools for assessing QoL in patients with CRS [5].

A group of 52 patients (31 men, 21 women; mean age 50.5 years) with CRS, either with or without nasal polyps (NP) who were scheduled to undergo endoscopic sinus surgery (ESS) were enrolled in the study. All the patients filled a SNOT-22 questionnaire (Czech version) preoperatively (T0), 3 months (T1), and 6 months (T2) after surgery.

There were two control groups: group 1 consisted of 50 patients admitted to the ENT clinic with non-sinonasal disease (24 men, 26 women; mean age 44.9 years); group 2 consisted of 50 healthy students of the Faculty of Medicine (22 men, 28 women; mean age 24.1 years). Both control groups also completed the SNOT-22 questionnaire.

The study was approved by local Ethics Committee and each patient signed an informed consent. Properties of the questionnaire were tested by determining reliability, validity, and sensitivity. Reliability (internal consistency) was tested using Cronbach's α and test–retest reliability determination. For the latter (determination of the stability of the questionnaire over time), 10 patients completed the questionnaire for a second time—3 weeks after completing the questionnaire in time T1.

Discriminate validity (the ability of the questionnaire to distinguish between those who suffer from disease and other populations) was tested by comparing the patients with the two control groups. The groups were then compared with analysis of variance (ANOVA) and Tukey–Kramer HSD test. Sensitivity (responsiveness) was assessed using the standardized mean response (SRM) coefficient.

Results of Cronbach's α were 0.852, 0.904, and 0.877 in T0, T1, and T2, respectively. Values approaching 1.0 indicate excellent internal consistency. Also, the value of test–retest reliability, expressed as Pearson's coefficient, of 0.86 indicates a high correlation between the two questionnaires completed by the same patient 3 weeks apart.

ANOVA and the Tukey–Kramer HSD test showed significant differences between patients with CRS and the two control groups (Table 1).

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Table 1 Comparison study of patients with two control groups for all questions (1–22)

ANOVA				
Question no.	*p*	Tukey–Kramer HSD test		
		Patients versus controls 1	Patients versus controls 2	Controls 1 versus controls 2
1	<0.0001	+	+	–
2	<0.0001	+	+	–
3	<0.0001	+	+	–
4	<0.0001	+	+	–
5	<0.0001	+	+	–
6	<0.0001	+	+	–
7	<0.0001	+	+	–
8	<0.0001	+	+	–
9	0.0022	+	+	–
10	0.0141	–	+	+
11	0.1707	–	–	–
12	<0.0001	+	+	–
13	0.0001	+	+	–
14	<0.0001	+	+	+
15	<0.0001	+	+	–
16	0.0007	+	+	–
17	0.0278	+	–	–
18	0.0313	+	–	–
19	0.2011	–	–	–
20	0.0641	–	–	–
21	0.4180	–	–	–
22	0.1579	–	–	–
TS	<0.0001	+	+	–

TS total score

+ significant difference;
– without significant difference

Means of the total score of the questionnaire for CRS patients, non-sinonasal patients, and healthy controls were 38.52, 13.68, and 10.22, respectively. In terms of sensitivity, expressed by the SRM coefficient, the questionnaire recorded a significant improvement in the postoperative QoL, which would be expected in a correctly compiled health-related QoL questionnaire. SRM coefficients for difference in total score between T0 and T1 and between T0 and T2 were 1.806 and 1.566, respectively. QoL is a standard part of the algorithms used to evaluate disease severity, treatment efficacy, or different treatment modalities. QoL assessment is a unique instrument, which is particularly important from the patient's point of view.

Of interest is the fact that QoL, as reported by patients, does not correlate with objective findings of other examinations. A weak, clinically insignificant association was demonstrated between SNOT-22 and the commonly used Lund–Mackay CT score [6].

Also no correlation was demonstrated between mucociliary clearance or eosinophilia and severity of symptoms of CRS [7, 8].

Hopkins et al. [3] in a level of evidence IIc study, investigated the effect of surgical treatment of CRS (with or without NP) on QoL using SNOT-22. In this study, 3128 patients with CRS were evaluated and the authors demonstrated significant improvement in the SNOT-22 score at 3, 12, and 36 months after surgery. Also, our patients showed statistically significant improvements in QoL at 3 and 6 months after surgery (expressed as a SRM coefficient) confirming a desirable level of sensitivity (responsiveness) for the Czech version of the questionnaire.

In our study, Cronbach's α for the total SNOT-22 score (TS) at T0 was 0.852. This result shows good internal consistency for the Czech version of the questionnaire, and approaches the results of the study by Hopkins et al. [9] (Cronbach's $\alpha = 0.91$). Also, the values of the test–retest coefficients are comparable (0.86 vs. 0.93) and confirm good reliability between repeated measurements.

The ability of the questionnaire to distinguish the disease-affected group was tested by comparison with healthy subjects and with a group of patients with non-sinonasal disease. Means of the total scores are comparable with the

English-validated version of SNOT-22 (38.5–40.8 in CRS patients and 10.2–9.3 in healthy controls) [9].

Besides the expected difference between patients with CRS and healthy individuals, we demonstrated the ability of the questionnaire to distinguish CRS patients from a group of patients with non-sinonasal disease. While it is clear that SNOT-22 is not intended to be a diagnostic instrument, this finding again demonstrates good internal consistency and balance between the disease specific and non-specific items in the questionnaire.

In conclusion, the study showed that the Czech version of SNOT-22 QoL questionnaire is a valid tool for assessing QoL of patients with CRS and the effectiveness of surgical treatment.

Conflict of interest statement None.

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