ORIGINAL CLINICAL RESEARCH

Psychometric evaluation of the SinoNasal Outcome Test-16 for quality of life in chronic rhinosinusitis with nasal polyps

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Summary

Objectives: In chronic rhinosinusitis (CRS), SinoNasal Outcome Test-16 (SNOT-16) is a specific quality of life (QoL) questionnaire, validated in English and existing in a French translation. The present study assessed the psychometric characteristics of the French translation in nasal polyposis (NP).

Methods: The QoL of 40 NP patients was assessed before and after endoscopic ethmoidectomy, with the generic Study Short Form 36 (SF-36) and the specific SNOT-16 questionnaires.

Results: SF-36 scores were improved 1 year postoperatively. The SNOT-16 Cronbach α coefficient was 0.81. In the preoperative course, SNOT-16 scores correlated with the mental composite score ([MCS]: $P = 0.034$; rho $= -0.36$) and the role-physical ([RP]: $P = 0.02$; rho $= -0.39$), vitality ([VT]: $P = 0.008$; rho $= -0.44$) and role-emotional ([RE]: $P = 0.035$; rho $= -0.36$) dimensions of the SF-36. SNOT-16 scores were poorer in women ($P = 0.03$) and in case of aspirin intolerance ($P = 0.044$). SNOT-16 scores were significantly lower 1 year after surgery ($P = 0.0017$).

Conclusion: The SNOT-16 seemed, in the present series, to be a reliable, valid and sensitive questionnaire. Validation on a larger series could enable its use in the French NP population to assess the precise effectiveness of therapeutic strategies.
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Introduction

In nasal polyposis (NP), during the last decade, attention has focused on the assessment of symptoms and especially of quality of life (QoL) impact. The European Academy of Allergology and Clinical Immunology (EAACI) has validated a method of overall symptom intensity assessment on a visual analog scale (VAS), from 0 to 10 cm [1]. QoL questionnaires assess either general health (GH) status (generic questionnaires) or specific pathology-related health status (specific questionnaires). Generic questionnaires enable the QoL of a patient suffering from a given illness to be compared to that of patients with other pathologies or of pathology-free subjects in the general population. The Medical Outcomes Study Short Form 36 (SF-36) questionnaire is the most widely used, and has been validated pre- and postoperatively in

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chronic rhinosinusitis (CRS) (levels of proof IIa and IIb). Several specific questionnaires assessing QoL in CRS have been published and assessed in their English-language versions. The RhinoSinusitis Outcome Measure (RSOM) comprises 31 items and takes 20 minutes to complete. The SinoNasal Outcome Test-20 (SNOT-20), derived from the RSOM, has been validated and is used in medical and surgical studies (levels of proof Ib and IIb). The SNOT-16, also derived from the RSOM, has been translated and made usable in a Canadian French version; it is the only CRS-specific questionnaire available in French, based on North American studies, but has yet to be assessed and validated in France.

As measurement tools, QoL questionnaires are characterized by their psychometric features, i.e.:

- reliability (or precision), assessed by internal coherence, or the correlation between scores on different questionnaire items measuring the same attribute;
- validity (or relevance), assessed by comparison with another, already validated, QoL gold standard;
- sensitivity to change, or the method's ability to reflect perceptible variations, whether spontaneous (due to the natural evolution of the disease) or induced (by treatment).

The present study tested the SNOT-16 questionnaire, assessing QoL in patients followed for NP. Its psychometric properties were assessed against SF-36 data as gold standard.

Patients and methods

A prospective study, run from January 2007 to January 2009, included 40 patients followed for primitive NP resistant to well-conducted medical treatment (maximal dose topical corticotherapy and failure of at least three courses of general corticotherapy), in whom endoscopic endonasal ethmoidectomy was performed.

All patients provided written consent and were interviewed on the eve of surgery to assess preoperative QoL on the generic SF-36 and CRS-specific SNOT-16 questionnaires.

The SF-36 is a self-administered questionnaire comprising 36 questions grouped into eight dimensions or scales, each corresponding to a certain aspect of health status: physical functioning (PF), role-functioning (physical) (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-functioning (emotional) (RE) and mental health (MH). Responses to each of the 36 questions are weighted to define the scores on each of the eight dimensions. These eight scores are then linearized to provide a transformed score of between 0 and 100. A minimum score corresponds to limited health, and a maximum score (100) to absence of disease-related limitations. Factorial analysis of the eight SF-36 scales defines two composite scores: the mental composite score (MCS), combining dimensions VT/SF/RE/MH, and the physical composite score (PCS), combining dimensions PF/RP/BP/GH, both calculated by standardization of the transformed scores on the relevant dimensions by specific weighting coefficients, applicable to any population [2].

The SNOT-16 is a self-administered questionnaire comprising 16 questions. Its French version is available on the Washington University in Saint-Louis School of Medicine website: http://oto2.wustl.edu/clinepi. Responses are scored as: 0 = no bother, 1 = mild or minor bother, 2 = moderate bother, 3 = severe bother. Patients are also asked to check to five items which are most important to them personally. Scores range from 0 (no functional bother) to 48 (maximal functional bother) [3].

All 40 patients were followed up in the department at least 1 year postoperatively for QoL assessment. Meanwhile, they had been receiving local mometasone furoate (100 to 200 μg/d); no general corticotherapy was prescribed. Patients needed to be contacted once or several times for them to come to this assessment session. The generic SF-36 and the specific SNOT-16 questionnaires were used. Postoperative data harvesting lasted from January 2008 to January 2009.

Statistical analysis used MedCalc® software (Mariakerke, Belgium). Means for independent nonmatched groups were compared by nonparametric Kruskall Wallis and Mann Whitney tests, and for matched groups by nonparametric Wilcoxon test. Correlation analysis was by parametric Pearson test for continuous variables and by nonparametric Spearman test for discrete variables. The significance threshold was set at $P \leq 0.05$ for all tests. The rho correlation coefficient was used; internal QoL questionnaire coherence was assessed by the Cronbach alpha coefficient, with values greater than 0.8 indicating good internal coherence.

Results

Population

Forty patients were included: 23 male (58%) and 17 female (42%). Median age was 54 years (range: 16—72 yrs). NP was isolated in 22 cases (55%), associated with asthma in 11 (27.5%) and part of a Fernand-Widal triad in seven (17.5%). Seventeen patients (42.5%) were sensitized to one or more allergens. Seventeen (42.5%) had undergone previous endonasal polypectomy (6/17) or ethmoidectomy (11/17).

Pre- and postoperative generic Study Short Form 36 quality of life assessment

All 40 patients completed the preoperative SF-36 questionnaire.

Median physical (PCS) and MCS were respectively 45.6/100 (range: 23.4—62.2) and 39.9/100 (range: 10.6—58.6). The eight SF-36 dimension scores were all lower than those of the disease-free general population, and especially as regards the RP and SF dimensions (Fig. 1).

Twenty-eight postoperative SF-36 questionnaires could be analyzed. PCS, MCS and all eight dimensions tended to show improvement at 1 year postoperatively, and significantly so for MCS ($P = 0.01$), SF ($P = 0.0006$) and MH ($P = 0.05$) (Table 1). Subgroup analysis by gender, clinical form, history of polypectomy or ethmoidectomy did not alter these findings.