The MARS questionnaire: quality of life survey for acute rhinosinusitis

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Abstract. The MARS questionnaire: quality of life survey for acute rhinosinusitis. Purpose: Acute rhinosinusitis (ARS) significantly reduces the quality of life (QoL). While intensive research has focused on the QoL in patients with chronic rhinosinusitis, data regarding the impact of ARS on the QoL are relatively sparse. The aim of this study was to construct and validate a simple, reliable QoL questionnaire for ARS patients, which is also one of the priorities set for EPOS 2012.

Methods: The questionnaire was constructed as follows: a review of literature, collection of symptoms as well as social and emotional consequences by a panel of ENT specialists and general practitioners, interviews with patients experiencing ARS, and a pre-test with another patient group. The questionnaire was validated by determining its internal reliability, discriminant validity, and responsiveness. The survey was given to 50 ARS patients at the time of diagnosis and again 14 days after treatment. The ARS diagnosis was established using the EPOS 12 criteria. The control group consisted of 50 medical students without any sinonasal symptoms.

Results: We developed a 13-item questionnaire, called the MARS (Measurement of Acute Rhinosinusitis). Cronbach’s alpha was determined to be 0.679. The two-tailed t-test showed a statistically significant difference between the patient group and the control group (p=0.0000). The SRM coefficient was 1.781.

Conclusion: The MARS questionnaire is a QoL instrument developed and validated especially for patients with ARS. This survey demonstrated good internal consistency and excellent discriminant validity, responsiveness, and feasibility for use in daily clinical practice and research.
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than 0.05 was considered statistically significant. Responsiveness (sensitivity) was assessed using the Standardized Response Mean (SRM). Statistical analysis was performed by a certified statistician and calculations were completed using Statgraphic 5.1 software.

Patient and control groups

The MARS questionnaire was given to 50 ARS patients at the time of diagnosis and again 14 days after treatment. The ARS diagnosis was established using the EPOS 12 criteria\textsuperscript{6} and confirmed by rhinoendoscopy. Treatment followed EPOS guidelines (recommendation of intranasal steroids with antibiotics reserved for severe cases\textsuperscript{13}). Patients were recruited from three ENT offices and the outpatient department of the University Hospital. The patient group consisted of 29 women and 21 men with a mean age of 40.4 years (18-71 years). The control group consisted of 50 medical students (31 women, 19 men, mean age: 22.8 years) without any sinonasal symptoms. Atopic patients represented 22 % and 28 % of the study and control group, respectively.

Results

Cronbach’s alpha was calculated as 0.679. The two-tailed t-test showed a statistically significant difference between the patient group and the control group ($t=12.58$ and $p=0.0000$). Statistical data are summarized in Table 1. The SRM was calculated by dividing the mean change by the standard deviation of the change and was determined to be 1.781, which shows that the questionnaire has the capability to reflect changes in QoL after therapeutic intervention. The data used for the SRM-calculation are listed in Table 2.

Discussion

Based on current literature, the modified SNOT-16 is a recommended QoL instrument for patients with ARS.\textsuperscript{6,14} The questionnaire was validated for ARS by Garbutt in 2011.\textsuperscript{10} Another instrument, also validated for ARS patients, is the 17-item Rhinosinusitis QoL Survey (RhinoQoL), which measures symptom frequency, bothersomeness,
Quality of life in acute rhinosinusitis

We did not measure the test-retest reproducibility of the MARS questionnaire because we believe the QoL in patients can be affected by adequate treatment within a single day. Garbutt et al. performed a test-retest by phone the same day as the first completion; however, this approach could be problematic since patients may remember how they answered during the first examination, which is not the aim when reproducibility is being tested. The RhinoQoL test-retest was performed only for CRS patients. The feasibility of the questionnaire was assessed by pretesting with real patients in order to get feedback. After a short set of instructions, patients completed the questionnaire in less than three minutes. In addition to the MARS survey, we performed further tests (rhinoendoscopy, bacteriology, and CRP) and the second questionnaire was completed as a face-to-face interview and not by phone or e-mail. As expected, we observed some reluctance from patients to come for a second visit, which was in contrast with patients suffering from CRS. This phenomenon can be explained by the marked improvement of symptoms after adequate treatment of ARS. The relatively small number of patients enrolled in this pilot project can be regarded as a limitation of the study, but the group of the patients has now expanded and future research is focused on the correlation between QoL and the results of objective examinations.

Conclusion

The MARS questionnaire is a QoL instrument developed and validated especially for patients with ARS. This survey demonstrated good internal consistency and excellent discriminant validity, and the impact scale. We compared the modified SNOT-16 and MARS and found the SNOT-16 does not include certain symptoms, including nasal obstruction and smell disorders, which are included in the EPOS document as basic ARS diagnostic criteria. Another symptom included in MARS, but not the SNOT-16, is tenderness above the sinuses, which is commonly reported by ARS patients. On the other hand, the SNOT-16 survey also includes coughing and ear fullness, which are not included in MARS. With regard to sleep, the MARS survey has only one sleep-related question compared to three in the SNOT-16.

The discriminant validity of the MARS questionnaire reflects an excellent ability to distinguish between the patient group and the control group (p=0.0000). Responsiveness is the sensitivity to change over time, i.e. the ability of the questionnaire to detect a change when it occurs. Responsiveness statistics are frequently measured using the Standard Response Mean (SRM). Based on the SRM, the MARS questionnaire demonstrated considerable ability to detect changes in QoL after therapeutic interventions. Internal reliability (consistency) is usually determined by calculating Cronbach’s alpha. Cronbach’s alpha for the MARS survey was somewhat lower than expected (α=0.679); however, the value of Cronbach’s alpha increases with an increase in the number of individual items on the survey. Our goal was to create a questionnaire that was convenient to administer and included only the most essential items. Complex and time-consuming questionnaires are usually not well received by patients, which can affect the meaningfulness of the results. Thus, we believe that Cronbach’s alpha approaching 0.7 for 13 items should be considered an indicator of good internal reliability. The RhinoQoL showed a lower internal consistency in patients with ARS compared to patients with CRS.

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The MARS questionnaire is a QoL instrument developed and validated especially for patients with ARS. This survey demonstrated good internal consistency and excellent discriminant validity,
responsiveness, and feasibility for use in daily clinical practice and research.

References


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Appendix 1
The MARS Questionnaire- English translation

Name:  Date:

MARS-The Quality of Life questionnaire for acute rhinosinusitis
Please rate your symptoms and problems according to the following scale:

0- no problem
1- mild problem
2- moderate problem
3- severe problem

1. Blocked nose (one or both sides)  
   0  1  2  3

2. Watery discharge  
   0  1  2  3

3. Smell disturbance  
   0  1  2  3

4. Facial pain or pressure (frontal, facial, irritating in teeth, eyes or ears)  
   0  1  2  3

5. Thick or discoloured discharge (yellow, green...)  
   0  1  2  3

6. Tenderness above the sinuses (frontal, facial, around the eyes)  
   0  1  2  3

7. Postnasal discharge  
   0  1  2  3

8. Headache  
   0  1  2  3

9. Fatigue  
   0  1  2  3

10. Sleep disturbances  
    0  1  2  3

11. Impaired concentration during daily activities (work, school, household)  
    0  1  2  3

12. Feeling irritable  
    0  1  2  3

13. Negatively altered mood  
    0  1  2  3