Minimal clinically important difference (MCID) of the Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS)

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Key Points

Question: What is the minimal clinically important difference (MCID) for the newly developed patient reported outcome measure (PROM) - Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS)?

Findings: In this prospective study of 87 patients who underwent rhinoplasty, the MCID for both the nasal obstruction (SCHNOS-O) and the nasal cosmesis (SCHNOS-C) domains were calculated utilizing the anchor-based approach resulting in 26.0 (16.4) and 22.1 (15.1) points, respectively.

Meaning: The MCID for SCHNOS represents a smallest change in nasal obstruction or cosmesis perceived by patient as important.

Abstract

Objective

To define the minimal clinically important difference (MCID) for both domains of the Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS)

Methods

A prospective study of patients who underwent functional, cosmetic, or combined rhinoplasty operation at a tertiary referral center in 2017– 2018. Anchor-based MCIDs were estimated for both subscales SCHNOS-O and SCHNOS-C using a Likert-like scale to define change in obstruction and cosmesis perceived after the rhinoplasty.

Results

The patients (n=87) were on an average 38 (14.7) years old at the time of surgery, 60 (69%) were women. The average postoperative follow up period was 4.3 months. The average preoperative score (standard deviation) for NOSE was 41.5 (25.9), SCHNOS-O score 54.8 (32.7), and SCHNOS-C score was 50.3 (26.5) points. Respectively postoperatively, the NOSE score was 18.2 (17.3), SCHNOS-O 24.2 (23.2), and SCHNOS-C score was 13.1 (18.2) points. The average changes in scores for NOSE, SCHNOS-O and SCHNOS-C were 23.3 (29.5), -30.6 (38.3) and -37.2 (27.5), respectively. The calculated MCIDs for SCHNOS-O was 26.0 (16.4) and for SCHNOS-C it was 22.1 (15.1) points.

Conclusion

For the obstruction domain SCHNOS-O, the MCID was 26.0 points. For the cosmetic domain SCHNOS-C, the MCID was 22.1.

Cherian, I have switched the “review” function off – it was too messy with all the suggestions. I did not comment much on Intro or Discussion – you have better specialists for that (other authors) – I am a PM&R guy. You have to discuss the weaknesses of the study.

You do not have to show me this anymore. It is okay. A nice short story.

Some common comments:

1) Do not use clauses like “…procedures by the senior author (S.P.M)…” Try to generalize the results, not to localize them. So, use “…a plastic surgeon…” instead. Or better, use nothing of that kind of clauses.

2) Do not use “we” like “…**we** conducted a prospective cohort study…”. Again, it is a localization + most of journals do not permit this form. Please, check through the entire text.
3) Again, “… study was approved by the Stanford University institutional review board…” should be modified into “The study was approved by a university review board…”

I hope, you see what I mean. We do not want our readers to think this way: “Why it is important for the reader to know that a particular surgeon performed a surgery in a particular hospital? If it is important, then sure it affects how the results can be used somewhere else. Otherwise, it would not be mentioned.”

Introduction

There are multiple validated patient-reported outcome measures (PROMs) currently used in rhinoplasty. Nasal obstruction symptom evaluation scale (NOSE)[1]is the most widely used one, but it measures nasal obstruction alone. FACE-Q(R)[2,3] and rhinoplasty outcomes evaluation (ROE)[4] are the two most commonly used PROMs for assessment of nasal cosmesis. While these scales have been validated and are commonly used, their survey forms, measuring scales, and scoring principles are different, making their combined use and interpretation difficult in clinical practice. A substantial number of rhinoplasties address both form and function in a patient. Owing to this, there is a growing consensus to evaluate both functional and aesthetic concerns in all rhinoplasty patients, regardless of chief complaint at initial presentation [5]. The standardized cosmesis and health nasal outcomes survey (SCHNOS) was developed to address this specific need in rhinoplasty patients[6].

SCHNOS is a 10 item self-reported questionnaire designed to evaluate both perceived nasal obstruction and cosmetic disadvantage. It consists of two domains: nasal obstruction, termed the SCHNOS-O (the first four items), and cosmesis, termed the SCHNOS-C (the last six items). SCHNOS is a highly validated questionnaire. The two-factor structure of the SCHNOS has been verified by the confirmatory factor (CFA) analysis[7], and its psychometric properties evaluated by item response theory (IRT) analysis[8]. For every PROM, it is essential to determine the change in score associated with the smallest change in a treatment outcome that a patient would identify as important. This smallest change is the minimal clinically identifiable difference (MCID) of an outcome measure.

For any treatment to be considered effective, apart from a statistically significant difference in treatment outcomes between groups, there also needs to be a meaningful difference clinically [9]. MCID helps identify this particular difference by "determining the magnitude of a clinically relevant treatment effect size from a population perspective"[9] representing the smallest amount of change in an outcome measure that might be considered important by a patient. The two most commonly used approaches used for the estimation of MCID are distribution-based and anchor-based. As the distribution-based approach does not account for the patient's perspective of clinically important change, an anchor-based approach is preferred for MCID estimation. In an anchor-based approach, an anchor question linked to change in outcome measure scores[9] is used as a "reference to determine if the patient is better after treatment compared with baseline according to the patient's own experience"[10].

The objective of the study is to define the minimal clinically identifiable difference for both the nasal obstruction and cosmesis domains of the SCHNOS questionnaire utilizing an anchor-based estimation approach.

Methods

This was a prospective cohort study on patients who underwent cosmetic, functional, or combined rhinoplasty at a tertiary referral center in 2017 – 2018. The inclusion criteria were: age ≥18 years; completed NOSE and SCHNOS questionnaires preoperatively and postoperatively; and a completed response to an anchor question. The study was approved by a university review board.

SCHNOS (Standardized Cosmesis and Health Nasal Outcomes Survey)

The SCHNOS scale measures both nasal obstruction and cosmetic disadvantage.[6] The SCHNOS is a 10-item questionnaire (Figure 1) that uses a Likert-like 0–5 scale ('no problem' to 'extreme problem'). The SCHNOS does not produce a combined total score, but rather two scores for each domain: an obstruction score (SCHNOS-O) and a cosmesis score (SCHNOS-C). The SCHNOS-O is calculated as a sum of the obstruction item scores (items #1 – #4), divided by 20, and multiplied by 100, to base the score out of a possible maximum score of 100. Respectively, a SCHNOS-C score is calculated as a sum of the cosmetic item scores (items #5 – #10), divided by 30, and multiplied by 100, to base the score out of a possible maximum score of 100.

Anchor-based approach for MCID calculations

Three anchor questions were used:

a. How would you describe your cosmetic improvement after surgery?

b. How would you describe your improvement in breathing through your nose after surgery?

c. Overall, how satisfied are you with your surgery?

The following responses were utilized for the three anchor questions:

0. Much better
1. Slightly better
2. About the same
3. Somewhat worse
4. Much worse

Due to the small sample, when calculating the MCID for SCHNOS, responses "slightly better" and "somewhat worse" were combined. That way, the MCID was defined as average changes in SCHNOS-O and SCHNOS-C scores amongst patients who felt slightly better or worse after the surgery. The estimates were reported along with their standard deviations (SD).

Results

The patients (n=87) were on an average 38 (14.7) years old at the time of surgery, 60 (69%) were women. The average postoperative follow up period was 4.3 months. The average preoperative score (standard deviation) for NOSE was 41.5 (25.9), SCHNOS-O score 54.8 (32.7), and SCHNOS-C score was 50.3 (26.5) points. Respectively postoperatively, the NOSE score was 18.2 (17.3), SCHNOS-O 24.2 (23.2), and SCHNOS-C score was 13.1 (18.2) points. The average changes in scores for NOSE, SCHNOS-O and SCHNOS-C were 23.3 (29.5), -30.6 (38.3) and -37.2 (27.5), respectively.

The calculated MCID for SCHNOS-O was 26.0 (16.4) and for SCHNOS-C it was 22.1 (15.1) points (Table 2). The MCID for NOSE was 23.8 (12.9) points.

Discussion

SCHNOS is the first validated PROM to be recommended for functional or cosmetic rhinoplasty[6]. In a longitudinal analysis using the anchor-based approach model, we have attempted to demonstrate the MCID for both the nasal obstruction and cosmesis domains of the SCHNOS questionnaire determined for specifically for patients undergoing functional, cosmetic or combined rhinoplasty procedures. The utility of MCID scores for a PROM is twofold: a) It assists clinicians in making clinical decisions based on patient response to a particular treatment; b) It is used in clinical research for sample size calculation to power a study adequately.[11] Hence the real value of MCID for an instrument evaluating a particular outcome is that it helps in instituting a therapeutic threshold for a treatment outcome from purely a patients perspective. This is the advantage of an anchor-based estimation of MCID as it is objectively evidenced based[10]. Thus, MCID evaluates a study for clinical significance which is different from statistical significance wherein a study can be statistically significant but without any practical value as the results are too small.

The calculated MCID for NOSE from the current cohort was determined to be 23.8 compared to the earlier reported 19.4[12], though higher, are essentially the same. This difference in scores could be attributed to the variability in both baseline and postoperative scores between the two study cohorts and also due to the inclusion of postoperative scores from follow up periods less than three months in 46% of the patient cohort included in this study. Single center-based study, small sample size and the predominance of women in our sample affecting the generalizability of our results add to the limitations of this study.

Strengths of our study were that it was a prospective study by design utilizing a new validated PROM. The longitudinal analyses included pre- and postoperative scores for the estimation of MCID for both the domains of SCHNOS in a specific patient population. For this estimation, we utilized the more objective anchor-based approach that takes into account the patients experience of how better or worse they are after treatment.

Conclusion

For the obstruction domain SCHNOS-O, the MCID was 26 points. For the cosmetic domain SCHNOS-C, the MCID was 22 points. Due to the excellent correlation reported between combined NOSE score and the SCHNOS nasal obstruction domain score (SCHNOS-O), SCHNOS can be used in place of NOSE to assess nasal obstruction.[6]

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Table 1: The mean preoperative, postoperative and change in scores for the entire study sample

N = 87	**Preoperative score, Mean (SD)**	**Postoperative score, Mean (SD)**	**Change in score, Mean (SD)**
NOSE	41.5 (25.9)	18.2 (17.3)	-23.3 (29.5)
SCHNOS-O	54.8 (32.7)	24.2 (23.2	-30.6 (38.3)
SCHNOS-C	50.3 (26.5)	13.1 (18.2)	-37.2 (27.5)

Table 2: The calculated MCID for NOSE, SCHNOS obstruction and SCHNOS cosmesis domain

PROMs	**MCID, Mean (SD)**
NOSE	23.8 (12.9)
SCHNOS-O	26.0 (16.4)
SCHNOS-C	22.1 (15.1)