Proposal for evaluating the quality of reports of surgical interventions in the treatment of trigeminal neuralgia: the Surgical Trigeminal Neuralgia Score

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Object. The aim of this study was to design a checklist with a scoring system for reporting on studies of surgical interventions for trigeminal neuralgia (TN) and to validate it by a review of the recent literature.

Methods. A checklist with a scoring system, the Surgical Trigeminal Neuralgia Score (STNS), was devised partially based on the validated STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) criteria and customized for TN after a literature review and then applied to a series of articles. These articles were identified using a prespecified MEDLINE and Embase search covering the period from 2008 to 2010. Of the 584 articles found, 59 were studies of interventional procedures for TN that fulfilled the inclusion criteria and 56 could be obtained in full. The STNS was then applied independently by 3 of the authors.

Results. The maximum STNS came to 30, and was reliable and reproducible when used by the 3 authors who performed the scoring. The range of scores was 6–23.5, with a mean of 14 for all the journals. The impact factor scores of the journals in which the papers were published ranged from 0 to 4.8. Twenty-four of the studies were published in the *Journal of Neurosurgery* or in *Neurosurgery*. Studies published in neurosurgical journals ranked higher on the STNS scale than those published in nonneurosurgical journals. There was no statistically significant correlation between STNS and impact factors. Stereotactic radiosurgery (n = 25) and microvascular decompression (n = 15) were the most commonly reported procedures.

The diagnostic criteria were stated in 35% of the studies, and 4 studies reported subtypes of TN. An increasing number of studies (46%) used the recommended Kaplan-Meier methodology for pain survival outcomes. The follow-up period was unclear in 8 studies, and 26 reported follow-ups of more than 5 years. Complications were reported fairly consistently but the temporal course was not always indicated. Direct interview, telephone conversation, and questionnaires were used to measure outcomes. Independent assessment of outcome was only clearly stated in 7 studies. Only 2 studies used the 36-Item Short Form Health Survey to measure quality of life and 4 studies reported on the severity of preoperative pain. The Barrow Neurological Institute pain questionnaire was the most commonly used outcome measure (n = 13), followed by the visual analog scale.

Conclusions. Similar to the STROBE criteria that provide a checklist of items that should be included in reports of observational studies in general, the authors' suggested checklist for the STNS could help editors and reviewers ensure that quality reports are published, and could prove useful for colleagues when reporting their results specifically on the surgical management of TN. It would help the patient and clinicians make a decision about selecting the appropriate neurosurgical procedure.

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KEY WORDS • facial pain • Gamma Knife • microvascular decompression •
Surgical Trigeminal Neuralgia Score • stereotactic radiosurgery • trigeminal neuralgia

TRIGEMINAL neuralgia is one of the few chronic neuropathic pain syndromes for which very effective and diverse surgical treatments are available. Recent

international guidelines⁹ and systematic reviews^{39,46,47} identified the shortage of high-quality evidence that can enable patients, physicians, and health policy makers to select the most effective and efficient surgical treatment. Spatz et al.³⁷ reported that patients found it difficult to choose among surgical treatments for TN for the same reasons. It is essential that high-quality evidence that compares different modalities of treatments is available to provide reliable and balanced selection of a surgical treatment by both patients and health care providers. Wente et al.⁴³ analyzed the contents of leading surgical journals and found that only 3% of articles were reports

Abbreviations used in this paper: BNI = Barrow Neurological Institute; BPI = Brief Pain Inventory; GKS = Gamma Knife surgery; IASP = International Association for the Study of Pain; IF = impact factor; MVD = microvascular decompression; QOL = quality of life; RCT = randomized controlled trial; SF-36 = 36-Item Short Form Health Survey; STNS = Surgical Trigeminal Neuralgia Score; STROBE = STrengthening the Reporting of OBservational studies in Epidemiology; TN = trigeminal neuralgia.

of RCTs, and of those, 44% compared different surgical procedures and 56% compared medical therapies in surgical patients. Of the neurosurgical RCTs, only 52% were considered to be of good quality.³⁴ Similar trends were found in a Cochrane review on neurosurgical interventions for TN. Of 11 RCTs, only 3 were considered applicable in practice.

Importantly, no studies addressed MVD, the most advocated procedure for treatment of TN.⁴⁶ Using evidence from nonrandomized interventions requires very carefully designed trials and reporting. A *Health Technology Assessment* report by Deeks et al.¹⁰ provided guidelines for assessment of non-RCTs, which were developed further by Zakrzewska and Lopez⁴⁷ for reporting surgical outcome in TN. The guidelines task force used these, but stipulated that outcomes needed to be assessed by methods independent of the operator and that this needed to be clearly stated. These guidelines have been used by several authors.^{4,22,39}

Furthermore, Schriger and Altman,³⁵ in their *British Medical Journal* editorial, suggested that postpublication review of the medical literature was inadequate because letter writing was not considered rewarding, and therefore either the existence or the lack of letters to the editor is not an indicator of “read” status; perhaps many papers remain unread and their results unused. It has been postulated that authors, when challenged about their results (for example when performing systematic reviews), often do not provide sufficient answers,³⁴ and this is a significant error; the *British Medical Journal* issue of January 2012 highlighted how missing data and incomplete reporting can harm patients.¹⁷ Given the difficulty of performing RCTs of widely accepted surgical techniques, it is increasingly important to ensure that surgical reports are written to uniform standards, allowing results to be used in meta-analyses.⁵ Rughani et al.³¹ showed clearly how different conclusions can be reached when using national databases when compared with small series on TN.

It is increasingly necessary to ensure that all reports are written using a similar structure so that they can be compared; this led to the Consolidated Standards of Reporting Trials (CONSORT) statement in 1996 for the reporting of RCTs, which has now been accepted by all the major journals.² However, not all studies are RCTs, and it has been increasingly recognized that these reports also need a more structured format. This then led to the Statement for Reporting Studies of Diagnostic Accuracy (STARD).³ However, this still did not cover all types of studies, and in 2007 a group of epidemiologists, methodologists, statisticians, researchers, and journal editors put forward a proposal for how reporting of observational studies could be improved—this was called the STROBE⁴¹ statement (<http://www.strobe-statement.org/>). This statement is now being increasingly endorsed by both medical and surgical journals, and may be the template that could be used for reporting TN studies.

Aim of Study

The aim of this study was to put forward a checklist and a scoring system in line with the STROBE checklist for quality assessment of papers that report specifically

on surgical treatments of TN, to improve the quality of those reports and aid authors and editors.

Methods

MEDLINE and Embase databases were searched for publications reporting surgical therapies for TN in the period between January 2008 and January 2010. The search strategy used was based on one used for a Cochrane systematic review⁴⁶ and modified according to the criteria provided.

Inclusion Criteria

1. Papers reporting primary outcome parameter: effect on pain after surgery.
2. Idiopathic TN.
3. Prospective and retrospective studies.
4. Randomized clinical trials.
5. Language: English.
6. All gasserian ganglion and posterior fossa procedures.
7. Redo surgery; that is, separate reports of patients who had 1 prior procedure.

Exclusion Criteria

1. Technical, anatomical, nontrial experiments, economic, or methodological reports.
2. Reviews, editorials, surveys, guidelines, or commentaries.
3. Case reports including < 5 patients.
4. Non-TN papers.
5. Symptomatic (secondary) TN or TN with multiple sclerosis.
6. Peripheral treatments distal to the gasserian ganglion.

Once the papers were identified the titles and abstracts were then read independently by 2 authors (H.A. and J.Z.). If the abstract fulfilled the criteria or there were insufficient data in the abstract, the full papers were obtained and read prior to selection.

A checklist and scoring system, the STNS (Table 1), was devised based on the STROBE statement, the report by Deek et al.,¹⁰ previous recommendations from Zakrzewska and Lopez in 2003,⁴⁷ the TN guidelines committee, and subsequent use of the latter recommendations in other reports.^{9,39} A range of scores from 0 to 30 was then applied to the papers that fulfilled the inclusion criteria, with scores > 25 being considered high quality. The results were presented at the Society of British Neurological Surgeons' scientific meeting in Leeds in September 2012. Feedback from the discussion was used to refine the scoring system further.

A randomization software program (RandomAllocations Software version 1.0, M. Saghaei, Department of Anesthesia, Isfahan University of Medical Sciences) was used to randomize the papers to 3 equally distributed groups to be scored by 3 of the authors (H.A., B.M., J.Z.). Ten percent of the scored papers were redistributed among the 3 authors, in such a way that no author reviewed the same paper twice, for validation and consis-

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TABLE 1: The STNS combined with STROBE to design a scoring system*

Criterion	Score
Title, Abstract, & Introduction	
abstract provides an informative & balanced summary of what was done & what was found	1
Methods section	
presents key elements of study design early in the paper	1
gives TN diagnostic criteria	1
uses International Headache Society or IASP criteria	1
provides a broad description of op technique: e.g., max temp given (RFTC), no. of sites, & dose provided (by GKS)	1
sensory assessment done & any deficits from previous treatments stated	1
FU through interview, telephone, questionnaire (score 0 for notes only)	1
if questionnaire is used, is it provided or reference provided?	1
is it a validated questionnaire?	1
clearly defines all outcomes, exposures, predictors, potential confounders, & effect modifiers	1
describes any efforts to address potential sources of bias, clear statement on use of independent observers	1
describes all statistical methods, including those used to control for confounding	1
explains how missing data were addressed, sample size at the start & at the end, w/ percentage of patients lost to FU stated	1
Results section	
gives characteristics of study participants (e.g., demographic, clinical, social)	1
gives characteristics of laterality & divisions of CN V involved	1
details of previous op treatments given	1
summarizes FU time (e.g., average, total amount, range)	1
FU period of ≥ 12 mos	1
states op findings & failures (MVD)	1
reports nos. of outcome events or summary measures over time, reports outcomes separately for complete & partial pain relief, & defines recurrence	1
were the outcomes reported separately in case of a mixed TN cohort?	1
provides a baseline measure of pain/QOL	1
provides a KM graph	1
the KM graph is correctly constructed	1
provides the exact no. of patients at the end of the KM graph over 3 yrs	1
reports detailed complications related to CN V	1
reports detailed complications outside CN V	1
uses severity & time scales when reporting complications	1
reports immediate op complications	1
reports mortality rate	1
total	30
additional data suggested by STROBE for Discussion section	
summarize key results w/ reference to study objectives	
discuss limitations of study, taking into account sources of potential bias or imprecision; discuss both direction & magnitude of any potential bias	
give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, & other relevant evidence	
discuss the generalizability (external validity) of the study results	
give the source of funding & the role of the funders in the present study &, if applicable, in the original study on which the present article is based	

* CN = cranial nerve; FU = follow-up; KM = Kaplan-Meier; max temp = maximum temperature; RFTC = radiofrequency thermocoagulation.

tency of data acquisition. In cases of discrepancy the review was discussed between the authors.

The extracted data and scores were entered directly into a Microsoft Excel spreadsheet generated from a Mi-

crosoft Access database. The IFs of all the journals in which reports were found were obtained from the *Journal Citation Reports* (2010), an annual publication by the Healthcare & Science division of Thomson Reuters. For

journals not included in the *Journal Citation Reports*, an IF of 0 was allocated. The journals were also divided into 2 groups according to the journal's mission statement, readership, and editorial board: 1) mainstream neurosurgical journals; and 2) nonneurosurgical journals.

Statistical Analysis

When examining the correlation of the scores with the IF, the quality scores were noncontinuous categorical data and did not distribute normally. Therefore nonparametric statistical analysis was performed: the Spearman rank correlation test to assess the correlation between the quality scores and IF, and the unpaired t-test for group comparisons. Given the single comparison decided a priori, the significance level was set at $p < 0.05$.

Results

There were minor discrepancies between authors on some of the scored items. The most significant of these was regarding the reporting on the baseline measure of pain; an agreement was reached to credit only papers that reported the actual baseline measure of pain and not those that just stated that it was measured. This meant that 4 papers instead of 17 were awarded 1 point in this category.^{12–14,45}

Identified Papers

Fifty-nine of 584 papers fulfilled the inclusion criteria. Fifty-six manuscripts were available for review and manuscripts for 3 papers could not be obtained, because those papers were not indexed in the British Library.

The 56 articles were published in a wide range of journals, from principal neurosurgical journals to periodicals that most neurosurgeons would not access regularly. The IF of the journals cited in the *Journal Citation Reports* ranged from 0.408 to 4.791 (Table 2). The data extracted from the included studies are shown in Table 3.

Study Design

Most studies (77%) were retrospective. There were 3 multicenter studies (5%). A structured abstract with clearly stated objectives was provided in 93% of the studies. Few studies reported on specific parameters that prognosticate outcome—that is, age, operative techniques, type of TN,^{26,32} and endoscopic identification of neurovascular compression.⁷ Several papers reported repeat procedures in relatively small numbers of patients,^{18,28,40,42} whereas others reported them within the context of the whole cohort of patients. In 23 studies patient databases were available, but the means by which the selection of patients was achieved was not stated in most of the studies.

Demographic Data and Diagnostic Criteria

Sample sizes at the start varied from 4012 in the study by Chen et al.⁶ to 6 in the paper by Ugwuanyi and Kitchen,⁴⁰ with 86% reporting more than 30 patients. Those reporting the lowest numbers were repeat operations. Most studies provided basic demographic data. In only 20 studies (35%) the diagnostic criteria used were reported, of which 13 (22.8%) used diagnostic criteria from the Inter-

national Headache Society or the IASP. Only a few studies clearly defined TN according to the Burchiel classification model of Type 1 and Type 2.^{11,25,28,32} and analyzed results separately in these groups. Others stated they had mixed groups: 18 (31.5%), but only 12 (66.6%) of those reported the outcomes separately. Diagnostic criteria in 1 series were obtained retrospectively based on a series of 40 binomial questions administered by an independent interviewer to patients up to 10 years post-MVD.²⁶ Only 4 (7%) reported a baseline level of pain^{12,13,15,45} to which the subsequent postoperative assessments could be made. Statistical methods were provided in 34 studies (59.6%).

Surgical Procedures

The most frequently reported procedures were MVD and GKS, and the largest series reported glycerol and novocaine injections into the gasserian ganglion. Operative procedures were well described in most studies, and the number of isocenters and the treatment dose used for GKS were provided in 30 (96.7%) of 31 and 29 (93.5%) of 31 studies, respectively. Reports on MVD procedures provided details of neurovascular compression in 17 (73.9%) of 23 papers, and only 6 (26.1%) of 23 detailed findings on MRI. Some of the papers reporting on MVD or GKS procedures provided no technical details.

Postoperative Outcomes

Only 22 papers (38.5%) stated the percentage of patients who failed to get any pain relief. Just under half of the studies (26 [45.6%]) provided a Kaplan-Meier analysis, but only 10 (38.4%) of those 26 studies indicated how many patients were still in the study at the end of that analysis. Table 3 shows that outcome measures were not clearly defined. Complications were consistently reported, but very few studies reported them in relation to time after surgery. Sensory deficit following GKS was reported in half of the studies. The mortality rate was not stated in GKS studies, and it was stated in 20 (62.5%) of the 32 non-GKS studies. Some centers have used both questionnaires and interviews as a means of follow-up, but this was not universal. Only 7 studies (12.2%) clearly stated that an independent observer was used to collect outcome data. The most commonly used outcome measure was the BNI scale or some variant of it. The QOL was assessed in 2 studies by using the SF-36.^{1,27} Azar et al. found no other studies in which the SF-36 was used; they also used the BNI scale in their study to make some comparisons. Two studies used the validated BPI.^{22,23} There was 1 study comparing the cost analysis of Cyberknife (stereotactic radiosurgery) and MVD.³⁸

The Scores

The maximum STNS that can be achieved is 30; of the selected 56 papers included in this analysis, the scores ranged from 6 to 23.5 (Table 2). One of the two lowest-scoring papers (scoring 6 each) was published in a journal with an IF of 2.87, whereas the other was published in a journal not indexed by Thomson Reuters. The highest-scoring paper, with a score of 23.5, was published in a journal with an IF of 2.739. Our analysis showed that the

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TABLE 2: The journals publishing the 56 studies, with 2010 IFs and STNS*

Journal	IF	Average Score
mainstream neurosurgery journals w/ published IFs		
<i>Clinical Neurology & Neurosurgery</i>	1.64	19.00
<i>World Neurosurgery 2010</i>	0.68	18.00
<i>Zentralblatt für Neurochirurgie</i>	0.95	18.00
<i>Journal of Neurology, Neurosurgery & Psychiatry</i>	4.79	17.50
<i>Neurochirurgie</i>	0.41	16.50
<i>Neurosurgery</i>	3.30	16.35
<i>Neurosurgical Review</i>	2.26	16.00
<i>Journal of Neurosurgery</i>	2.74	15.60
<i>Canadian Journal of Neurological Sciences</i>	1.18	15.50
<i>Journal of the Korean Neurosurgical Society</i>	0.61	14.50
<i>British Journal of Neurosurgery</i>	0.97	14.25
<i>Acta Neurochirurgica</i>	1.33	13.67
<i>Neurosurgical Focus</i>	2.35	13.00
<i>Stereotactic & Functional Neurosurgery</i>	1.88	13.00
<i>Surgical Neurology</i>	1.26	12.00
neurosurgery journals w/ no published IFs		
<i>Egyptian Journal of Neurology, Psychiatry and Neurosurgery</i>	NA	10.50
<i>Pan Arab Journal of Neurosurgery</i>	NA	10.50
<i>Progress in Neurological Surgery</i>	NA	7.00
<i>Rawal Medical Journal</i>	NA	7.00
nonneurosurgery journals		
<i>International Journal of Radiation Oncology Biology and Physics</i>	4.50	20.25
<i>Head & Face Medicine</i>	1.04	16.00
<i>Neurology India</i>	0.83	14.50
<i>Clinical Journal of Pain</i>	3.11	14.00
<i>Neurological Sciences</i>	1.22	13.00
<i>Cell Biochemistry and Biophysics</i>	4.31	11.50
<i>Journal of Neuroimaging</i>	1.29	10.50
<i>Technology in Cancer Research and Treatment</i>	1.81	9.00
<i>Journal of Clinical Neuroscience</i>	1.17	8.50
<i>Neuroradiology</i>	2.87	6.00

* NA = not applicable.

quality score of the reports and the IF of the journals in which they appeared did not correlate (Spearman rank correlation, $p = 0.213$; 2-sided $p = 0.11$).

We used the principal neurosurgical journals with published IFs (Table 2), in which the median STNS was 15.6 (interquartile range 12–19) and the mean was 15.52, and compared them with all the other journals grouped together, with a median STNS of 10.5 (range 6–20.25) and a mean of 11.3. The papers reported in the principal neurosurgical journals had a very significantly higher mean STNS when compared with the other journals (unpaired 2-tailed t-test, $p = 0.0012$). There was no significant difference between the IFs of the principal neurosurgical journals and those of the other journals.

Discussion and Recommendations

To assess the quality of reporting of surgical interven-

tions for TN we devised a checklist and scoring system, the STNS, based on previous publications^{9,10,39,46,47} and the STROBE statement. The STNS showed that reporting is variable and inconsistent. The scores were higher in reports from neurosurgical journals when compared with other journals. Some studies were published in high-IF journals that we assume were not routinely accessed by neurosurgeons, and the quality of reporting in these was inconsistent. Patient-related outcome measures were poorly reported.

Thus, there is a need to improve the quality of neurosurgical reporting; Kiehna et al.¹⁹ have also shown that results of intracranial neurosurgery RCTs in the principal neurosurgical journals are of a lower standard than in major medical journals. It has been shown that standardized checklists for assessing neurosurgical RCTs could be reliably used by reviewers of different experience levels and

TABLE 3: Data extracted from the 56 included studies*

Characteristic	No. (%)
overall characteristics	
abstract in a structured format	52 (93)
prospective design	10 (18)
retrospective design	43 (77)
study design unclear	3 (5)
study population	
presence of basic demographic data	49 (87)
diagnostic criteria clearly stated	20 (36)
details of FU method stated	
interview	5 (9)
questionnaire	19 (34)
telephone	4 (7)
interview & questionnaire	11 (20)
various	2 (4)
not stated	15 (27)
type of questionnaire used†	
BNI scale	13 (46)
other	13 (46)
BNI scale, VAS	1 (4)
BNI, VAS, SF-36	1 (4)
definitions & outcome measures	
primary outcome measures defined (complete & partial pain relief)	32 (57)
report outcomes separately for complete & partial pain relief	30 (54)
recurrence defined (minor & major)	27 (48)
preop pain levels reported	4 (7)
sensory assessment	
not reported	27 (50)
done postop	21 (38)
done preop	4 (7)
done pre- & postop	4 (7)
patients treated more than once	
0%	2 (4)
<10%	10 (18)
≥10%	22 (39)
unclear	21 (38)
sample size & length of FU	
sample size at start of FU <30 patients	8 (14)
sample size at start of FU ≥30 patients	48 (86)
FU 1–5 yrs	22 (39)
FU >5 yrs	26 (46)
FU period unclear	8 (14)
type of intervention	
SRS	25 (45)
MVD	15 (27)
MVD & SRS	3 (5)
PBC	3 (5)
RFTC	3 (5)
MVD, PGI, RFTC	1 (2)

(continued)

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TABLE 3: Data extracted from the 56 included studies* (continued)

Characteristic	No. (%)
type of intervention (<i>continued</i>)	
nerve combing	1 (2)
PBC, MVD	1 (2)
redo MVD	1 (2)
PGI	1 (2)
PBC, PGI	1 (2)
MVD, RFTC, PGI, SRS	1 (2)
% of patients lost to FU	
0%	19 (34)
<10%	15 (27)
10–20%	5 (9)
>20%	2 (4)
unclear	15 (27)
morbidity & mortality	
mortality rate stated	19 (34)
reports immediate op complications	26 (46)
reports detailed complications of CN V	46 (82)
reports details of complications outside CN V	43 (77)
reports complications in relation to time & severity	20 (36)
uses KM for pain relief outcomes	26 (46)

* PBC = percutaneous balloon compression; PGI = percutaneous glycerol injection; SRS = stereotactic radiosurgery; VAS = visual analog scale.

† A questionnaire was used in 28 papers (50%).

thus can improve quality. This is important because there is a risk that readers may underestimate or even ignore the role of poor design or reporting when deriving conclusions from reports published in more recognized journals or in journals with a higher IF. It is possible that journals that do not routinely publish reports on TN are less likely to have the relevant expertise, and so may not be as rigorous in the reviewing process. This explains why poorly scored reports were published in high-IF nonneurosurgical journals.

Our study showed that preoperative levels of pain, presence of sensory changes, and impact of the pain on the QOL were not consistently reported. It is essential to measure baseline pain and its impact preoperatively to evaluate outcomes because this is often missing, even in the field of pain medicine.²⁴ Some authors,^{11,25,26,44} realizing the importance of baseline assessments, attempted to estimate pain preoperatively by interviewing patients postoperatively; in some instances this was done 10 years after the intervention was performed. Another problem when assessing pain outcomes is that TN is episodic, so it is not just the pain intensity that is important but also the frequency and number of branches involved, which led Degen and Brennum¹¹ to suggest a pain vector that takes this into account (<http://tn.neurokirurgi.info>).

It is now established that a range of outcome measures from different perspectives needs to be used; for example, patient-reported outcomes, independent assessments such as those provided by MRI, and clinical events and therapeutic outcomes such as length of hospitaliza-

tion, treatment failure, and repeat surgery. The SF-36, the most widely used generic patient-related outcome measure, was used both pre- and postoperatively by Azar et al.¹ and Pan et al.²⁷ However, Garratt,¹⁶ when commenting on the SF-36, argued that there was an urgent need for “an appropriate and standardised application of measures that include aspects of health and quality of life, and end points that are of genuine importance to patients.” There is ample evidence that outcome measures, if not assessed in an independent, blinded way, are subject to bias and are associated with significantly larger positive treatment effects than blinded outcome assessments.²⁹

Recently the IASP¹⁴ put forward suggestions for a variety of outcome scales for patients with chronic pain, some of which are used in TN. Lee et al.²⁰ noted that these requirements have extended the recommended BPI to take into account the impact that TN specifically has on daily living. They have validated its use as a screening tool, but its usefulness for monitoring outcomes over time remains to be established. This is a significant step forward because QOL and impact on daily living are crucial outcome measures, because in some patients pain relief is achieved at the cost of anesthesia dolorosa or loss of hearing; in a musician, for example, this can render the QOL worse than prior to the operation. It is clear that complications and their time course directly influence the QOL, which necessitates a priori risk-balancing before selecting an appropriate surgical procedure.

Questionnaire development and testing is a complex

process, as Lee et al.²⁰ have illustrated. Once questionnaires have been tested and shown to be valid, reliable, and reproducible, they cannot be altered by addition or subtraction of items, as has been done by some authors.^{21,33} Rogers et al.³⁰ devised the BNI scoring system, which combined pain intensity and the use of medication. It was not specified how this scale was to be used, for example, from data in the medical records or from patients' completed forms. This particular scale was used in several studies. Some reported using it prior to surgery and stated that the patients' BNI scores were Grade IV or V,^{12,15,27,36,45} showing that patients who underwent surgery had intractable pain. Because pain relief after GKS is not immediate, patients remain on medication for several months. Some patients may become reluctant to stop their medication for fear of pain recurrence, and so would provide lower scores on the BNI scale than would be expected. The BNI Facial Numbness Scale was applied by others.^{8,15} It is a subjective assessment by the patient, which may not always correlate with neurophysiological testing, a more independent assessment.

The STROBE statement emphasizes the need to define all outcome measures and to provide details of the methods of assessment. We would propose the use of the BPI-Facial as the essential outcome measure because it measures not only intensity of pain but also the impact of the disease both on general activities of daily living and other specific activities such as the ability to eat.

When reviewing papers it may be useful to use the guidelines provided by STROBE for the discussion, which are shown in Table 1, but which were not used to generate a score.

Proposal and Conclusions

Our recommendations are as follows. 1) The STNS now needs to be used by authors, journal editors, and reviewers as a checklist when reporting on surgical outcomes in patients with TN. 2) A similar study to ours can be repeated in the future once the STNS is in use to determine whether its widespread use can improve the reporting and hence the generalizability of surgical interventions for TN. Improved generalizability of data could help guide patients, health care professionals, and policy makers in making decisions on the most effective treatments.

Disclosure

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