



A step backward: The 'Rough' facial nerve grading system



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ARTICLE INFO

Article history:

Paper received 5 August 2012

Accepted 26 November 2012

Keywords:

Facial palsy

Facial nerve grading system

Interrater reliability

Subjective scale

House–Brackmann grading system

ABSTRACT

Objectives: Several modalities currently exist to rate the degree of facial function clinically but even though it has significant limitations, the most widely used scale is the House–Brackmann grading system (HBGS). A simplified scale is introduced here, the 'Rough' Grading System (RGS – Grade I: normal movement; Grade II: slight paralysis; Grade III: frank paralysis with eye closure; Grade IV: frank paralysis without eye closure; Grade V: almost complete paralysis with only slight movements; Grade VI: total paralysis). The aim of the present study was to verify the interrater reliability and the interscale validity of this simplified grading system.

Study design: Scale validation study based on a prospective cohort.

Methods: Fifty patients with facial palsy, consecutively referred to our department were filmed while performing some codified facial movements. Then two independent groups (one rating using the HBGS, the other rating using the RGS) assigned a grade after reviewing the videos. The time required for the rating was also noted.

Results: The HBGS showed a mean value of interrater agreement of 0.46 while the RGS showed a mean value of 0.59. The concurrent validity between HBGS and RGS ranged from 0.86 to 0.90 ($p < 0.001$ for every comparison). There was no statistically significant difference between HBGS and RGS in the mean time taken for rating ($p = 0.15$).

Conclusions: The RGS reached an adequate level of interrater reliability, higher than the HBGS. The correlation between the two scales is high and the times required for rating are similar. The present results may justify the use of the RGS in routine clinical practice.

Level of evidence: N/A.

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1. Introduction

Facial paralysis remains a devastating clinical condition despite advances in medical (Scheller and Scheller, 2012) surgical (Biglioli et al., 2012), and physical therapy interventions. Patients are plagued with brow position and movement abnormalities, eye closure issues, midfacial asymmetries, and poor oral function

resulting in speech and articulation problems, inability to smile, and lower lip asymmetry. In addition, lacrimation, salivation, and taste may be affected to varying degrees.

A grading of facial paralysis is necessary for determining and reporting the spontaneous course of facial paralysis and especially the results of medical or surgical treatments. Multiple measurement scales have been proposed in the literature over the years. In 1983, the House facial paralysis grading system was introduced (House, 1983). In 1985, this grading system was modified by Brackmann (House and Brackmann, 1985). This latter system (the House–Brackmann grading system – HBGS) has since been accepted by the American Academy of Otolaryngology-Head and

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Neck Surgery in the United States as the standard used in reporting results. The HBGS system has been extremely helpful in standardizing reporting of facial nerve paralysis, and although many of the other grading scales have their advantages, none has duplicated the global appeal and ease of use of the HBGS. This scale can require a certain time for rating, and in some cases, the mixing of synkinesia, and the detailed specification of some of the parameters regarding single muscles or movement in the face, can generate difficulties in assigning a definite grade (Murty et al., 1994; Rickenmann et al., 1997).

In clinical practice, the evaluation of the grade of facial nerve paralysis is often encountered by many medical specialists (mainly neurologists, otolaryngologists, maxillofacial surgeons, and neurosurgeons) and it is very often found in patients' charts, visit reports and in every kind of clinical documentation encountered. Intuitively it seems very unlikely to the authors of this paper that in routine clinical practice evaluation is performed thoroughly, considering every single descriptive parameter of the HBGS, in its original format.

Based on our experience, the authors postulate that it is very likely that HBGS is only used roughly, meaning only considering the most obvious findings in evaluating the patient. Grade I is easily recognizable (normal function), as is grade VI (total paralysis). In a simplified use of the HBGS, it is also likely that grade II would be assigned in cases where paralysis is mild, while grade V would be assigned where paralysis is almost complete, and where only slight movements are detected. Roughly, grades III and IV would be assigned in cases of frank paralysis distinguishing between them by a parameter that is very easily recognizable, complete eye closure under effort. In a rough and rapid use of the scale, it is also likely that synkinesia or dyskinesia would not be evaluated, the more difficult identification and rating of them compared to voluntary facial movements, and their later appearance, so we postulate that these phenomena are less frequent and probably less considered in assigning a grade function by HBGS during routine clinical evaluations. Similarly, dynamic movements are postulated by the present authors to prevail in the overall assignment of the grade. So summarizing and simplifying, the HBGS would become a sort of rougher or simplified scale, which we have called the 'Rough' Grading System (RGS) with grades defined as follows:

Grade I: normal movement; Grade II: slight paralysis; Grade III: frank paralysis with eye closure; Grade IV: frank paralysis without eye closure; Grade V: almost complete paralysis with only slight movements; Grade VI: total paralysis. The scale would apply to dynamic movements, and no evaluation of dyskinesia would be made.

The aim of the present study was to verify interrater reliability (to define the agreement between raters) and concurrent validity (to define the correlation between HBGS and RGS) of this 6-item simplified scale, derived from the HBGS.

2. Materials and methods

Patients with facial palsy, consecutively referred to the Otolaryngology Department of the University Hospital of Modena, Italy, between January and December 2011 and reaching the attention of three of the authors (MAC, AP, AG), were asked to participate in this study after adequate information had been provided to them. In addition patients without evident paralysis who had undergone parotidectomy, were considered for inclusion to have a greater chance of obtaining grade I patients for the validation. The total number of patients included was chosen arbitrarily as 50, similar to earlier validation studies of facial nerve grading scales (Rickenmann et al., 1997; Yen et al., 2003; Ikeda et al., 2003; de Ru et al., 2006).

The patients were filmed, while performing some codified movements (raise the eyebrows, blink, close the eyes tightly, wrinkle the nose, whistle, blow out the cheeks, smile, show the teeth, and maximum grimace with platysma contraction). The onset of palsy, age, sex, cause of the paralysis, and date of the recording were noted in an appropriate ad-hoc database for further analyses, and all of the videos were stored on a hard-disk drive. Between December 2011 and January 2012, two independent groups, each composed of three raters (similar to former validation studies) (Ahrens et al., 1999; Yen et al., 2003; de Ru et al., 2006; Kecskés et al., 2011) separately assigned a grade to each patient after reviewing the videos. Each group was composed of otolaryngologists with different degrees of experience (one senior specialist, one junior specialist, one resident). EC, AG and FMG rated patients using the HBGS (Table 1) while DM, MAC and AP rated patients using the RGS (Table 2). The grade assigned and time required for the rating were noted.

Table 1
House–Brackmann grading system.

Grade	Description	Characteristics
I	Normal	Normal facial function in all areas
II	Mild dysfunction	Slight weakness noticeable only on close inspection. At rest: normal symmetry of forehead, ability to close eye with minimal effort and slight asymmetry, ability to move corners of mouth with maximal effort and slight asymmetry. No synkinesia, contracture, or hemifacial spasm.
III	Moderate dysfunction	Obvious but not disfiguring difference between two sides, no functional impairment; noticeable but not severe synkinesia, contracture, and/or hemifacial spasm. At rest: normal symmetry and tone. Motion: slight to no movement of forehead, ability to close eye with maximal effort and obvious asymmetry, ability to move corners of mouth with maximal effort and obvious asymmetry. Patients who have obvious but not disfiguring synkinesia, contracture, and/or hemifacial spasm are grade III regardless of degree of motor activity.
IV	Moderately severe dysfunction	Obvious weakness and/or disfiguring asymmetry. At rest: normal symmetry and tone. Motion: no movement of forehead; inability to close eye completely with maximal effort. Patients with synkinesia, mass action, and/or hemifacial spasm severe enough to interfere with function are grade IV regardless of motor activity.
V	Severe dysfunction	Only barely perceptible motion. At rest: possible asymmetry with droop of corner of mouth and decreased or absence of nasal labial fold. Motion: no movement of forehead, incomplete closure of eye and only slight movement of lid with maximal effort, slight movement of corner of mouth.
VI	Total paralysis	Loss of tone; asymmetry; no motion; no synkinesia, contracture, or hemifacial spasm.

Table 2
Rough grading system. The scale applies to dynamic movement, and no dyskinesia evaluation is present.

Grade	Characteristics
I	Normal movement
II	Slight paralyses
III	Frank paralyses with eye closure
IV	Frank paralyses without eye closure
V	Almost complete paralyses with only slight movements
VI	Total paralyses

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