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Myasthenia gravis outcome measure: development and validation of a disease-specific self-administered questionnaire

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Abstract We describe the development and validation of an outcome measure for patients with myasthenia gravis (MG) and show the correlation of the items with conventional MG measurements. In stage 1, item generation, a group of methodologists, clinical experts generated a list of 56 items. The list was based on (1) a previous study on an MG sample, (2) clinical experience and (3) items proposed by MG patients. In stage 2, reduction of items, the list was reduced on the basis of results from field testing (41 patients completed the 56-item questionnaire). In stage 3, reliability and validity were assessed. A 25-item MG questionnaire (MGQ) was generated. Results were related to conventional measures of MG severity. Furthermore, the MGQ appeared reliable, sensitive and reproducible. The questionnaire was validated as an outcome measure.

Key words Myasthenia gravis • Patient-oriented • SF-36 Self-administered questionnaire • Disease-specific questionnaire • Quality of life • Validation

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Introduction

The clinical picture in myasthenia gravis (MG) patients varies from ocular impairment only (such as ptosis or diplopia) to severe generalized muscle involvement (eventually to respiratory failure) [1]. Health-related quality of life (HRQoL) measures, obtained through patient-oriented tools (self-administered questionnaires), are now considered essential in the evaluation of neurological diseases especially in those pathologies that affect the general status of the patients (such as MG) [2–5].

Previous studies [6, 7] evaluating HRQoL in patients with MG through application of the most used generic measure, SF-36, have demonstrated that HRQoL assessment is important in patients with MG. However, it is well known that disease-specific tools are more sensitive than generic measures [8]. Recently, the Task Force of the Medical Scientific Advisory Board of the Myasthenia Gravis Foundation of America suggested developing a disease-specific questionnaire for the assessment of outcome measures in this pathology [2].

This paper describes the development of an evaluative outcome measure for patients with myasthenia gravis (MG) and correlates the items and the global score with results from conventional clinical measurements of MG. The goal was to produce a brief, self-administered measure of functional status to be used by clinicians in daily practice and to be applied as a research tool.

Materials and methods

Our approach was consistent with previously described strategies for scale development, and included three stages [9]: Stage I, item generation; Stage II, item reduction; and Stage III, reliability and validity testing. Our specific methodology for developing the MG questionnaire (MGQ) to evaluate functional status is described in the following paragraphs (Table 1).

Table 1 Development of a disease-specific outcome measure: the Myasthenia Gravis Questionnaire

Stage	Methods	Results
Stage 1, Item generation	Proposal of items by clinical experts and MG patients, and some items inspired by SF-36	List of 56 items
Stage 2, Item reduction	Administration of the 56-item questionnaire and clinical assessment of 41 MG patients. Analysis of item responses using statistical reduction techniques. Generation of MG score	List of 25 items
Stage 3a, Reliability	Analysis of the correlation between MG score and conventional clinical measurements	Significant correlation: reliability
Stage 3b, Validity	Tests of reproducibility, responsiveness, internal consistency, etc.	Reliability of all tests

Stage I. Item generation

A group of methodologists and clinical experts in the field of MG generated a list of 56 items, including:

1. Items inspired by the official Italian version of the SF-36 [4, 10]. These were included because a previous study [6] demonstrated that questions about a patient's activities during a typical day, problems with work, perceptions of health and emotional status were highly related to conventional measurements of MG severity.
2. Items formulated by a clinical expert.
3. Items proposed by 20 MG patients (12 women; mean age 54.5 years, range 21–77 years). According to Osserman's classification, 4 patients were included in grade 1, 6 in grade 2a, 5 in grade 2b, 2 in grade 3, and 2 in grade 4; one patient was asymptomatic at the moment of clinical evaluation.

Most items on the proposed scale have 3 possible responses (0, definite inability; 1, partial inability; and 2, ability). Some items on the scale evaluate the presence or absence of a deficit as a dichotomous categorical score with a forced-choice yes or no answer (scored 2 for absence of deficit and 0 for deficit). A period of 1 week was chosen to minimize problems with recall over a more extended time interval and because it was compatible with the disease characteristics.

Stage II. Item reduction

The list of proposed questions was reduced on the basis of results from field testing in which MG patients completed a 56-item questionnaire. To do so, a prospective study was conducted on 41 MG patients (22 women; mean age 56.7 years; range 19–86 years) admitted to the Department of Neurology between April 2001 and August 2001. The study group was composed of (1) patients with previous MG diagnoses admitted for worsening of the disease (10 cases); (2) in-patients with previous MG diagnoses referred for the periodical control of therapy (29 cases); and (3) new patients with suspected MG in whom the commonly accepted MG diagnostic criteria [11] were satisfied (2 cases). The MG patients who participated in field testing (Stage II) were not the same as those who assisted in item generation (Stage I).

Disease severity was scored according to a modified version of Osserman's classification [12]: *grade I*, focal disease (restricted to the ocular muscles); *grade II*, generalized disease that is either mild (IIa) or moderate (IIb); *grade III*, acute severe generalized disease with respiratory failure; and *grade IV*, severe generalized disease with respiratory failure (progression within 2 years).

According to Osserman's classification, 5 patients were included in grade 1, 11 in grade 2a, 9 in grade 2b, 1 in grade 3, and 3 in grade 4; 12 patients resulting asymptomatic at clinical evaluation were scored "0" for statistical analysis.

The 41 patients underwent a neurological and clinical examination as follows:

- Diplopia (0, absent; 1, present)
- Ptosis (0, absent; 1, present)
- Dysphagia (0, absent; 1, present)
- Dysarthria (0, absent; 1, present)
- Muscle function of upper facial area, scored as 0, no deficit; 1, mild; 2, moderate; and 3, severe deficit)
- Muscle function of lower facial area, scored as 0, no deficit; 1 mild; 2, moderate; and 3, severe deficit)
- Neck flexor, scored according to the scale of the British Medical Research Council (BMRC) [13]
- Duration of arm abduction, measured in seconds
- Abductor digiti minimi, scored on the BMRC scale [13]
- Respiratory dyspnea (0, absent; 1, present)
- Duration of the Mingazzini position, measured in seconds

The clinical examination was carried out under the effect of Mestinon (usually 1–2 h after assumption) because the study was focused on the assessment of the patient during a typical day (i.e. while undergoing therapy). Both the clinical examination and Osserman's assessment were performed "blind" (the physician did not know the results of the myasthenia gravis questionnaire).

The global score of the MGQ was obtained from the sum of the items (a higher score means a better condition).

Stage III. Validity and reliability testing

Validity is an index of how well a test measures what it is supposed to measure. Criterion validity is the correlation of a scale with a valid, accepted and, ideally, universally acknowledged measure of the trait or disorder under study. When there is no universally-acknowledged measure of the attribute under study, construct validity is generally sought to demonstrate the validity of a scale. To calculate construct validity, a theoretical construct is invoked

between the attribute under study and the other attributes that are expected to be related. Therefore, the relationship between these attributes is measured. Because there is no universally acknowledged measure of the perspective of MG patients, construct validity was sought to support the overall validity of the questionnaire.

Reliability is a measure of consistency or degree of dependability, which can be divided into two major classes: internal consistency, a measure of equivalence, is the ability of the scale to measure a single coherent concept; and reproducibility, or test-retest reliability, which is a measure of stability, is the ability of a scale to give the same results when administered on separate occasions.

Reproducibility was evaluated in a group of 15 clinically stable MG patients (11 women; mean age 56.6 years; range 19–75 years). According to Osserman's classification, 2 patients were included in grade 1, 5 in grade 2a, 5 in grade 2b, 2 in grade 3, and 1 in grade 4. The patients repeated the MGQ after an average of two days. To reduce the memory effect, the retest version of the questionnaire differed from the first version in the order of the questions.

Responsiveness, or sensitivity, is the ability to detect clinical change. Ten patients (7 women; mean age 50.6 years; range 24–74 years) were evaluated at two phases of therapy. According to Osserman's classification, 1 patient was included in grade 1, 2 in grade 2a, 3 in grade 2b, 2 in grade 3, and 2 in grade 4. Of the 10 patients, 6 were evaluated at the first diagnosis and after they had started therapy, while 4 patients with a worsening state of MG were evaluated before and after therapy was intensified.

Statistical analyses

Statistical analysis was performed using the STAT-SOFT (OK, USA) package. Because ordinal and nominal scales (such as SF-36, Osserman's classification) were used for measurement, non-parametric analysis of the correlation was assessed by Spearman's rank correlation coefficient. Group comparisons were assessed by the Mann-Whitney *U* test.

Internal consistency was assessed by calculating the Cronbach coefficient alpha for the entire scale in the 41-patient cohort evaluated in stage II. An alpha of 1.0 represents perfect internal consistency, 0.9 is considered excellent, 0.8 is considered good, and 0.7 is considered acceptable [14, 15].

The reproducibility of the entire scale was assessed with the use of the Spearman-Brown test-retest reliability test. Correlation of the initial and retest scores of the MGQ was measured with Spearman's rank correlation coefficient and was used as an additional measure of reproducibility.

With regard to responsiveness to changes in therapy, MGQ scores were compared with the use of Wilcoxon's matched pairs test.

Results

Item generation

Items concerning the patient's activities during a typical day, problems with work, and perceptions of health were inspired by some SF-36 items. Some of the items concerning daily activities generated by clinicians were particularly focused on problems regarding the assumption of therapy, sporting activities, diet, disability at work, etc. MG patients generated items concerning difficulties in daily activities, some of which were particularly focused on ocular problems, autonomy, and working inability.

Items were grouped to eliminate those that were repetitive and a 56-item questionnaire was generated.

Item reduction

Those items which at correlation analysis were either poorly correlated or not correlated at all with Osserman's classification or the results of clinical examination were eliminated. These items concerned the patient's perception of health, the ability to shampoo hair, dyspnea, smiling, drinking, mastication, dependence on another person, etc. We included ocular items even if they were poorly related to Osserman's classification because this classification is expected to be poorly related with ocular symptoms (in fact grade I includes patients with ocular symptoms only and these symptoms may also be present in more severe conditions).

After item reduction, the final version of the MG questionnaire consisted of a 25-item scale (Fig. 1). The global score of the MGQ, obtained from the sum of the items, ranges from 0 for maximum impairment to 50 for absence of impairment. Correlations of the items of the final version of MGQ with the Osserman grade and findings at clinical examination are given in Table 2.

Validity and reliability testing

The internal consistency (measured with the Cronbach coefficient alpha) of the overall final questionnaire was excellent (0.95).

Reproducibility was very good. Measured with Spearman's rank correlation coefficient, the r value was 0.91; measured with Spearman-Brown test-retest analysis, the coefficient value was 0.94.

With regard to responsiveness, there was significant improvement in the scores obtained by patients having started or increased therapy and showing clinical improvement (mean global score before, 25.6 (SD=2.4); mean global score after starting or intensifying therapy, 21.9 (SD=3.1); p=0.005).

Discussion

Recently, the Task Force of the Medical Scientific Advisory Board of the Myasthenia Gravis Foundation of America performed a huge effort particularly focused on standardizing

Myasthenia Gravis Questionnaire (MGQ)

Istruzioni: Il presente questionario riguarda i Suoi sintomi e la Sua capacità di eseguire alcune attività. Per cortesia compili **ogni domanda** facendo riferimento alle Sue condizioni durante l'ultima settimana crociando la risposta appropriata.
Se non ha avuto l'opportunità di eseguire durante l'ultima settimana alcune attività proposte nelle domande, risponda **presupponendo come** avrebbe potuto eseguirle.

1. In generale, direbbe che la sua salute è:

(indichi una casella)

Eccellente ❑ Buona ❑ Scadente ❑

2. Le seguenti domande riguardano alcune attività che potrebbe svolgere nel corso di una qualsiasi giornata. La Sua salute La limita attualmente nello svolgimento di queste attività?

Se SÌ, fino a che punto?

(indichi per ogni domanda il numero 1, 2 o 3)

	Sì, mi limita parecchio	Sì, mi limita parzialmente	No, non mi limita per nulla
a) Attività di moderato impegno fisici, come spostare un tavolo, usare l'aspirapolvere, giocare a bocce o fare un giretto in bicicletta.	1	2	3
b) Sollevare o portare le borse della spesa.	1	2	3
c) Salire qualche piano di scale.	1	2	3
d) Salire un piano di scale.	1	2	3
e) Piegarsi, inginocchiarsi o chinarsi.	1	2	3
f) Camminare per qualche centinaia di metri.	1	2	3
g) Camminare per circa cento metri.	1	2	3
h) Farsi il bagno o vestirsi da soli.	1	2	3

3. Ha riscontrato i seguenti problemi sul lavoro o nelle altre attività quotidiane a causa della Sua salute fisica?

Risponda SÌ o NO a ciascuna domanda

(indichi per ogni domanda il numero 1 o 2)

	SÌ	NO
a) Ha ridotto il tempo dedicato al lavoro o ad altre attività?	1	2
b) Ha reso meno di quanto avrebbe voluto?	1	2
c) Ha dovuto limitare alcuni tipi di lavoro o altre attività?	1	2

Fig. 1 Final validated version of the myasthenia gravis questionnaire (MGQ), in Italian

Fig. 1 Cont.

4. Durante le ore serali avverte maggiore stanchezza?

(indichi una casella)

sì ❑ sì ma lieve ❑ no ❑

5. Riesce a svolgere le normali attività quotidiane?

sì ❑ sì ma con difficoltà ❑ no ❑

6. Riesce a lavare i denti?

sì ❑ sì ma con difficoltà ❑ no ❑

7. Riesce a parlare in maniera fluida per lungo tempo?

sì ❑ sì ma non sempre ❑ no ❑

8. Riesce a passare da accovacciato a seduto?

sì ❑ sì ma con difficoltà ❑ no ❑

9. Riesce ad alzarsi dalla sedia senza aiuto delle braccia?

sì ❑ sì ma con difficoltà ❑ no ❑

10. È in grado di portare valigie di medie dimensioni (10-20 kg)?

sì ❑ sì ma per poco ❑ no ❑

11. Riesce a guidare la macchina in un percorso cittadino?

sì ❑ sì ma per poco ❑ no ❑

12. Riesce a svolgere le mansioni domestiche (ad esempio rifare il letto, stirare, cucinare)?

sì ❑ sì ma per poco ❑ no ❑

13. Ha difficoltà a leggere o guardare la televisione a causa della visione doppia?

sì ❑ sì ma raramente ❑ no ❑

14. Ha difficoltà a leggere o guardare la televisione a causa dell'abbassamento delle palpebre?

sì ❑ sì ma raramente ❑ no ❑

15. Riesce a cantare? fischiare? gridare?

sì ❑ sì ma per poco ❑ no ❑

16. Ha ridotto il tempo trascorso con gli amici o la famiglia?

sì ❑ sì ma per poco ❑ no ❑

Table 2 Correlation between items of MGQ and findings at clinical examination and Osserman's classification

Item	Diplopia	Ptosis	Dysphagia	Dysarthria	Superior facial muscles	Inferior facial muscles	Neck flexion	Arm abduction	Abductor digiti minimi	Respiratory dyspnea	Mingazzini position	Osserman's grade
1. General health	ns	$p<0.02$	ns	ns	ns	ns	ns	$p=0.005$ r=0.4	ns	$p=0.02$	$p=0.004$ r=0.5	$p=0.0007$ r=- 0.5
2a. Moderate activity	ns	ns	$p<0.01$	ns	$p<0.02$ r=-0.4	$p=0.02$ r=-0.4	$p=0.001$ r=0.5	$p=0.000004$ r=0.6	ns	$p=0.02$	$p=0.0003$ r=0.5	$p=0.000001$ r=-0.7
2b.Grocery bags	ns	ns	$p<0.04$	$p<0.04$	$p<0.002$ r=-0.5	$p=0.01$ r=-0.4	$p=0.002$ r=0.5	$p=0.0001$ r=0.6	ns	$p=0.001$	$p=0.004$ r=0.4	$p=0.0003$ r=-0.5
2c. To go up several flights of stairs	ns	ns	$p<0.02$	ns	$p<0.008$ r=-0.4	$p=0.03$ r=-0.3	$p=0.001$ r=0.5	$p=0.0005$ r=0.5	ns	$p=0.0001$	$p=0.001$ r=0.5	$p=0.00004$ r=-0.6
2d. To go up one flight of stairs	ns	ns	ns	$p<0.04$	ns	$p=0.005$ r=-0.4	$p=0.002$ r=0.5	$p=0.005$ r=0.4	ns	$p=0.04$	$p=0.0003$ r=0.5	$p=0.001$ r=-0.5
2e. To bend one's knees	ns	ns	$p<0.01$	ns	$p<0.008$ r=-0.4	$p=0.03$ r=-0.3	$p=0.02$ r=0.4	$p=0.001$ r=0.5	ns	ns	$p=0.02$ r=0.4	$p=0.00004$ r=-0.6
2f. To walk several 100 m	ns	ns	$p<0.01$	$p<0.02$	ns	ns	$p=0.01$ r=0.4	$p=0.001$ r=0.5	ns	$p=0.006$	$p=0.02$ r=0.4	$p=0.0005$ r=-0.5
2g. To walk 100 m	ns	ns	$p<0.009$	ns	$p<0.005$ r=-0.4	$p=0.005$ r=-0.5	$p=0.003$ r=0.6	$p=0.02$ r=0.4	ns	$p=0.02$	ns	$p=0.0007$ r=-0.5
2h. To take a bath, to dress	ns	ns	$p<0.01$	ns	ns	ns	$p=0.04$ r=0.3	$p=0.007$ r=0.4	ns	ns	$p=0.01$ r=0.4	$p=0.0005$ r=-0.5
3a. To work, time	ns	ns	$p<0.01$	ns	$p<0.003$ r=-0.5	$p=0.04$ r=-0.3	$p=0.0003$ r=0.6	$p=0.000003$ r=0.7	ns	$p=0.006$	$p=0.002$ r=0.5	$p=0.000001$ r=-0.7
3b.To work, performance	ns	ns	$p<0.008$	ns	ns	ns	$p=0.005$ r=0.5	$p=0.00005$ r=0.6	ns	$p=0.02$	ns	$p=0.0008$ r=-0.5
3c. To work, limitations	ns	ns	$p<0.03$	ns	$p<0.009$ r=-0.4	ns	$p=0.01$ r=0.4	$p=0.001$ r=0.5	ns	ns	ns	$p=0.002$ r=-0.5
4. Evening weakness	ns	$p<0.005$	ns	ns	ns	ns	ns	ns	ns	ns	$p=0.006$ r=0.4	$p=0.006$ r=-0.4
5. Normal activity	ns	ns	$p<0.003$	$p<0.04$	$p<0.01$ r=-0.4	ns	$p=0.00003$ r=0.6	$p=0.0000002$ r=0.7	ns	$p=0.01$	$p=0.001$ r=0.5	$p=0.000000007$ r=-0.8
6. To brush teeth	ns	ns	ns	ns	$p<0.004$ r=-0.5	$p=0.0008$ r=-0.5	ns	ns	ns	ns	$p=0.01$ r=0.5	$p=0.003$ r=-0.5

Table 2 Cont.

Item	Diplopia	Ptosis	Dysphagia	Dysarthria	Superior facial muscles	Inferior facial muscles	Neck flexion	Arm abduction	Abductor digiti minimi	Respiratory dyspnea	Mingazzini position	Osserman's grade
7. To speak	ns	ns	ns	p =0.02	p =0.004 r=-0.4	p =0.03 r=-0.3	ns	ns	ns	p =0.03	ns	p =0.003 r=-0.5
8. To stand up	ns	ns	ns	ns	p =0.02 r=-0.4	ns	p =0.04 r=0.3	p =0.003 r=0.5	ns	p =0.04	p =0.02 r=0.4	p =0.001 r=-0.5
9. To get up out of chair	ns	ns	p =0.008	p =0.04	p =0.04 r=-0.3	p =0.02 r=-0.4	p =0.004 r=0.5	p =0.0005 r=0.5	ns	ns	p =0.007 r=0.4	p =0.0002 r=-0.6
10. To carry a heavy case	ns	ns	p =0.04	ns	ns	ns	ns	p =0.04 r=0.3	ns	p =0.008	ns	p =0.004 r=-0.4
11. To drive car	ns	ns	p =0.03	ns	p =0.02 r=-0.4	p =0.04 r=-0.4	p =0.004 r=0.5	p =0.03 r=0.4	ns	ns	p =0.004 r=0.5	p =0.009 r=-0.4
12. Activity at home	ns	ns	p =0.02	ns	p =0.01 r=-0.4	p =0.3 r=-0.3	p =0.001 r=0.5	p =0.00003 r=0.6	ns	ns	p =0.00002 r=0.6	p =0.0002 r=-0.6
13. To read-watch TV 1	p =0.04	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
14. To read-watch TV 2	ns	p =0.02	ns	ns	ns	ns	ns	ns	ns	ns	ns	p =0.02 r=-0.4
15. To sing	ns	ns	ns	ns	p =0.02 r=-0.4	p =0.04 r=-0.3	p =0.003 r=0.5	p =0.006 r=0.4	ns	ns	p =0.00006 r=0.6	p =0.0006 r=-0.5
16. Time for friends	ns	ns	ns	ns	p =0.0004 r=-0.5	p =0.006 r=-0.4	p =0.00004 r=0.6	p =0.0001 r=0.6	ns	p =0.001	p =0.005 r=0.5	p =0.00003 r=-0.6
Global score	ns	ns	p =0.0008	p <0.03	p =0.001 r=-0.5	p =0.03 r=-0.3	p =0.0001 r=0.6	p =0.000002 r=0.7	ns	p =0.001	p =0.0004 r=0.5	p =0.0000001 r=-0.7

ns, not significant

therapeutic research trials [2]. The use of outcome research methods, including quality of life assessment, and the development of disease-specific questionnaires were suggested.

Two previous studies [6, 7] have assessed HRQoL in MG patients using a generic HRQoL tool (SF-36) because a disease-specific questionnaire was not available. Unexpectedly, bulbar impairment was not related to a deterioration of HRQoL. Although SF-36 is a good tool to assess general HRQoL, it does not have high responsiveness for focal impairments such as those suffered by patients with ocular-facial forms of MG. Thus, both studies confirmed the need for a disease-specific questionnaire to provide more specific outcome measurements.

Here we have described the development and validation of a disease-specific questionnaire for MG. The questionnaire provides a measure of functional status and not of the mental picture (disease-specific measurements are not necessary for mental assessment).

The current study was performed in agreement with the recommendations proposed by the Task Force of the Medical Scientific Advisory Board of the Myasthenia Gravis Foundation of America.

We followed internationally accepted rules for the development of a self-administered questionnaire [9, 14–18]. The different stages of the development allowed us to generate a self-administered questionnaire which assesses the functional status of daily activity.

Field testing (prospective multidimensional study on 41 MG patients) showed that results of the final version of the questionnaire (25-item scale) were closely related to most findings at clinical examination. Single items concerning daily activity which involve global motor function and the global MGQ score were strongly related to the strength of proximal muscles (Fig. 2). Even the items concerning working activity were related to findings at clinical examination for the proximal muscles. Clinically assessed bulbar innervated muscle function was strongly related to many items, particularly those connected to speaking or singing. Ocular symptoms correlated only to two items concerning the activity of watching.

In a further phase, if subscore-domains are developed, we will be able to evaluate if the items are sufficient to measure the impairment in patients with ocular myasthenia gravis; otherwise we will have to increase the number of the items concerning these ocular symptoms.

All but one of the 25 items (watching limitations due to diplopia) and the global MGQ score were strongly related to the Osserman grade (Figs. 3, 4). In fact, diplopia for the construction of the Osserman classification is not theoretically related with the scale (the first class includes pure ocular forms).

The MGQ had excellent internal consistency, with a Cronbach alpha of 0.95. Similarly, the reproducibility of the questionnaire was very good. In the present study, the test-retest interval was relatively short (an average of two days) in order to limit the possibility of true clinical change falsely reducing the measure of reproducibility, as MG is a disease with frequent marked fluctuations. However, as this could also increase the chance of memory effect, thus falsely improving the measured reproducibility of the questionnaire, the order of the questions was different in the retest version of the questionnaire.

In conclusion the MG questionnaire we have developed provides a reliable and valid perspective measure of the functional status of the daily activity of myasthenic patients. Further studies are needed to evaluate the possibility of aggregating of the items into subscales. Furthermore, although the studied sample is quite wide for this pathology (MG is rare), the questionnaire should be evaluated in a wider and possibly multicentric sample.

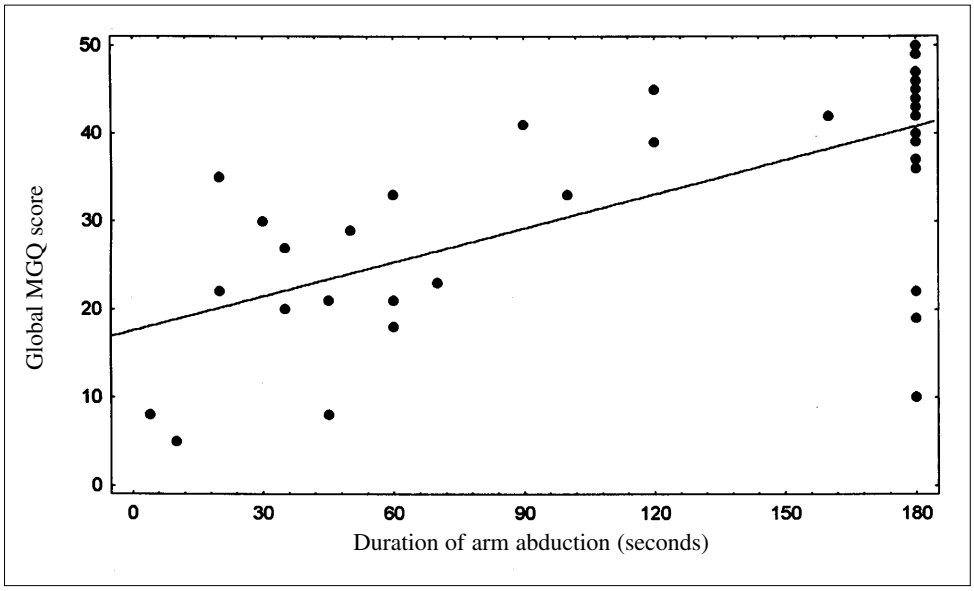

Fig. 2 Correlation between duration of arm abduction and global score on myasthenia gravis questionnaire (MGQ). p=0.000002, r=0.7

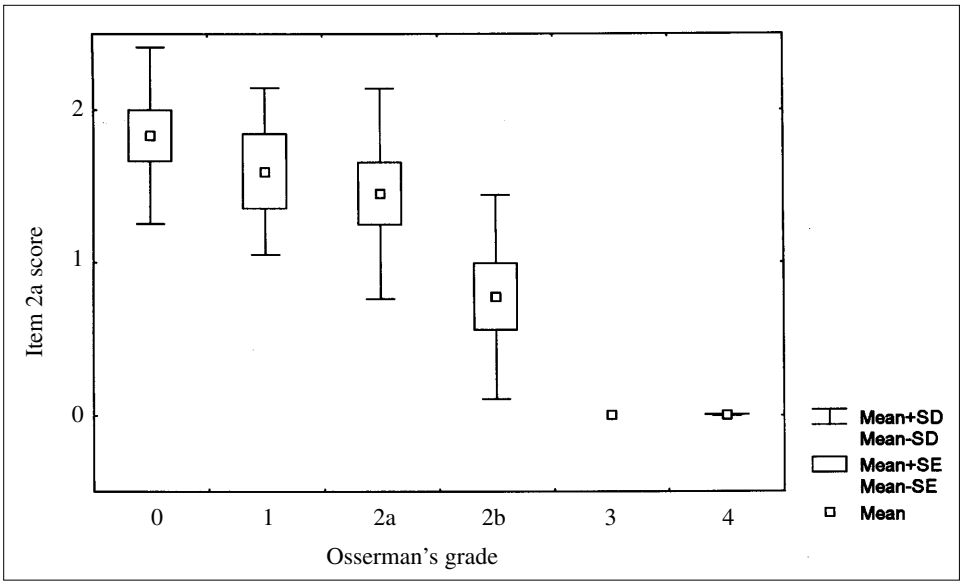

Fig. 3 Relationship between Osserman's grade and score on item 2a of the MGQ (p=0.000001, r=-0.7)

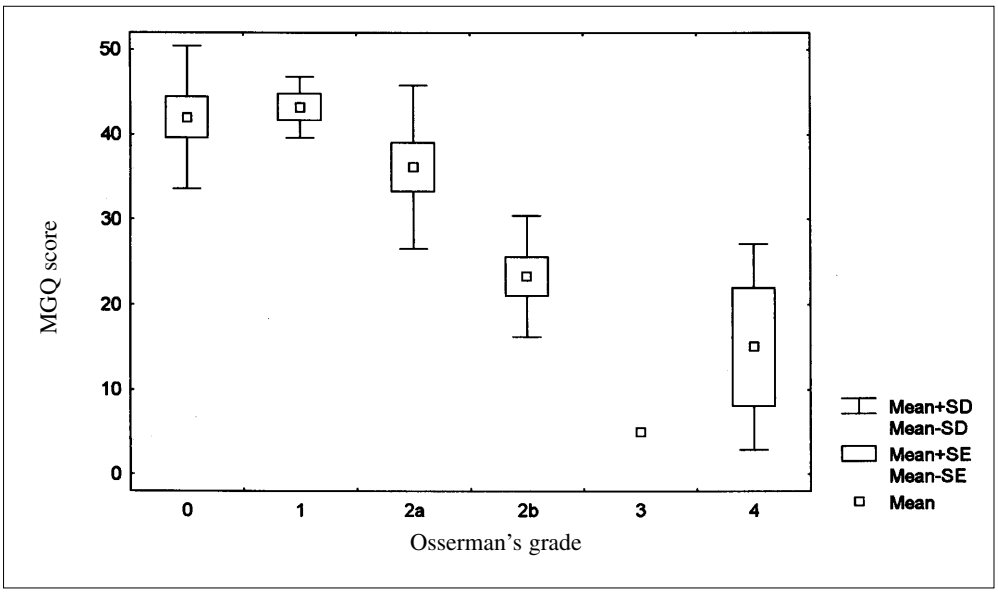

Fig. 4 Relationship between Osserman's grade and global score on the myasthenia gravis questionnaire (p=0.000001, r=-0.7)

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Sommario Obiettivo. *Descrivere lo sviluppo e la validazione di un questionario* patient-oriented *specifico per la miastenia gravis (MG) e correlarne gli item con le misurazioni convenzionali della MG.* Materiali e metodi. *Sono stati studiati 41 pazienti tra ricoverati e non (età media 56.7, range 19–86, 19 maschi, 22 femmine). Nella fase I, generazione degli item, un gruppo di esperti clinici e di metodologi ha stilato una lista di 56 item. La lista era basata su: (1) un precedente studio su un campione di pazienti MG, (2) sull'esperienza clinica di un gruppo di esperti, (3) su item proposti da pazienti MG. Nella fase 2, riduzione degli item, la lista è stata ridotta in base ai risultati di uno studio pilota (41 pazienti hanno compilato il questionario con 56 item), ottenendo così un questionario con 25 item (MGQ). Nella fase 3, sono stati valutati l'affidabilità e la validità.* Risultati. *Il punteggio del MGQ è correlato con le misure convenzionali di gravità della MG. Il questionario MGQ si è dimostrato affidabile, sensibile e riproducibile: (1) la consistenza interna (misurata con il Cronbach coefficient alpha) del questionario finale è risultata eccellente: 0.95; (2) la riproducibilità è risultata molto buona, (Spaerman rank correlation coefficient r: 0.91, Spearman-Brown test-retest analysis, coefficient value: 0.94); riguardo la responsabilità, si è osservato un significativo miglioramento del punteggio in pazienti che, dopo aver cominciato la terapia, o incrementato i dosaggi, presentavano un miglioramento clinico (p=0.005).* Discussione. *Il questionario da noi sviluppato si è dimostrato uno strumento di*

misura dello stato funzionale dei pazienti miastenici affidabile e valido. Recentemente, la Task Force of the Medical Scientific Advisory Board of the MG Foundation plan of America ha suggerito di introdurre nei trial di ricerca sulla MG l'uso di strumenti di misurazione della vita, nonché di sviluppare un questionario di patologia specifico, con cui valutare l'outcome nella MG. Il MGQ, come misura di outcome validata, potrebbe essere usato nella clinica e nell'attività di ricerca inerente la MG.

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