International Journal of Psychology and Psychological Therapy, 14, 1, 105-113, 2014

Anxiety, Depression and Self-Efficacy in Patients with Myasthenia Gravis

Pamela Parada*, Mireia Oliva, Esther Lázaro, Imanol Amayra, Juan Francisco López Paz, Oscar Martínez, Amaia Jometón, Sarah Berrocoso, Andrea Iglesias, Manuel Pérez

Universidad de Deusto, España

José Eulalio Bárcena

Hospital Universitario de Cruces, Barakaldo, España

Abstract

Myasthenia is an autoimmune disease of neuromuscular transmission. This disease is typically characterised by muscle weakness, which is exacerbated by the performance of certain activities or exercise; patients usually recover with rest. Some studies have noted that people with myasthenia gravis have significantly higher depression scores than control participants. Extended experience with neuromuscular disease symptoms has been correlated with mood disorder symptoms. The present study measured and compared the presence of depression, anxiety and self-efficacy as well as the relationships among these variables in people with myasthenia gravis. An evaluation scale for this disease was specifically adapted. A total of 52 participants with myasthenia gravis were given two tests: the HAD questionnaire, which measures depression, and the general self-efficacy questionnaire (GSE). This study found a significantly correlation between anxiety and depression in people with myasthenia gravis. A correlation between self-efficacy and depression was also observed.
Key words: myasthenia gravis; depression; anxiety; self-efficacy.

Novelty and Significance

What is already known about the topic?

There are few studies analyzing quality of life and psychosocial functioning of patients with Myasthenia Gravis (MG).

These studies suggest that people with MG are more likely to have mood disorders.

What this paper adds?

The present study analyses the relation between depression, anxiety and self-efficacy, and reveals higher levels of distress, anxiety and depression in patients with MG compared to healthy controls. Self-efficacy negatively correlates with these variables.

These conclusions could provide an opportunity to deeply study the relation between these variables.

Myasthenia gravis is an autoimmune disease of neuromuscular transmission. This disease is typically characterised by muscle weakness, which is exacerbated by the performance of certain activities and exercises. Patients usually recover with rest (Donald, Sanders, & Howard, 1991). This disease causes patients to become progressively weaker, and improvements tend to be transient (Paul, Cohen, Goldstein, & Gilchrist, 2000b).

* Correspondence author: Pamela Parada Fernández, Grupo de Investigación Neuro-e-motion, Facultad de Psicología y Educación, Universidad de Deusto, Avda. Universidades 24, 48007 Bilbao, España. Email: pamela.parada@deusto.es.

This autoimmune condition and its symptoms are closely linked to acetylcholine receptor (AChR) antibodies (Chienza, Fleming, Parry, & Skelton, 2010). The observed spontaneous remissions related to this disease are truly strange, and the records of these phenomena are rarely discussed (Martín, 2010). Myasthenia gravis is considered a rare disease given its low worldwide incidence. As Phillips (1994) indicated, its prevalence is approximately 12.5 cases per 100,000 people. Different ethnicities and races are similarly affected. This condition can appear at any time during the life cycle. Other related studies, such as García, Villalobos, and Rodríguez (2011), have noted that Spain reports approximately 21 cases per 1,000,000 people.

In addition, this disease typically manifests itself in women in their second or third decade of life; however, it commonly occurs among men during their fifth or sixth decade of life (García, Villalobos, & Rodríguez, 2011; Pallaver, Riviera, Piffer, *et al*., 2010).

Fluctuating muscle weakness is the primary clinical symptom of this disease. Specifically, the loss of muscle tonicity in the eyes is the most common weakness in people with myasthenia gravis (Thomann & Pandya, 1995). García, Villalobos, and Rodríguez (2011) indicated that 50% of people with myasthenia suffer from ocular weakness, 25% manifest diplopia at the onset of the disease, and 25% manifest ptosis. A generalised weakness appears as the disease progresses. Moreover, weakness is manifested in the extremities; dysgraphia and dysarthria are also present, which make performing tasks difficult. The chance of respiratory failure is relatively low but has occurred in some cases (Muñoz, Díez, Frank, Pino, Pérez, & Barreiro, 2004).

The clinical features of myasthenia gravis affect different aspects of patients' lives (e.g., familial, social, professional and personal) (Castro, Guarantini, Batista-Neves, Kraychete, & Miranda-Scippa, 2006). Importantly, as with many chronic diseases, myasthenia gravis is associated with a significant prevalence of depression and anxiety symptoms, primarily due to the characteristics of the disease, its unpredictable progression and its influence on patients' various subsystems (Ybarra, Kummer, Comini, Oliveira, Gómez, & Texeira, 2011). Lazarus and Folkman (1984) studied a recognition of emotional facial expressions and their relationship with mood disorders. They observed evidence that emotional recognition difficulties are related with depression in Myasthenia Gravis Others difficulties are associate with facial recognition problems (Lázaro, Amayra, López Paz, Jometón, Pérez, & Oliva, 2011).

Ochs, Bradley, Katholi, *et al*. (1998) indicated that people with myasthenia gravis have significantly higher depression scores compared with control participants. The results of another study suggested that neuromuscular diseases are significantly associated with symptoms and signs of mood disorders (Robert, Ronal, Jonathan, & James, 2000).

People with myasthenia gravis might have a higher risk of manifesting psychiatric disorders. In fact, researchers have found a higher prevalence of mood and anxiety disorders in people with this condition compared with the general population (Ybarra *et al*., 2011).

Sitek, Bilinska, Wieczorek, and Nyka (2009) found that patients with myasthenia gravis had higher scores on the Beck Depression Inventory compared with a control group (Ybarra *et al*., 2011). Other researchers have confirmed these findings. Importantly,

the presence of depression should not be confused with the characteristics of myasthenia gravis, such as muscle weakness, confusion or apathy (Paul, Cohen, Golsdtein, & Gilchrist, 2000b).

The present study measured and compared the presence of depression, anxiety and self-efficacy in people with myasthenia gravis using an evaluation scale specifically adapted for this population that was validated with patients and the general population.

Method

Participants

Sample was made up of 52 participants over 18 years old who were diagnosed with myasthenia gravis. Sample distribution by gender and age, marital status, education level, job situation are showed in Table 1.

The participants in this study (*n*= 52) were between 19 and 80 years old, with an average age of 54.31 and a standard deviation 15.203. With regard to gender, 29 of the participants were (55.8% of the sample) and 23 were male (44.2%). Thus, the sample was homogeneous with respect to gender. Most of the participants were married, fewer were single and even fewer were separated (see Table 1).

With regard to education level (see Table 1), most of the participants had completed their basic general education (EGB), followed by people with a bachelor's degree and

Table 1. Sample distribution by gender and age, marital status, education level and job situation.

		n	Average	*SD*	Frecuencies	Percentages
Women		29				
Men		23				
Total		52				
Age	Women age		49.90	15.412		
	Man age		59.87	13.247		
Marital status	Married				38	73.1%
	Living with partner				1	1.9%
	Divorcied				3	5.8%
	Separated				1	1.9%
	Single				7	13.5%
	Widower				2	3.8%
	Total				52	100%
Academic Nevel	Secondary Education				20	38.55%
	Sixt form				9	17.3%
	Mentoring training course				8	15.4%
	University studies				5	9.6%
	Degree				10	19.2%
	Total				52	100%
Employment status	Employee				13	25%
	Autonomous				2	3.8%
	Unpaid work				1	1.9%
	Unemployed				4	7.7%
	Retirees				16	30.8%
	Housework				5	9.6%
	Student				2	3.8%
	Disabled				7	13.5%
	Others				2	3.8%
	Total				52	100%

FP2. In addition, the labour situation shown in Table 4 indicates that the majority of participants were retired. However, many participants remained active across different work situations as employees, students or homemakers.

The average participant age at myasthenia gravis diagnosis was 46.94 years with a standard deviation of 17.676; these data ranged from 14 to 76 years. Moreover, participants with myasthenia gravis had lived with the disease for 7.35 years, half of whom were 35 years or younger, with a standard deviation of 8.774.

Recruitment occurred at public institutions such as Cruces Hospital and Basurto Hospital as well as at neuromuscular disease associations in Basque Country, such as AMES (Asociación de Miastenia de España) and BENE (Bizkaiko Eritasun Neuromuskularren Elkartea). The exclusion criteria included severe psychiatric illnesses (e.g., psychosis), sensory problems or issues that prevented patients from handling tools. The inclusion criteria included a diagnosis of myasthenia conducted by clinicians, an age over 18 years and a signed informed consent form. All participants voluntarily signed an informed consent form that explained the study and the necessary measures regarding their anonymity.

Instruments

The *Hospital Anxiety and Depression scale* (HAD; Zigmond & Snaith, 1983). The purpose of the HAD is to assess the anxiety and depression responses in people with physical and mental disorders as well as the general population. This scale consists of 14 items with four Likert response options and provides separate scores using two subscales: anxiety and depression. The items measure cognitive, emotional and behavioural responses of anxiety and depression. This scale was chosen because the items do not include somatic components, which reduces the possibility of false positives that might exist when the HAD is applied to patients with physical symptoms. López-Roig, Terol, Pastor, *et al*. (2000) adapted this evaluation into Spanish. the scores of 0-7 are considered normal scores of 8-10 is considered risk scores and scores of 11-21 indicate cases of anxiety or depression. The psychometric data of the Spanish adaptation show that the measures of anxiety and depression have internal consistencies of 0.85 and 0.87, respectively. The test-retest correlation was significant at the $p \leq 0.01$ level and obtained reliabilities of 0.65 and 0.64 for anxiety and depression, respectively.

The *General Self-Efficacy Scale* (GSE; Baessler & Schwarcer, 1996). The GSE is comprised of 10 items that assess general self-perceptions related to personal competence with regard to dealing with stressful daily life events. The Spanish adaptation of this scale includes the following psychometric data: internal consistency/reliability= 0.87 and split-half correlation= 0.88 (Sanjuán, Pérez, & Bermúdez, 2000).

Procedure

First, the sample recruitment process via public institutions and associations was explained in the paragraph concerning the participants. Once the sample was recruited, the participants were contacted to schedule an appointment for the assessment session.

This meeting occurred at the University of Deusto or at public centres or associations to provide the participant with access.

The procedure was explained to the participants during the evaluation session, and they signed the informed consent form prior to evaluation. Psychologists who had experience with people with rare diseases conducted all evaluations. The protocol lasted 45 minutes. After an initial interview, the participants completed two self-administered questionnaires in the following order: the GSE (Sanjuán *et al*., 2000) and the HAD scale (Zigmond & Snaith, 1983).

Data analyses

The assessment results of the 52 participants diagnosed with myasthenia gravis are discussed below. The analyses of the clinical and demographic variables were conducted using SPSS Version 20.0 by obtaining descriptive statistics for the quantitative variables (i.e., median, mean and standard deviation) and the frequency and percentages for nominal/categorical variables.

We used the Kolmogorov-Smirnov test to verify that the data were normally distributed (p >05). The data analyses employed the nonparametric Mann-Whitney U test to compare our sample with a nonparametric distribution. Furthermore, we used Spearman's correlation coefficient for quantitative and ordinal variables. For all accepted hypothesis tests, a p-value less than or equal to 0.05 with 95% confidence intervals was considered significant.

Results

The HAD (Zigmond & Snaith, 1983) was used to measure the level of stress and anxiety across two subscales of people: those with physical or mental diseases and the general population. In this sample, the average depression score was 3.29. The maximum score was 15 and standard deviation (SD) 3872. Moreover, the average anxiety subscale score was 5.65 and SD 5201.

The GSE (Sanjuan, Pérez, & Bermúdez, 2000) provided an average score of 32. 346 and standard deviation of 5.82, with a range between 13 and 40. We compared gender differences for the HAD and GSE scores. Women showed significantly higher rates of depression (U = 226.5, z= -2.003, p <.0.5, r= -0.37) and anxiety (U=187.5 z= -2.706, p <.0.5, r= -0.27) compared with men. Conversely, between-gender differences

Table 2. Description of GSE and HAD scores by sex.

Sex	*n*	Depression		Anxiety		Efficacy	
		Average	*SD*	Average	*SD*	Average	*SD*
Female	29	7.14	5.215	4.17	4.080	31.27	5.43
Male	23	2.17	3.35	3.78	4.64	33.21	6.20

Table 3. Correlations among different variables.

		Age at diagnosis	Years of desease	Anxiety	Deppresion	Self-Efficacy
Age at diagnosis	Spearman Correlation	1	-.490**	-.542**	-.222	.067
	Sig. (bilateral)		.000	.000	.125	.647
Years of desease	Spearman Correlation	-.490**	1	.159	-.077	.008
	Sig. (bilateral)	.000		.276	.598	.959
Anxiety	Spearman Correlation	-.542**	.159	1	.654**	-.477**
	Sig. (bilateral)	.000	.276		.000	.000
Depression	Spearman Correlation	-.222	-.077	.654**	1	-.480**
	Sig. (bilateral)	.125	.598	.000		.000
Efficacy	Spearman Correlation	.067	.008	-.477**	-.480**	1
	Sig. (bilateral)	.647	.959	.000	.000	

Notes: n= 52; **= Correlation is significant at the 0.01 level (bilateral).

were not found with regard to GSE scores (U= 251.5, z= -1.514, p <.0.5, r= -0.20) (see Table 2).

Table 3 presents a correlational analysis of the variables studied. A significant positive relationship was found between participant anxiety and depression scores regardless of gender: as anxiety scores increased, depression scores did the same. Furthermore, a negative correlation was found between anxiety and efficacy: higher anxiety scores denoted lower GSE scores. The same was true for depression and efficacy.

A negative correlation was also found between age at diagnosis and anxiety: lower anxiety levels were found among participants who were older at diagnosis. Conversely, a significant correlation was not found between depression and age at diagnosis.

Discussion

This study did not reveal high levels of depression or anxiety. This result does not match those of the Leppänen study or Milders, Bell, Terriere, and Hietanen (2004), both of which reported high indices of depression and anxiety. This discrepancy might be due to the technique previous studies used to collect data, which is often inappropriate and generates false positives. This study used the HAD scale, which accounts for somatic and vegetative indicators: for example, "Do you feel that you are tired most of the time?" This was not the case for Leppänen, Milders, Bell, *et al*. (2004). These indicators are important to measure because these patients suffer from fatigue and a lack of muscle tone.

Paul, Cohen, Gilchrist, and Golsdtein (2000a) indicated that some studies of patients with myasthenia gravis have used inadequate questionnaires (e.g., the Beck or Hamilton depression assessments) because they did not provide for the possibility that symptoms of the disease might be confused with depressive symptoms.

Moreira *et al*. (2006) sought to validate the HAD scale in patients with chronic pain. Although this scale is effective in assessing symptoms of anxiety and depression, it is not valid for diagnosis. This instrument has shown a strong ability to identify individuals who are anxious and/or depressed well as mild forms of psychiatric disorders (Herrmann, 1997; Calle, Simoes, De Figueiredo, & Muriano, 2011).

This study revealed significant gender differences with regard to anxiety and depression: women with myasthenia scored higher on scales of these two variables than men. This finding matches that of Leppänen *et al*. (2004), who suggested that women who suffer from some form of chronic disease are more likely to report depression. Gender differences exist with regard to mental illness (Paul *et al*., 2000b). Women seem to have more risk factors for depression than men. Other researchers, including Baral (2007), have confirmed the above points regarding chronic diseases such as myasthenia gravis: psychiatric psychopathology manifest as anxiety disorders and depressive disorders (Stewart, Robertson, Johnson, & Howard, 2007).

Furthermore, the HAD was used to identify women with higher anxiety in a Spanish population (Terol, López Roig, Rodríguez Marín, *et al*., 2007). Terol et al.,(2007) think that the greater anxiety observed in women is associated with the cognitive symptoms defined in the HAD, whereas men better identify with the physiological component of anxiety, which is more measurable in the ISRA.

The HAD was used to measure anxiety and depression in patients with cancer. This study found that these patients had a higher prevalence of anxiety and depression. Furthermore, women's depression scores were much higher than those of men (López Roig *et al*., 2000). Paul *et al*. (2000a, b) reported that people with myasthenia gravis often delay seeking primary care because the symptoms can overlap with psychiatric symptoms and therefore remain unrecognised. Therefore, it is important for care providers to be able to effectively diagnose myasthenia gravis in the presence of these psychiatric symptoms.

Significant gender differences were not found with regard to self-efficacy. Importantly, however, we found a negative correlation between anxiety and self-efficacy. Lazarus and Folkman (1984) defined stress as the result of an imbalance between demands and personal resources in the person-environment relationship. In other words, a person perceives a situation as stressful when the resources needed to address the situation are inadequate or insufficient. Coping includes the actions that change or resolve the situation or manage the emotional responses associated with stress.

This study founds a positive correlation between anxiety and depression. A relationship between these two conditions would lead to more depression and greater levels of anxiety among patients with myasthenia gravis. A negative correlation between age at diagnosis and anxiety revealed that participants who were older at diagnosis had lower anxiety levels. Conversely, a significant correlation was not observed between depression and age at diagnosis. Thus, older participants might have more resources to deal with the adverse situations that arise throughout the lifespan.

Among the constraints that we encountered during the implementation of this study, we highlight the disadvantages of conducting a study of patients with rare diseases. Furthermore, geographic dispersion difficulties exist due to the low prevalence of such diseases. Moreover, the limited mobility of patients creates problems of access to a broad study population. As this study revealed, little information exists with which to properly evaluate populations such as those with myasthenia gravis. Future research should create assessment tools that are suited to the needs and characteristics of the patients with this specific disease (Lázaro *et al*., 2013).

References

Baral I (2007). Mood an anxiety disorders in patients with myasthenia gravis: Etiology, diagnosis and treatment. *CNS Drugs, 21,* 473- 481.

Baessler J & Schwarcer R (1996). Evaluación de la autoeficacia: Adaptación española de la escala de Autoeficacia General. *Ansiedad y Estrés, 2*, 1-8.

Calle A, Simoes M, De Figueiredo G, & Muriano G (2011). Myasthenia gravis. Two cose reports and review of literatura. *Brazilian Journal of Anesthesiology, 61,* 748-763. doi 10.1016/S0034-7094(11)70084-8.

Castro MMV, Guarantini L, Batista-Neves S, Kraychete DC, & Miranda-Scippa A (2006). Validez de la Escala Hospitalaria de Ansiedad y Depresión en Pacientes con Dolor Crónico. *Revista Brasileira de Anestesiología, 56*, 314-318.

Chienza J, Fleming I, Parry N, & Skelton V (2010). Maternal myasthenia gravis, complicated by fetal artrogryposis multiplex congenital. *International Journal of Obstetric Anesthesia, 20,* 79-82.

Donald B, Sanders, F, & Howard J (1991). Disorders of neuromuscular transmission. *Neurology in Clinical Practice, 2*, 2441-2461.

García T, Villalobos J, & Rodríguez H (2011). Miastenia gravis: caso clínico y revisión de la bibliografía. [Myasthenia gravis: case report and review of the literature.]. *Medicina Interna de México, 27,* 299-309.

Herrmann C (1997). International Experiences with the Hospital Anxiety and Depression Scale-A Review of Validation Data and Clinical Results. *Journal of Psychosomatic Research, 1*, 42, 17-41.

Lázaro E, Amayra I, López Paz J, Martín N, Caballero P, De Nicolás L, Hoffman H, Kessler H, Ruiz B, & Martínez O (2011). Facial affect recognition in myasthenia gravis *Neuromuscular Disorders*. *21,* 639-751.

Lázaro E, Amayra I, López Paz, JF, Jometón A, Pérez M, & Oliva M (2013). *E-motion1.0: a Virtual Serious Game to assess Theory of Mind in children*. IADIS International Conference e-Society 2013.

Lazarus RS & Folkman S (1984). *Strees, Appraisal and Coping*. New York: Springer.

Leppänen JM, Milders M, Bell JS, Terriere E, & Hietanen JK (2004). Depression biases the recognition of emotionally neutral faces. *Psychiatry Research, 128*, 123-133.

López Roig S, Terol MC, Pastor MA, Neipp MC, Massutí B, Rodríguez Marín J, Leyda JI, Martín Aragón M, & Sitges E (2000). Ansiedad y Depresión. Validación de la escala HAD en pacientes oncológicos. *Revista de Psicología de la Salud, 12*, 127-155.

Martín N (2010). *Programa online de mejora de habilidades sociales y emocionales para personas diagnosticas de miastenia gravis*. Tesis doctoral no publicada. Universidad de Valladolid. Valladolid, España.

Moreira M, Lucas Q, Batista Neves S, Campos K, Daltro C, & Miranda Scippa A (2006). Validez de la escala hospitalaria de ansiedad y depresión en pacientes con dolor crónico. *Revista Brasileira de Anesteiología,56*, 314-318.

Muñoz C, Díez E, Frank A, Pino J, Pérez C, & Barreiro P (2004). Evaluation of maximal respiratory pressures in myasthenia gravis. *European Neurology, 52,* 136-140. doi: 10.1159/000081464

Ochs C, Bradley R, Katholi C, Byl N, Brown V, Jones L, & Shohet J (1998). Symptoms of patients with myasthenia gravis receiving treatment. *Journal Medical, 29*, 1-12.

Pallaver F, Riviera A, Piffer S, Ricciardi R, Roni R, Orrico D, & Bonifati D (2010). Change in myasthenia gravis epidemiology in Trento, Italy, after twenty years. *Neuroepidemiology, 36,* 282- 287. doi:10.1159/000328863

Paul R, Cohen R, Gilchrist J, & Goldstein J (2000a). Fatigue and its impact on patients with myasthenia gravis. *Muscle and Nerve, 23*, 1402-1406.

Paul R, Cohen R, Golsdtein J, & Gilchrist J (2000b). Severity of mood, self- evaluative, and vegetative symptoms of depression in myasthenia gravis. *Journal Neuropsychiatry Clinical Neuroscience, 12*, 499-501.

Phillips L (1994). The epidemiology of myasthenia gravis. *Neurology Clinics of North America, 2*, 263- 271.

Robert H, Ronal A, Jonathan M, & James M (2000). Evaluative and vegetative symptoms of depression in myasthenia gravis. *The Journal of neuropsychiatry and clinical neurosciences, 12,* 499-501.

Sanjuán P, Pérez AM, & Bermúdez J (2000). Escala de autoeficacia general: Datos psicométricos de la adaptación para población española. *Psichothema*, *12*, 509-513.

Sitek E, Bilinska M, Wieczorek D, & Nyka W (2009). Neuropsychological assessment in myasthenia gravis. *Neurological Science, 30,* 9- 14. doi: 10.1007/s10072-008-0001-y.

Stewart S, Robertson K, Johnson K, & Howard J (2007). The prevalence of depression in myasthenia gravis. *Journal Clinical Neuromuscular Disorder, 8,* 111-115. d*oi:* 10.1007/s10072-008-0001-y.

Terol MC, López Roig S, Rodríguez Marín J, Martín Aragón M, Pastor MA, & Reig MT (2007). Propiedades psicométricas de la Escala hospitalaria de Ansiedad y Depresión (HAD) en población española. *Ansiedad y Estrés, 13*, 163-176.

Thomann K & Pandya S (1995). Myasthenia grave: pathophysiology, diagnosis, differential diagnosis and management. *Clinical Eye and Vision Care, 7*, 3-13.

Ybarra M, Kummer A, Comini E, Oliveira J, Gómez R, & Texeira A (2011). Psychiatric Disorders in myasthenia gravis. *Arquivos de Neuropsiquiatría, 69*, 176- 179. doi:10.1590/S0004-282X2011000200006g.

Zigmond AS, & Snaith RP (1983). The Hospital Anxiety and Depression scale. *Acta Psiquiatrica Scandinavica*, *67*, 361-370. doi: 04-282X2011000200006..

Received, October 17, 2013
Final Acceptance, Januay 20, 2014