



## Research Article

### Psychopathology, Psychosocial Factors and Quality of Life in Patients with Myasthenia Gravis

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**Introduction:** Myasthenia Gravis (MG) is a chronic disease which affects physical, psychological and social functioning of patients. In this study we aim to determine psychiatric comorbidity, some psychosocial factors and their relations with quality of life in patients with MG.

**Methods:** A total of 52 patients underwent psychiatric examination and the following scales were applied: Socio-demographic data form, Hospital Anxiety and Depression Scale (HADS), Quality of Life (QOL) Scale Short Form 36 (SF-36), Psychosocial Adjustment to Illness Scale-Self report (PAIS-SR), Multidimensional Scale of Perceived Social Support (MSPSS) and Posttraumatic Growth Inventory (PTGI).

**Results:** Among 52 patients with MG, 36.5% (n=19) had no psychiatric diagnosis; 21.2% (n=11) had adjustment disorder; 19.2% (n=10) had depression and 23.1% (n=12) had anxiety disorder. Patients with a psychiatric diagnosis had lower scores in general health, vitality, social functioning, emotional role and mental health domains of SF-36. PAIS-SR scores, total MSPSS and friends scores were significantly higher in patients without a psychiatric diagnosis. Significant correlations of psychosocial factors with quality of life were determined.

**Conclusion:** In MG patients, there is a high prevalence of psychopathology and it is associated with quality of life, perceived social support and psychosocial adjustment of the patients. Quality of life is reduced in both physical and mental aspects. Diagnosis and treatment of psychopathology in MG patients is crucial to decrease disease burden.

**Key words:** Myasthenia gravis, psychopathology, quality of life, psychosocial factors

### Myasthenia Gravis Hastalarında Psikopatoloji, Psikososyal Etkenler ve Yaşam Kalitesi Özet

**Giriş:** Myasthenia Gravis (MG), hastaların fiziksel, psikolojik ve sosyal fonksiyonlarını etkileyen kronik bir hastalıktır. Bu çalışmada MG hastalarında psikiyatrik komorbidite, bazı psikososyal etkenleri ve bunların hastaların yaşam kalitesiyle ilişkisini saptamayı amaçladık.

**Metodlar:** Toplam 52 MG hastasına psikiyatrik muayene yapıldı ve sosyodemografik veri formu, Hastane Anksiyete ve Depresyon Ölçeği, SF-36 Yaşam Kalitesi Ölçeği, Kısa Formu, Hastalığa Psikososyal Uyum Özbildirim Ölçeği, Çok-boyutlu Algılanan Sosyal Destek Ölçeği ve Travma Sonrası Büyüme Envanteri uygulandı.

**Bulgular:** Hastaların % 36.5 (n=19)'u herhangi bir psikiyatrik tanı almazken; %21.2 (n=11)'si uyum bozukluğu, %19.2 (n=10)'si depresyon ve %23.1 (n=12)'i anksiyete bozukluğu tanısı aldı. Psikiyatrik tanı alan hastalar SF-36 Yaşam Kalitesi Ölçeği'nin genel sağlık, canlılık, sosyal fonksiyon, duygusal rol ve ruhsal sağlık alanlarında daha düşük puan aldılar. Hastalığa psikososyal uyum, toplam algılanan sosyal destek ve arkadaş desteği puanları, psikiyatrik tanı almayan hastalarda daha yüksekti. Psikososyal etkenler ve yaşam kalitesi arasında anlamlı ilişkiler saptandı.

**Sonuç:** MG hastalarında oldukça sık görülen psikiyatrik sorunlar hastaların yaşam kalitesi, algılanan sosyal destek ve psikososyal uyumlarıyla ilişkilidir. Yaşam kaliteleri hem fiziksel hem de ruhsal alanlarda azalmıştır. MG hastalarında psikopatolojinin tanınması ve tedavisi hastalık yükünün azaltılmasında elzemdir.

**Anahtar Kelimeler:** Myasthenia gravis, psikopatoloji, yaşam kalitesi, psikososyal etkenler

## INTRODUCTION

Myasthenia gravis (MG) is a chronic, autoimmune disease of the skeletal neuromuscular junction. The clinical picture of MG ranges from pure ocular symptoms, focal bulbar symptoms such as dysphagia and dysarthria, to generalized involvement including limb and axial muscles.<sup>(23,53)</sup> Patients usually present with asymmetrical ptosis and/or diplopia, bulbar symptoms such as difficulties in chewing, speaking and swallowing and generalized fatigue. Infections, pregnancy, postpartum period and some medications may worsen the disease.<sup>(52)</sup> Furthermore, MG patients like patients with other chronic diseases may present with a wide range of psychological and social disabilities.<sup>(5,34)</sup>

Patients with MG may be at increased risk of psychiatric disorders for several reasons. While some old studies suggest a central cholinergic transmission deficit,<sup>(7,14)</sup> more recent studies do not support central nervous system involvement in MG.<sup>(45)</sup> MG is an autoimmune disease which could potentially influence brain functions.<sup>(13)</sup> As MG is a chronic and debilitating disease with unpredictable progression, a psychological reaction in MG patients could be expected. Few studies that systematically investigate psychiatric disorders in MG reported that psychiatric morbidity usually appeared as depressive and anxiety disorders.<sup>(31)</sup>

Chronic illnesses have a major impact on all aspects of an individuals' life, affecting physical, psychological and social functioning.<sup>(20)</sup> Chronic symptoms, long-lasting treatment, psychiatric co-morbidity and social disabilities can cause significant decrement of health-related quality of life (HRQoL) in patients with MG.<sup>(5)</sup> Conclusions of studies investigating HRQoL in patients with MG using SF-36 questionnaire are inconsistent. Several studies have shown that HRQoL is impaired predominantly in its physical aspects,<sup>(38,43,57)</sup> while others have reported impairment in both mental and physical domains.<sup>(5,32,34,36,39,44)</sup>

Recognizing symptoms and taking appropriate attitudes, using medications effectively, managing complex self-management regimens and making difficult life style adjustments result in psychological consequences of the illness.<sup>(33,54,56)</sup> Although most of the patients actively try to adapt to their state of illness, psychopathologic issues and specific personality traits could have negative influence on psychosocial adjustment process.<sup>(30,42)</sup>

Recent research showed that social support acts as primary protective factor for mortality, morbidity and disability in chronic patients by facilitating healthy behaviors and compliance to treatments.<sup>(8,41,49,60)</sup> Social support has a crucial role in MG considering that

patients suffer from a chronic treatable disease and have to follow strict treatment regimens for a prolonged period of time. Social support is also a predictor of mental health status in patients with MG.<sup>(40)</sup>

The diagnosis of a life-threatening, chronic disease can be a traumatic experience. However, many survivors report also various positive changes, referred as post-traumatic growth. Quality of social support, patients' coping styles and several indicators of mental and physical health were found to be associated with post-traumatic growth. The results indicate potential adaptive significance of post-traumatic growth.<sup>(4)</sup> To our knowledge, there is no study investigating post traumatic growth in patients with MG in literature.

Research about psychopathology, psychosocial factors and their association with quality of life in MG is scarce in literature. In the current study, we aim to investigate the frequency of psychiatric disorders, features of psychosocial adjustment to disease, perceived social support, posttraumatic growth and their relations with health related quality of life in patients with MG.

## MATERIAL AND METHODS

### Sampling

This study was conducted at Psychiatry and Neurology Departments of Uludag University Medical Faculty Hospital in Turkey. Sixty five patients who applied to Neurology department and were diagnosed as MG were recruited. The exclusion criteria for the patients were as follows: psychotic, demented or mentally retarded patients, alcohol or substance abusers, patients who were on psychiatric treatment during last 3 months, patients who had an invasive procedure during last 3 months, patients with another chronic disease other than MG and illiterate patients. The patients on psychiatric treatment were excluded to eliminate the treatment effects on scale scores. After applying the

exclusion criteria, 52 patients were included in the study.

Physical and neurological examinations were done by a neurologist and routine blood tests were applied to all subjects. Patients underwent a psychiatric examination comprised of a semi-structured clinical interview of the DSM-IV-TR. The Ethical Committee of the institution approved the study. All subjects gave written informed consent to participate in this study. The assessments were performed using the scales below: Socio-demographic data form, Hospital Anxiety and Depression Scale (HAD), Quality of Life Scale (QOL) Short Form 36 (SF-36), Psychosocial Adjustment of Illness Scale – Self Report (PAIS-SR), Multidimensional Scale of Perceived Social Support (MSPSS) and Posttraumatic Growth Inventory (PTGI).

### Measures

Socio-demographic data form: A form prepared by the researchers in order to obtain socio-demographic data and to assess clinical features related with MG.

Hospital Anxiety and Depression Scale (HADS): The Hospital Anxiety and Depression Scale (HADS) is a 14-item scale that provides a brief state measure of anxiety and depression. Turkish version of HADS is valid and reliable in medically ill patients.<sup>(3)</sup>

Quality of Life Scale (QOL) Short Form 36 (SF-36): The form was developed by Ware and Sherbourne.<sup>(55)</sup> Turkish validity study was done by Koçyiğit et al. It is composed of 36 items that measure eight dimensions: physical functioning, social functioning, limitations of role functioning based on physical problems, limitations of role functioning based on emotional problems, mental health, energy/vitality, body pain and general health perceptions. Higher scores point to increased quality of life.<sup>(29)</sup>

Psychosocial Adjustment to Illness Scale-Self Report (PAIS-SR): Developed by

Derogatis and Lopez in 1983, this is a multidimensional scale to examine the psychosocial adjustment to the disorder.<sup>(1,16)</sup> Lower scores from the PAIS-SR scale indicate good psychosocial adjustment to the disorder. PAIS-SR scores below 35 are considered as “good psychosocial adjustment”, scores from 35 to 51 as “fair psychosocial adjustment” and scores above 51 as “poor psychosocial adjustment”. Turkish adjustment of PAIS-SR and its validity and reliability studies in Turkey were performed by Adaylar.<sup>(1)</sup>

Multidimensional Scale of Perceived Social Support (MSPSS): In an attempt to measure social support, Multidimensional Scale of Perceived Social Support (MSPSS) was developed to be used in clinical and non-clinical samples.<sup>(61)</sup> It has been tested on people from different age groups and cultural backgrounds and found to be reliable and valid.<sup>(10,12)</sup> MSPSS consists of three sub-scales: Family, Friends, and Significant Others. The factorial structure, reliability and construct validity of MSPSS were investigated in Turkey to check the generality of the previous findings from Western samples.<sup>(19)</sup>

Posttraumatic Growth Inventory (PTGI): The PTGI was developed by Tedeschi and Calhoun to assess positive changes after traumatic experiences with 21 items.<sup>(48)</sup> In the Turkish adaptation study of the scale, good internal consistency was found with a Cronbach's alpha of .94.<sup>(17)</sup>

### Statistical Analysis

All statistical analyses were performed with SPSS ver. 22.0. Shapiro Wilk test was used as normality test. Continuous variables were compared using Student's t-test for normally distributed data and Mann-Whitney U test when the data were not normally distributed. Categorical variables were compared using Pearson's chi-squared test, Fisher's exact test and Fisher-Freeman-Halton test. Correlations between variables were tested using

Spearman correlation coefficients. A p-value <0.05 was considered as significant.

### RESULTS

Fifty two patients, with a mean age of 45.1 ± 12.6 years were recruited in the study. Among 52 patients, 26.9% (n=14) were men and 73.1% (n=38) were women. Demographic findings including age, gender, marital status, education level, smoking status and exercise status are given in Table 1. Demographic findings of patients who were diagnosed with a psychiatric disorder did not differ significantly from those who had no psychiatric diagnosis.

The clinical characteristics of the patients are given in Table 2. There were no statistically significant difference between patients with or without a psychiatric diagnosis in terms of MG type, number of hospitalization, intensive care unit need, thymectomy, time since diagnosis, duration between onset and diagnosis and medication type. Among 52 patients, 36.5% (n=19) had no psychiatric diagnosis; 21.2% (n=11) had adjustment disorder; 19.2% (n=10) had depression and 23.1% (n=12) had anxiety disorder. Most of the patients with adjustment disorder had anxiety and depressive symptoms simultaneously. Some patients who were diagnosed with depression had additional anxiety symptoms, but these did not meet the diagnostic criteria of a comorbid anxiety disorder.

Table 3 shows normative scores of SF-36 in Turkish population and Table 4 shows mean scores of HADS, SF-36, PAIS-SR, MSPSS and PTGI in two groups of MG patients with and without a psychiatric diagnosis. Depression (p<0.001) and anxiety (p<0.001) scores of patients with a psychiatric diagnosis are significantly higher than those without a psychiatric diagnosis. Five of 8 domains of SF-36 including general health, vitality, social functioning, emotional role and mental health differed significantly (p<0.05) between groups. Patients without a

psychiatric diagnosis had higher scores in these 5 domains. PAIS-SR scores of patients without a psychiatric diagnosis were significantly lower than those with a psychiatric diagnosis ( $p < 0.05$ ). There was no statistically significant difference between two groups in terms of PTGI scores. Regarding MSPSS; total score and friends score were significantly higher ( $p < 0.05$ ) in patients without a psychiatric diagnosis.

HADS depression scores correlated negatively with emotional role scores of SF-36 ( $r = -.300$ ,  $p < 0.05$ ). HADS depression scores were also negatively correlated with total ( $r = -.364$ ,  $p < 0.01$ ) and friends ( $r = -.328$ ,  $p < 0.05$ ) scores of MSPSS. HADS anxiety scores correlated negatively with mental health ( $r = -.320$ ,  $p < 0.05$ ) scores of

SF-36 and total ( $r = -.376$ ,  $p < 0.01$ ) and friends ( $r = -.455$ ,  $p < 0.01$ ) scores of MSPSS.

PAIS-SR scores correlated positively with HADS depression ( $r = .573$ ,  $p < 0.01$ ) and HADS anxiety ( $r = .465$ ,  $p < 0.01$ ) scores and negatively with friends ( $r = -.362$ ,  $p < 0.01$ ) and significant others scores ( $r = -.374$ ,  $p < 0.01$ ) of MSPSS.

General health score of SF-36 is positively correlated with total ( $r = .273$ ,  $p < 0.05$ ) and friends ( $r = .293$ ,  $p < 0.05$ ) scores of MSPSS. Vitality score of SF-36 is again positively correlated with total ( $r = .350$ ,  $p < 0.05$ ) and friends ( $r = .382$ ,  $p < 0.01$ ) scores of MSPSS. Social functioning score of SF-36 is positively correlated with friends ( $r = .278$ ,  $p < 0.05$ ) scores of MSPSS.

**Table 1.** Demographic features of myasthenia gravis (MG) patients

Demographic features	MG patients (n=52)
<b>Age (years)</b>	45.1 ± 12.6
<b>Gender</b>	
Male	14 (26.9%)
Female	38 (73.1%)
<b>MaritalStatus</b>	
Married	32 (61.5%)
Single	12 (23.1%)
Divorced or widowed	8 (15.4%)
<b>EducationStatus</b>	
Primary school	25 (48.1%)
High school	19 (36.5%)
University	8 (15.4%)
<b>SmokingStatus</b>	
Smoking	21 (40.4%)
Non smoking	31 (59.6%)
<b>ExerciseStatus</b>	
Exercising	18 (34.6%)
Not exercising	34 (65.4%)

**Table 2.** Clinical characteristics of myasthenia gravis (MG) patients

Clinical characteristics	Patients (n=52)
<b>MG Type</b>	
Ocular MG	9 (17.3%)
Generalized MG	43 (82.7%)
<b>Number of hospitalization since onset</b>	1.2 ± 0.9
<b>Hospitalization need in intensive care unit</b>	10 (19.2%)
<b>Thymectomy</b>	15 (28.8%)
<b>Time since MG diagnosis (months)</b>	23.1 ± 22.3
<b>Time between onset and diagnosis (months)</b>	3.4 ± 4.6
<b>Medication</b>	
Pyridostigmine	47 (90.4%)
Corticosteroids	41 (78.8%)
Azathioprine	9 (17.3%)
<b>Psychiatric Diagnosis</b>	
No diagnosis	19 (36.5%)
Adjustment disorders	11 (21.2%)
Depressive disorders	10 (19.2%)
Anxiety disorders	12 (23.1%)

**Table 3.** Normative scores of SF-36 in Turkish population

Domains	Mean ± SD
Physical functioning	86.6 ± 25.2
Physical role	89.5 ± 29.6
Bodily pain	86.1 ± 20.6
General health	73.9 ± 17.5
Vitality	67.0 ± 13.8
Social functioning	94.8 ± 14.2
Emotional role	94.7 ± 20.9
Mental health	73.5 ± 11.6

**Table 4.** Hospital Anxiety and Depression Scale (HADS), Psychosocial Adjustment to Illness Scale-Self Report (PAIS-SR), Multidimensional Scale of Perceived Social Support (MSPSS), Quality of Life Scale (QOL) Short Form 36 (SF-36) and Posttraumatic Growth Inventory (PTGI) scores of MG patients with and without psychiatric disorders

Scales	MG patients with psychiatric disorders (n=33)	MG patients without psychiatric disorders (n=19)	P value
<b>HADS</b>			
Depression score	9.9 ± 4.8	4.3 ± 3.2	
Anxiety score	10.6 ± 4.0	4.5 ± 2.3	<0.001*
			<0.001*
<b>PAIS-SR</b>	48.7 ± 18.9	36.3 ± 13.1	0.027*
<b>MSPSS</b>			
Total social support	59.3 ± 11.9	67.7 ± 10.9	0.015*
Family support	22.8 ± 5.7	23.6 ± 4.8	0.73
Friend support	18.7 ± 6.8	23.8 ± 6.6	0.017*
Other than family and friend support	17.8 ± 5.5	20.3 ± 4.8	0.11
<b>QOLSF-36</b>			
Physical functioning	62.1 ± 16.7	65.6 ± 17.2	0.51
Physical role	53.6 ± 13.6**	57.1 ± 13.6**	0.36
Bodily pain	52.7 ± 17.9**	55.8 ± 15.4**	0.52
General health	44.1 ± 11.5**	55 ± 11.2**	0.002*
Vitality	39.7 ± 12.5**	47.4 ± 12.2**	0.034*
Social functioning	57.9 ± 16.9**	68.7 ± 13.9**	0.025*
Emotional role	61.3 ± 15.9**	69.2 ± 13.8**	0.044*
Mental health	56.9 ± 12.6**	66.4 ± 12.2	0.012*
<b>PTGI</b>	50.6 ± 15.9	53.3 ± 14	0.51

\*p&lt;0.05

\*\*Difference from normative sample more than 1 standard deviation

## DISCUSSION

Our study revealed a high prevalence of psychopathology in patients with MG in comparison to what is expected in the general population. Among MG patients 21.2% had adjustment disorder, 19.2% had depressive disorder and 23.1% had anxiety disorder. Magni et al. reported that 14% of MG patients had an affective disorder and 22% had adjustment disorder.<sup>(35)</sup> Paradis et al. observed increased rates of panic

disorder (7%) in MG.<sup>(37)</sup> The frequency of depressive state in individuals was 33%, 13.6% and 26.1 % in some other studies.<sup>(21,47,58)</sup>

There are studies suggesting that psychopathology was more prevalent in female gender and correlated with disease duration, disease severity and corticosteroid use.<sup>(6,18,35,47,58)</sup> Conversely, some studies found no association of psychopathology with disease severity, corticosteroid therapy, thymectomy or age

of MG onset.<sup>(35,37,58)</sup> In our study, there was no significant association between psychopathology and demographic or clinical characteristics of MG patients.

Several studies have assessed HRQoL in patients with MG using SF-36; however, the results are inconsistent.<sup>(5,32,34,36,38,39,43,44,57)</sup> The results of the current study manifested reduced HRQoL in almost all domains of SF-36 in MG patients compared with a Turkish normative cohort.<sup>(15)</sup> This result is in line with the studies of Paul et al. and Twork et al.<sup>(38,50)</sup> We found that patients with a psychiatric diagnosis had significantly lower scores in general health, vitality, social functioning, emotional role and mental health domains of SF-36 compared with those patients without a psychiatric diagnosis. Four of these five domains (vitality, social functioning, emotional role and mental health) belong to mental health indicating that having a psychiatric diagnosis is related with decrement mostly in mental aspects of HRQoL. In our study, we also found that HADS depression scores correlated negatively with emotional role scores and HADS anxiety scores correlated negatively with mental health scores. Emotional role score determines the effect of emotional functioning on work or daily activities whereas mental health represents for overall mood during the previous for weeks. Ulvik et al. stated that in both genders, the HADS subscales for anxiety and depression were significantly related to all SF-36 subscales and most strongly related to the mental health aspect.<sup>(51)</sup> Blum et al. state that the factor most strongly associated with poor QOL was depression in MG patients.<sup>(9)</sup>

Previous studies have shown that mental aspect of SF-36 was impaired in all MG patients, even those with a mild disease severity.<sup>(36)</sup> Rostedt et al. indicated that bulbar and generalized involvement resulted in impairment of mental aspects of quality of life, whereas ocular involvement

does not.<sup>(44)</sup> Depression is related with reduced HRQoL in a number of chronic illnesses and might result from poor physical health along with limited activity.<sup>(25)</sup> Twork et al. stated that comorbid depression was an important determinant of HRQoL in patients with MG.<sup>(50)</sup> In the presence of psychopathology, the effects of chronic illness and possible adverse events of treatment could be perceived more negatively resulting with more decrement in HRQoL.

Social support's positive role towards reduced mortality and morbidity levels has been recognized in several studies.<sup>(2,22)</sup> According to a meta-analytical review only perceived support, but not received support, has been linked to health-related outcomes.<sup>(26)</sup> Numerous studies indicate that social support is an important determinant of HRQoL and depression and anxiety in different chronic diseases.<sup>(27,46,59)</sup> There are few studies investigating association of social support with HRQoL in MG patients. Basta et al. reported that MG patients with better social support had better HRQoL.<sup>(5)</sup> Chen et al. stated that the importance of social and peer support was a key factor to live with MG.<sup>(11)</sup> In line with these studies, we found a positive correlation of some domains of HRQoL with social support. General health and vitality scores of SF-36 are found to be positively correlated with total and friends support and social functioning score was positively correlated only with friends support. There is no study searching the relation of social support with psychopathology in patients with MG. We found that MG patients with a psychiatric disorder had significantly lower total and friends support scores. Besides, HADS depression and anxiety scores correlated negatively with total and friends support. This result is in line with the study of Jensen et al. indicating that support from friends was more closely associated with lower levels of depression in patients with physical disabilities.<sup>(24)</sup>

Psychopathology may be the cause or result of reduced perception of social support especially from friends. In our culture, family support is readily given in cases of conditions like illness, accidents, etc. which make the individual dependent of care. When an individual has an illness related with physical disability, it is more difficult for him/her to socialize outside home because of cultural reasons and insufficient environmental facilities. Having a psychiatric disorder also prevents socialization. Therefore, it becomes difficult to perceive support from friends and this social isolation together with physical illness could make the individual more prone to develop psychopathology.

In literature there is no study focusing on psychosocial adjustment and its predictors in MG. In the present study we found out that MG patients without a psychiatric disorder had good-fair levels of psychosocial adjustment while patients with a psychiatric diagnosis had fair-poor levels. We observed a correlation of psychosocial adjustment with depression and anxiety levels. Our results are in line with the study of Kocaman et al. who reported that anxiety and depression had an impact on psychosocial adjustment in individuals with physical illness. Our study revealed that perceived social support of friends and significant others was also associated with psychosocial adjustment again in line with the study of Kocaman et al.<sup>(28)</sup>

The majority of the studies in literature investigated post traumatic growth and its relationships to health indicators after the diagnosis of cancer, HIV/AIDS, cardiac disease, multiple sclerosis and rheumatoid arthritis. Factors such as quality of social support, patients' coping strategies and several indicators of mental and physical health were consistently associated with post-traumatic growth.<sup>(4)</sup> To our knowledge, there is no study investigating the predictors of post traumatic growth in myasthenia gravis. In the present study, we

found no association of demographic and clinical characteristics of MG patients with post traumatic growth. We also could not find a correlation of post traumatic growth with depression and anxiety levels, HRQoL, perceived social support and psychosocial adjustment. This may be due to the fact that myasthenia gravis is not a disease that is perceived as life-threatening and thus the term post traumatic growth is somewhat irrelevant for the disease. It is necessary to set up larger scale studies to understand the process of post traumatic growth in MG.

There are some limitations of the present study. Despite the fact that MG is an uncommon disease, small sample size is the major limitation and our results may not be representative of MG patients in general. Cross-sectional design is the second major limitation which does not allow to infer causality but only to show associations. Thirdly, our study does not have a control group consisting of healthy individuals or patients with another chronic disease.

We have shown a high prevalence of psychopathology in MG patients. Psychopathology has a significant impact on quality of life, perceived social support and psychosocial adjustment. Quality of life is reduced in both physical and mental domains. Social support is an important predictor of at least some domains of QoL and effects psychosocial adjustment. We suppose that our results may have a practical implication. We believe that psychiatric disorders should be carefully evaluated and treated in patients with MG in order to reduce disease burden. Interventions to increase support from friends should be considered in psychosocial therapeutic protocols.

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