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ORIGINAL ARTICLE

Evaluation of anxiety and depression scales and quality of LIFE in cervical dystonia patients on botulinum toxin therapy and their relatives

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Abstract

Objective In this study, quality of life and psychiatric comorbid disorders were investigated in patients with cervical dystonia and their spouses and we also investigated the effect of botulinum toxin (BTX) treatment on these parameters.

Material and method Thirty patients with cervical dystonia (CD) on BTX treatment and their spouses ($n = 30$) were included. Beck Depression Scale (BDS), State-Trait Anxiety Inventory I and II (STAI-I, STAI-II), Hospital Anxiety Scale (HAS), Hospital Depression Scale (HDS) for psychiatric comorbid disease assessment, Toronto Western Spasmodic Torticollis Scale (TWSTRS) for disease activity assessment, and Craniocervical Dystonia Questionnaire (CDQ-24), Cervical Dystonia Impact Profile (CDIP-58), and Short Form 36 (SF-36) questionnaires for quality of life assessment were used. BDS, STAI-I and STAI-II, HAS, HDS, and SF-36 scales were also obtained from the spouses. The same tests were applied both before and 8 weeks after the BTX treatment.

Conclusion In our study, an increase in psychiatric comorbid disorders such as depression and anxiety was observed and the quality of life was adversely affected in all areas in patients. In the spouses of the patients, the rates of psychiatric comorbid disorders such as depression and anxiety were found to be increased when compared to healthy subjects while vitality, mental health, and general health perception were found to be negatively affected.

Patients showed improvements in anxiety level, disease activity, and overall quality of life scales after BTX treatment.

Keywords Cervical dystonia · Botulinum toxin therapy · Quality of life · Depression · Anxiety

Introduction

Cervical dystonia (CD) is the most common form of adult-onset focal dystonia, and patients may experience limitations in daily life activities due to the abnormalities in head-neck posture, pain, or tremor [1]. In patients with cervical dystonia, the quality of life is an important issue to be considered as in all chronic diseases. However, studies performed on this subject are quite limited. It is known that physical symptoms are accompanied by psychiatric comorbid disorders in CD cases. In patients with CD, the quality of life is significantly affected by the mood disorders, anxiety, depression, low self-esteem and self-confidence, timidity, and social anxiety disorder (social phobia) derived from abnormal posture and pain [2–4].

Even though the physical symptoms seen in the patients can be treated effectively, diagnosis of psychiatric comorbid disorders may be difficult, and if not treated, it will be inevitable that the quality of life will be adversely affected. In patients with CD, it has been reported that age, gender, social support, socioeconomic status, anxiety, depression, and pain can affect the quality of life in addition to the severity of dystonia [5]. Therefore, patients should be evaluated in terms of both emotionally and socially as well as physical symptoms in follow-up sessions. The quality of life scales were developed for CD patients based on this necessity. These scales are extremely important since they allow the physicians to evaluate the disease activity and assess the quality of life before and after treatment as well as the efficacy of the treatment, to determine the objective side effects, and to direct the patients with the right health policies. Since the scales used to assess the quality of life make it easier to perform patient follow-up,

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drug selection, and evaluation of treatment efficacy, the cost of the disease significantly reduces [6].

Cervical dystonia and all chronic diseases affect the quality of life negatively of those who live with the patient and the relatives. There are only a limited number of studies evaluating the quality of life in patients and especially in their relatives. It has been reported that the quality of life is less affected in patients receiving social support [7]. Regarding this information, it can be suggested that the success of CD treatment is not only dependent on elimination of physical symptoms but also improving the emotional and social status of the patients and even their relatives.

In this study, we examined the effects of cervical dystonia on quality of life in patients and their spouses in the context of comorbid disorders such as anxiety, depression, and social functioning. The aim of this study was to investigate whether there was a significant association between the quality of life and gender, age, onset of the disease, administration time of botulinum toxin (BTX), and the social support during the duration of the disease. In addition, we performed the same tests 8 weeks after the first evaluation tests and aimed to investigate whether there was any improvement in disease activity and the quality of life in patients and their spouses after BTX injections.

Materials and methods

This study was carried out in Uludag University in accordance with the Declaration of Helsinki (Uludag University Medical Research Ethics Committee approved the study with the Decision no. 2016–19/4 dated to 15 November 2016). The patients and their spouses were informed about the details of the study, and their oral and written informed consents were obtained. In our study, 30 patients receiving BTX treatment (20 females, 10 males, mean age 49.03 ± 13,15 years, range 18–75 years) who have admitted to Uludag University, Medical Faculty, Department of Neurology, Movement Disorders Clinic, and diagnosed with primary (idiopathic) cervical dystonia after detailed anamnesis and full neurological examination and their spouses were included. The patients had no medical or psychiatric problems affecting their quality of life except for cervical dystonia. Patients with a history of neurodegenerative disorders, antipsychotic drug use in the past 6 months, tardive dystonia, and head and neck surgery were excluded from the study. All interviews were recorded using a camera with the permission of the patients. The spouses of patients who were living together, able to respond to questions, and willing to participate were included in the study after obtaining the consent forms. All neurological examinations were performed by a neurology specialist, and BTX injection was performed by a physician specialized in movement disorders.

Beck Depression Scale (BDS), State-Trait Anxiety Inventory I and II (STAI-I, STAI-II), Hospital Anxiety Scale (HAS), Hospital Depression Scale (HDS), State Anxiety Scale, Toronto Western Spasmodic Torticollis Scale (TWSTRS), Craniocervical Dystonia Questionnaire (CDQ-24), Cervical Dystonia Impact Profile (CDIP-58), and Short Form 36 (SF-36) questionnaires were obtained from patients before BTX inection.

BDS, STAI-I and STAI-II, HAS, HDS, and SF-36 scales were also obtained from spouses. Several studies report that patients receiving BTX treatment return to their pre-injection status after an average of 2.6 months [8]. Considering the patients being in their clinically best condition at 8 weeks, the same tests for evaluating the efficacy of the treatment, side effects, and comorbidities were performed to the patients and their spouses after 8 weeks. Furthermore, video recordings were obtained from the patients prior to the treatment and in control examinations in accordance with the TWSTRS Video Recording Protocol.

Statistical analysis

Statistical analysis was performed using SPSS 23.0 (IBM Corp., released 2015, IBM SPSS Statistics for Windows, version 23.0, Armonk, NY, IBM Corp.) statistical package program. Descriptive statistics for the quantitative data were recorded as mean and standard deviation or median (minimum–maximum). The Shapiro-Wilk test was used to examine if the data showed normal distribution. In paired groups, paired sample *t* test was used in normally distributed data, whereas Wilcoxon sign-rank test was used in data not normally distributed. The Pearson correlation coefficient was used for the correlation assessment ($p \leq 0.05$ was found as statistically significant).

Results

The demographic data of the patients and the spouses of the patients are summarized in Tables 1 and 2. The TWSTRS scale results for assessing the activity of the disease are summarized in Table 3 and the quality of life scales are summarized in Table 4.

Patients' depression and anxiety scales were evaluated before the treatment. Depression coexistence was found in 14 (46.7%) patients in first examination. Of these patients, 9 (30%) patients were found to have mild depression, 3 (10%) had moderate depression, and 2 (6.7%) had severe depression. High level of anxiety was observed in 8 (26.6%) patients. In the STAI-I scale, 11 (36.7%) patients were found to have mild anxiety while 9 (30%) patients had severe anxiety. In the STAI-II scale, 8 (26.6%)

Table 1 Patient's characteristics

Patients	Female		Male	
$n = 30$	20 (66.6%)		10 (33.3%)	
Age (year), mean SD	49.03 (22–71)			
Age at dystonia onset (year), mean	37.9 (10–64)			
Mean delayed time of diagnosis of dystonia (year)	5.5 (0–22)			
BTX therapy (year), mean	5.6 (1–19)			
Marital status	Marriage (%)		Divorced (%)	
$n = 30$	22 (73.3%)		8 (26.7%)	
Educational level	Primary–middle school		High school–university	
$n = 30$	17 (56.7%)		13 (43.3%)	
$n = 30$	Primary school	Middle school	High school	University
	14 (46.7%)	3 (10%)	11 (36.7%)	2 (6.7%)
Employment status	Employed (%)		Unemployed (%)	
$n = 30$	12 (40%)		18 (60%)	

patients were found to have mild anxiety while severe anxiety was found in 17 (56.7%) patients (Table 5).

Patients' spouses were also examined before the treatment by means of depression and anxiety. Eleven (36.7%) patients were diagnosed with depression in initial evaluation; high level of anxiety was found in 5 (166%) patients according to the anxiety scales. STAI-I revealed mild anxiety in 5 (16.6%) patients and severe anxiety in 7 (23.3%) patients. STAI-II revealed mild anxiety in 2 (6.7%) patients and severe anxiety in 12 (40%) patients (Table 6).

The SF-36 scale was used to evaluate the quality of life in patients' spouses. The results in vitality, mental health, and perception of general health subscales were found to be below normal values (Table 7).

The tests were performed both in patients and their spouses at first examination and 8 weeks after. The first and final results were compared for each parameter. There was a statistically significant improvement by means of depression and anxiety after STAI-I and STAI-II evaluation ($p = 0.002$ and $p = 0.01$, respectively). A statistically significant improvement in disease activity was observed in two TWSTRS scales, both for the general scale and each subscale ($p < 0.001$). A statistically significant improvement was observed in all scales and subscales for all the tests by means of CDQ-24, CDIP-58, and SF-36, which were used to assess the quality of life ($p < 0.001$) (Table 8).

The spouses of the patients were similarly evaluated using depression, anxiety, and quality of life scales before and 8 weeks after treatment. Only STAI-1 values showed a statistically significant improvement in depression and anxiety scales ($p = 0.001$). For the quality of life scales, vitality and mental health subscales were found to be significantly improved ($p < 0.001$) (Table 9).

In order to identify the risk factors in depression-anxiety and quality of life scales, gender, marital, educational and working statuses, age, age at the onset of the disease, the onset of the treatment, and delay of diagnosis were compared in patients and spouses. When depression and anxiety scales were evaluated, a statistically significant improvement was observed in STAI-1 and STAI-II in females ($p = 0.003$ and $p = 0.016$), whereas a statistically significant improvement was observed in terms of BDI and HAS in males ($p = 0.031$

Table 2. Patient's spouse characteristics

Patients' spouses	Female		Male	
$n = 30$	20 (66.6%)		10 (33.3%)	
Age (year), mean	46.03 (22–70)			
Educational level	Primary–middle school		High school–university	
$n = 30$	14 (46.7%)		16 (53.3%)	
$n = 30$	Primary school	Middle school	High school	University
	13 (% 43,3)	1 (% 3,3)	14 (% 46,7)	2 (% 6,7)
Employment status	Employed (%)		Unemployed	
$n = 30$	13 (43.3%)		17 (56.7%)	

Table 3 TWSTRS scores of cervical dystonia patients

TWSTRS total score	34.26 ± 3.28
1. Severity score	17.86 ± 3.15
2. Disability score	8.53 ± 2.72
3. Pain score	7.90 ± 3.99

and $p = 0.048$, respectively). When the disease activity was compared between females and males, a statistically significant improvement was found in all subscales of TWSTRS ($p < 0.001$ in females and $p = 0.004$–0.008 in males). It was determined that the mean duration of BTX treatment in patients with cervical dystonia was 5 to 6 years. In order to investigate whether there was a difference by means of depression and anxiety between patients on BTX treatment related to the duration of treatment, patients were divided into two groups as those who have been treated less than 5 years and more than 5 years. Evaluation of depression and anxiety scales showed a statistically significant improvement in STAI-I and STAI-II scales in patients who were treated with BTX less than 5 years ($p = 0.016$ and $p = 0.01$, respectively).

In cases with cervical dystonia, the average duration of delay of diagnosis was calculated as 5.5 years (Table 1). In order to investigate whether delay in diagnosis was affecting the results of the patients, the participants were divided into two groups as those who were diagnosed 5 years before and after the onset of the disease. Depression and anxiety scale evaluation revealed that STAI-I and STAI-II scales were significantly improved in patients after BTX treatment who were diagnosed 5 years before the onset of the disease when compared to those diagnosed 5 years after ($p = 0.002$ and $p = 0.013$, respectively).

When the correlation between disease activity and depression anxiety was evaluated, it was determined that the total score in TWSTRS correlated positively with HAS and HDS scales. The increase in disease activity was found to be related to an increase in HAS and HDS scores.

When the correlation between the disease activity and quality of life were examined, it was found that there was no statistically significant correlation between disease activity and CDQ-24 and stigma scores. There was a statistically significant correlation between the CDIP-58 scale and the total score, disability, and pain subscales in TWSTRS. In other words, it was observed that with the patients who had high scores in disease activity, disability and pain subscales had high scores on the CDIP-58 scale, as well. It was found that there was a correlation between TWSTRS total score and physical function, role-physical, role-emotional, mental health, pain, and general health perception subscales. Moreover, pain and general health perception subscales were found to be statistically more significant ($r = 486$, $p = 0.006$ and $r = 493$, $p = 0.006$).

Statistically significant correlation was observed between the role-physical, role-emotional, vitality, mental health, and pain subscales with the severity of dystonia subscale. The correlations between severity of dystonia and role-physical and pain subscales were found to be statistically more significant ($r = 463$, $p = 0010$ and $r = 483$, $p = 0007$).

There was a statistically significant correlation between pain subscale of TWSTRS and physical function and general health perception subscales of SF-36 ($r = 364$, $p = 0048$ and $r = 0.561$, $p = 0.001$). When the quality of life scales were compared to each other, it was observed that CDQ-24 and all subscales of the SF-36 were correlated except for the role-emotional and general health perception subscales. Stigma was found to be correlated with all subscales of SF-36 except general health perception and role-emotional subscales.

Table 4 Quality of life scales of cervical dystonia patients

Scales	Patients (mean score)
CDQ-24	46.27 ± 12.71
Stigma	58.41 ± 15.19
CDIP-58	39.85 ± 8.66
SF-36	Patients (mean score)
Physical functioning	51.83 ± 21.91 (80.6–87.2)
Role limitations, physical	32.50 ± 18.74 (82.9–89.8)
Role limitations, emotional	39.99 ± 25.36 (89.0–92.8)
Vitality	48.00 ± 12.83 (63.4–65.7)
Mental health	54.80 ± 16.10 (70.1–71.0)
Social functioning	57.08 ± 10.21 (90.1–91.7)
Pain	62.08 ± 12.63 (81.0–85.1)
General health perception	42.45 ± 10.79 (69.1–73.6)

Discussion

Cervical dystonia is a disease that can have a delayed diagnosis and can be difficult to diagnose due to the diversity of clinical presentation and the fact that the disease is not well recognized. In studies conducted by Queiroz et al. in 2001 and Jog M. et al. in 2011, the delay of diagnosis was reported to be 3 and 5.4 years, respectively [4, 9]. The mean duration of delay of diagnosis was 5.5 years in our study. This difference may be due to the variety of clinical presentation, effects of psychiatric disorders, and the fact that the illness is not well recognized by physicians.

Tomic et al. emphasized the importance of increased depression and anxiety level on disability. In the same study, it was reported that disability affects the development of depression and anxiety [10]. In the study of Ben-Shlomo et al. which was conducted in 289 patients in seven European countries, it has been reported that the highest predictor of quality of life

Table 5 Depression and anxiety scales of the patients

Beck Depression Inventory	Patient number (%)	Anxiety HAS	Patient number (%)	State anxiety STAI-I	Patient number (%)	Trait anxiety STAI-II	Patient number (%)
None	16 (53.3)	None	22 (73.3)	None	10 (33.3)	None	5 (16.6)
Mild	9 (30)			Mild	11 (36.7)	Mild	8 (26.6)
Moderate	3 (10)	Severe	8 (26.6)				
Severe	2 (6.7)	anxiety		Severe	9 (30)	Severe	17 (56.7)

was depression and anxiety. Similarly, Slawek et al. reported that depression was the main determinant of worsening in quality of life [5, 11]. In the study of Tomic et al., depression and anxiety ratios of the dystonia patients were found to be as 42.1% and 57.9%, respectively [10], whereas Moraru et al. reported that anxiety and major depression ratios were as 40% and 37.5%, respectively [12]. Müller et al. reported that 47% of dystonia patients had depression, whereas this ratio was reported to be 57.3% in the study of Fabbrini et al. [13, 14]. In our study, depression rate was found to be 46.3% in accordance with the literature and high levels of anxiety was found in 26.6% of the patients.

In the study of Pekmezovic et al., pain, depression, and anxiety were found to be the most important factors that affect the daily life activities [6]. These results suggest that the goal in the treatment is not only to eliminate the physical symptoms but also to diagnose and treat the accompanying psychiatric comorbid disorders. The results of our study show that there was a negative effect on the depression-anxiety scale in the patients' spouses when compared to healthy subjects, and some of the quality of life scales were affected negatively (vitality, mental health, and general health perception subscales). To our knowledge, there is only one study in the literature evaluating the relatives of patients by using the SF-36 scale. In this New Zealand and Australia-based study, patients were found to score low on all eight subscales of the SF-36, but caregivers had scores similar to healthy individuals [15]. Unlike our study, this study did not specify the dystonia type. Furthermore, the study was criticized for not reflecting the general public since the patients were obtained from tertiary centers.

Although the number of studies evaluating non-motor findings such as depression in patients undergoing BTX treatment is low, in a study by Wollmer et al. which has investigated the efficacy of BTX in depression treatment, it has been shown that a single treatment of BTX into the glabellar region alleviates the symptoms of depression in patients [16]. They have suggested that the facial musculature not only expresses but also regulates mood states. However, compatible treatment of dynamic glabellar rhytides with botulinum toxin may be considered for depressed patients with the objective of inducing mood-lifting side effects.

Although there is no study in the literature investigating the depression scales before and after BTX treatment in patients with CD, depression and anxiety were reported to be the most important determinants of disability [12]. In our study, it was observed that anxiety scales (STAI-I and II) also showed a statistically significant decrease in performance scores, especially after BTX. It is an expected result that improvement in the anxiety was achieved following BTX treatment which is the most effective treatment method.

The change in disease activity following BTX treatment was investigated by TWSTRS. In a study conducted by Kocaman et al. in nine patients, the subjective improvement rate was found as 55% after BTX treatment while a 13% decrease was observed in TWSTRS and the authors emphasized the low number of patients included in the study [17]. In our study, the number of patients included in the study is bigger and our study revealed a 44.62% decrease in TWSTRS after BTX treatment.

There are only a limited number of studies in the literature investigating the depression-anxiety, and quality of life scales of the relatives of patients before and after the BTX treatment. In this context, we believe that our work will contribute to the literature. The determination of the changes in vitality and mental health subscales of quality of life

Table 6 Depression and anxiety scales of the spouses

Depression BDS	Spouse number (%)	Anxiety HAS?	Spouse number (%)	State anxiety STAI-I	Spouse number (%)	Trait anxiety STAI-II	Spouse number (%)
None	19 (63.3)	None	25 (83.3)	None	18 (60)	None	16 (53.3)
Mild	8 (26.6)			Mild	5 (16.6)	Mild	2 (6.7)
Moderate	2 (6.7)	Severe	5 (16.6)				
Severe	1 (3.3)	anxiety		Severe	7 (23.3)	Severe	12 (40)

Table 7. Quality of life scales of cervical dystonia patients' spouses

Quality of life scales, SF-36 subscales	Mean score
Physical functioning	94.50 ± 14.93 (80.6–87.2)
Role limitations, physical	95.83 ± 13.26 (82.9–89.8)
Role limitations, emotional	96.11 ± 12.13 (89.0–92.8)
Vitality	63.16 ± 17.88 (63.4–65.7)
Mental health	66.13 ± 19.41 (70.1–71.0)
Social functioning	93.33 ± 13.02 (90.1–91.7)
Pain	93.91 ± 12.08 (81.0–85.1)
General health perception	63.43 ± 14.91 (69.1–73.6)

scales before and after BTX treatment suggests that the treatment performed to patients may play a role in decreasing the anxiety and discomfort in the relatives of the patients [18, 19]. The studies performed on the quality of life have reported that age, gender, marital (social support), working and educational statuses, age at the onset of the disease, duration of treatment, and duration of diagnosis may affect the quality of life in a significant manner. Some other studies have also reported conflicting results [4].

Table 8 Comparison of the tests before and after BTX treatment

Tests	Before BTX	After BTX	*p*
Anxiety/depression scales			
Beck Depression Scale	11.13 ± 8.68	9.70 ± 7.90	0.178
STAI-1	40.00 ± 7.68	36.06 ± 8.19	$p = 0.002$
STAI-2	43.76 ± 8.70	40.66 ± 7.97	0.01
HAS	6.90 ± 4.63	5.86 ± 3.22	0.112
HDS	5.73 ± 4.40	4.96 ± 3.63	0.183
Disease activity			
TWSTRS total	34.26 ± 3.28	18.97 ± 3.14	< 0.001
Severity of dystonia	17.86 ± 3.15	11.23 ± 3.53	< 0.001
Impairment	8.53 ± 2.72	3.76 ± 1.99	< 0.001
Pain	7.90 ± 3.99	3.98 ± 3.14	< 0.001
Quality of life			
CDQ-24	46.27 ± 12.71	31.57 ± 8.78	< 0.001
Stigma	58.41 ± 15.19	38.76 ± 10.08	< 0.001
CDIP-58	39.85 ± 8.66	28.72 ± 6.91	< 0.001
SF-36 subscales			
Physical function	51.83 ± 21.91	64.33 ± 19.19	< 0.001
Physical role impairment	32.50 ± 18.74	70.83 ± 19.78	< 0.001
Emotional role impairment	39.99 ± 25.36	68.88 ± 19.44	< 0.001
Energy/vitality	48.00 ± 12.83	60.66 ± 10.14	< 0.001
Mental health	54.80 ± 16.10	64.26 ± 14.01	< 0.001
Socializing	57.08 ± 10.21	74.58 ± 14.02	< 0.001
Pain	62.08 ± 12.63	77.66 ± 8.38	< 0.001
General health perception	42.45 ± 10.79	48.46 ± 10.34	< 0.001

Table 9 Comparison of the tests in spouses before and after BTX treatment

Tests	Before BTX	After BTX	*p*
Anxiety/depression scales			
Beck Depression Scale	8.63 ± 7.58	7.16 ± 5.41	0.054
STAI-1	35.83 ± 7.53	32.30 ± 7.55	0.001
STAI-2	38.90 ± 9.33	37.76 ± 8.36	0.513
HAS	5.63 ± 3.83	5.00 ± 3.22	0.206
HDS	5.10 ± 3.69	4.20 ± 3.56	0.071
Quality of life			
SF-36 subscales			
Physical function	94.50 ± 14.93	94.50 ± 14.93	1.000
Physical role impairment	95.83 ± 13.26	95.83 ± 13.26	1.000
Emotional role impairment	96.11 ± 12.13	98.33 ± 9.12	0.161
Energy/vitality	63.16 ± 17.88	71.41 ± 17.36	$p < 0.001$
Mental health	66.13 ± 19.41	71.86 ± 16.59	$p < 0.001$
Socializing	93.33 ± 13.02	95.00 ± 9.04	0.161
Pain	93.91 ± 12.08	94.66 ± 9.32	0.326
General health perception	63.43 ± 14.91	63.84 ± 14.71	0.338

Pekmezovic et al. found no correlation between gender, education level, employment, marital status, and the SF-36 subscales in their study including 157 patients with all types of focal dystonias [6]. Similarly, Ben-Sholmo et al. have not found any correlation between the worsening of quality of life and gender, age, educational level, and social functioning [5]. When we examined the role of gender in treatment efficacy in our study, it was observed that the improvement in depression anxiety in male patients was statistically more significant.

In a UK-based meta-analysis on disease severity, it was reported that there was no correlation between gender and dystonia severity [20]. Similar to the findings in literature, TWSTRS total scores were found to be similar both for males and females in our study. However, improvement in disease activity and quality of life after the BTX treatment were found to be statistically more significant in females. In this regard, we think that lower scores in physical and mental fields of females may have played a role.

In the study of Slawek et al. on social support, it was reported that a reduction in social functioning in SF-36 was observed in patients who did not receive any social support [10]. Ben-Shlomo et al. reported better scores on the physical and mental subscales in patients receiving social support [9]. Similar to the literature, we observed lower scores in depression-anxiety in married patients and the improvement in depression-anxiety and quality-of-life scales after BTX treatment were found to be statistically more significant in married patients.

In the study of Queiroz et al., which has investigated the duration of treatment, it was reported that a poor correlation between treatment duration and all subscales of SF-36 was

observed [4]. In our study, we found that depression and anxiety levels were higher in patients who were on BTX treatment less than 5 years. Similar results were obtained in terms of disease activity and quality of life. The lower results obtained for depression and anxiety scales in patients receiving BTX treatment longer than 5 years were attributed to the process of accepting and adaptation to the disease.

In conclusion, this is a study that investigates the effect of different factors on the quality of life, showing the effectiveness of BTX on scales, including cervical dystonia patients and their spouses unlike previous studies. Since cervical dystonia is accompanied by psychiatric comorbid disorders, it can affect the quality of life and can have a delayed diagnosis, so the clinicians should include this disease in the differential diagnosis for being able to start the effective treatment to the right patient at the right time.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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