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A reliable source of information on botulinum toxin injection used in the treatment of spasticity: YouTube

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ABSTRACT

Aim: The aim of the study is to assess the quality and reliability of YouTube videos on botulinum toxin injection for the treatment of spasticity.

Material and Method: In this cross-sectional study, a search of YouTube videos was made on 15 September 2020, using the keywords "botulinum toxin and spasticity", "botulinum toxin treatment for spasticity", "spasticity management with botulinum toxin" "treating spasticity with botox". Two experienced reviewers on botulinum toxin injection on spasticity reviewed the first 200 videos. The quality of the videos was evaluated according to the Global Quality Scale (GQS) and three groups were formed: high quality, intermediate quality and low quality. The DISCERN tool was used to evaluate the reliability of the videos.

Results: Of the 77 videos analyzed according to GQS, 36 (46.8%) were high quality, 31 (40.2%) were intermediate quality and 10 (13.0%) were low quality. Most of the videos (44.15%, n=34) uploaded by health professionals (physiatrist, orthopedist etc.) and the majority of the health professional groups had produced high quality videos (67.64%). When the parameters of the videos were compared according to quality levels, no significant differences were found in the number of view, comment, likes, dislikes, video length, days since upload ($p>0.05$). Significant differences were only found between the groups in respect of the DISCERN scores ($p<0.001$).

Conclusion: YouTube can be considered as a reliable source for botulinum toxin injection in spasticity. The importance of the video source should be explained to the patient and healthcare professional using YouTube.

Keywords: YouTube, botulinum toxin, spasticity

INTRODUCTION

Spasticity is a motor disorder characterized by the velocity-dependent increase in tonic stretching reflexes and increased tendon responses due to the hyperexcitability of stretching reflexes (1). It is one of the complications that occur as a result of upper motor neuron lesion. Although the pathophysiology of spasticity is complex, it occurs as a result of the hyperexcitability of spinal motor neurons in the damage of the inhibitory system, which starts from the cortex and extends to the spinal cord and ensures the control of spinal reflexes and maintains the normal tone in the muscles (2). Although the beneficial effects of spasticity such as standing upright positioning and protecting bone mass are known, it has negative effects on functional recovery in many cases. It should be treated if it restricts functional movements, affects daily life activities and hygiene care, and causes contractures (3).

Posture and positioning, stretching and strengthening exercises and orthosis are used in the non-pharmacological treatment of spasticity. In addition, superficial and deep heaters, cryotherapy and some electrotherapy agents are other non-pharmacological treatment options. Pharmacologically, oral anti-spastic agents, intrathecal applications and motor point and nerve blocks are used in the treatment (4). Botulinum toxin is a potent neurotoxin produced by clostridium botulinum. It binds to presynaptic cholinergic nerve endings at the neuromuscular junction and blocks muscle contraction by preventing acetylcholine release into the intersynaptic area. Many studies have shown that botulinum toxin administration is effective and safe in spasticity treatment (5).

YouTube is an internet platform that is frequently used to obtain health-related information. Although there is information on the diagnosis and treatment of many

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diseases on this platform, the accuracy of the videos or the educational quality of the videos are questioned, as anyone can easily upload a video and there is no quality control mechanism. Therefore, there are studies in the literature questioning the reliability of YouTube videos in different disease groups (6-9).

The objective of this study is to evaluate the quality and reliability of YouTube videos on botulinum toxin injection for the treatment of spasticity to determine if it is a reliable resource for the people.

MATERIAL AND METOD

Ethics Statement

Ethics Committee approval was not required for this study because videos are publicly available on YouTube and there were no human or animal participants in the study. Similarly, Ethics Committee approval was not obtained in other studies that evaluated YouTube videos (13-15). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Study Design

A search was made of videos on YouTube (www.youtube.com) on 15 September 2020, using the keywords "botulinum toxin and spasticity", "botulinum toxin treatment for spasticity", "spasticity management with botulinum toxin" "treating spasticity with botox". It has been shown that many YouTube users watched the first 60-200 videos after searching (10). In present study, two experienced reviewers on botulinum toxin injection on spasticity reviewed the first 200 videos. The reviewers who evaluated the quality of the videos did not have any information about the video's number of likes, dislikes, views and comments in order not to affect the assessment. In cases where there was disagreement between reviewers in terms of evaluation and scoring, a consensus was achieved by conducting detailed literature research and discussion. Non-English videos, duplicate videos, videos about botulinum toxin injection in different diseases (bruxism, wrinkles, headache etc.) and off-topic videos were excluded in the study. After the exclusion, a total of 77 videos were analyzed.

Video Assessment

The source of the video, number of likes and dislikes, number of comments, number of views, video length and upload day to YouTube of all videos were recorded. Sources of the video were divided into five categories: 1.health professionals, 2 independent users, 3. independent users with health, 4.PhD/anatomist/physiotherapist, 5.TV/magazine media. The target audiences of the videos were divided into four categories: 1.patients, 2.health professionals, 3.both patients and health professionals, 4.everybody. Videos containing general information about the indications and complications of botulinum toxin injection were included in the first group, videos with detailed information such as the location, dosage, anatomy of the injection and which patients should be applied were included in the second group, and videos that provided both general and detailed information were included in the third group. Videos containing superficial information not teaching botulinum toxin application were included in the fourth group.

The quality of all videos was evaluated with the Global Quality Scale (GQS). The GQS is a 5-point Likert scale developed for internet research, with scores ranging from 1 to 5.A score of 1 or 2 indicates a low-quality video, 3 points indicate intermediate quality, and a score of 4 or 5, high quality (11). To evaluate the reliability of the videos DISCERN tool that consisting of 5 yes-no questions and each question is one point (maximum 5 points), was used (12). This GQS and DISCERN tool is used in studies where many YouTube videos are examined in educational terms.

Statistical Analysis

Data obtained in the study were analyzed statistically using SPSS for Windows 22.0 software. Inter-observer agreement was calculated as the kappa score. The conformity of numerical variables to normal distribution was assessed with the Shapiro Wilk test. In the comparisons of 3 or more groups of variables not showing normal distribution, the Kruskal-Wallis and Dunn tests were applied. A value of $p<0.05$ was considered statistically significant.

RESULTS

Of the 200 videos examined by the researchers, 91 duplicated videos, 28 off-topic videos, and 4 non-English languages videos were excluded from the study. Thus analysis was made of 77 videos. The mean GQS score of the videos was 3.65 ± 1.04, the mean DISCERN score was 3.50 ± 1.20. Video length, days since upload, likes, dislikes, number of views, number of comments data are shown in **Table 1**. In terms of target audience, more than half of the videos (53.2%, n = 41) were in the patient group, 14 (18.2%) were in the health professionals group, 10 (13.0%) were both patients and health professional group, and 12 (15.6%) were in the study population group.

When the 77 videos were analyzed according to GQS, 36 (46.8%) were high quality, 31 (40.2%) were intermediate quality and 10 (13.0%) were low quality. Most of the videos (44.15%, n=34) were uploaded by health professionals (physiatrist, orthopedist etc.), whereas 9.09% (n=7) were uploaded by independent users, 19.48% (n=15) were uploaded by independent users with an accompanying health professional, 12.98% (n=10) were uploaded by PhD/anatomist/physiotherapist and

Table 1. General features of the videos

	n	Mean	Std. Deviation	Minimum	Maximum
Video duration (second)	77	386.45	497.04	38.00	4213.00
Days since upload_(date)	77	1731.61	1080.49	56.00	3812.00
Likes	77	56.94	126.89	.00	903.00
Dislikes	77	4.26	13.90	.00	116.00
Number of comments	63	5.71	11.64	.00	72.00
View	77	3238.56	32.004	2.00	229494,00

14.28% (n=11) were uploaded by TV/magazine media. While the majority of the health professional groups had produced high quality videos (67.64%), the rate of high quality videos in the other groups was between 28.6% and 36.4% (**Table 2**). There was no statistically significant difference between the groups in terms of likes, dislikes, number of views, video length, days since upload, number of comments, comments per day, or views per day.

When the parameters of the videos were compared according to the quality levels, no significant differences were found in the likes, dislikes, number of views, video length, days since upload, number of comments, comments per day, or views per day ($p>0.05$). Significant differences were only found between the groups in respect of the DISCERN scores and ($p<0.001$). The kappa score, which shows the interreviewer agreement, was determined as 0.85.

Table 2. Categorization of the videos according to sources, n (%)

	Low quality	Intermediate quality	High quality	Total
Health professionals	3 (8.8)	8 (23.5)	23 (67.64)	34
Independent users	1 (14.3)	4 (57.1)	2 (28.6)	7
Independent users with health	3 (20.0)	8 (53.3)	4 (26.7)	15
PhD/anatomist/ physiotherapi st	1 (10,0)	6 (60,0)	3 (30,0)	10
TV/magazine media	2 (18.2)	5 (45.5)	4 (36.4)	11

n number, % percentage

DISCUSSION

Botulinum toxin injection is a method commonly used in the treatment of spasticity in upper motor neuron injury diseases such as stroke, spinal cord injury, traumatic brain injury, and multiple sclerosis. Although YouTube has been used for many different purposes since its creation, in recent years it has been used by both healthcare professionals and patients for medical information. The aim of the study was to evaluate the quality and reliability of botulinum toxin injection videos on spasticity on YouTube. It was observed that some of the videos evaluated were addressed to healthcare professionals, some to the patient population, and some to both groups. When the video quality was examined, it was seen that 87% of the videos were high and intermediate quality. When evaluated as a video source, it was observed that health professionals had a higher reliability.

The videos investigated in present study had over 1 million views, with an average 13238 views per video, demonstrating that botulinum toxin videos are widely available on YouTube. Moreover, the videos garnered total 439 comments and 4381 likes from users, reflecting both the active input and support form YouTube users. That's why the videos on such a frequently used platform should have the correct information and quality. The high rate of high quality video shows that people have reached the right information on this subject. There are conflicting results in studies evaluating the quality of YouTube videos in the literature. While some studies have concluded that the quality of the videos on the related subject is high (16,17), others have concluded that the video quality is low (18). In the present study, 36 (46.9%) were high quality, 31 (40.2%) were intermediate quality and 10 (13.0%) were low quality according to the GQS.

Botulinum toxin injections are also used for aesthetic and non-aesthetic (cervical dystonia, headache, sialorrhea, temporomandibular joint disorders, bruxism) purposes other than spasticity (19). However, there are only two studies evaluating the quality of YouTube videos in the literature on this subject. First, Wong et al examined botulinum toxin injection videos used for wrinkles and stated that these videos had high-quality content and YouTube was a useful resource for patients (20). In the other study, Gaş et al. (21) evaluated botulinum toxin injection videos for bruxism and concluded that YouTube is a reliable source in this field. Similarly, in this study, it was concluded that YouTube videos on spasticity are a reliable source for both patients and healthcare professionals.

When examined as a video source in present study; although the video quality was better in the health professionals group, it was observed that there was no difference between the groups in terms of views, likes, dislikes, number of comments. This means that YouTube users are interested in videos regardless of source. Similarly, previous studies assessing the quality of videos on YouTube have demonstrated that the videos produced

by healthcare professionals were of higher quality (6). The fact that nearly half of the videos examined in present study were uploaded by qualified health professional supports that they are both reliable and valuable.

The study has several limitations. First, as in all studies YouTube videos are evaluated, the results of the study depend on the day of the research, due to the dynamic structure of YouTube. Second, the scales used in the study are subjective and therefore results depend on the person evaluating it. Third, we evaluated only English-language videos but botulinum toxin injection is also popular in non-English speaking countries.

CONCLUSION

YouTube contains reliable and educational information about botulinum toxin injection used in the treatment of spasticity. In particular, the qualities of videos uploaded by the health professional are higher than others. Therefore health professionals should be encouraged to make and upload more videos for educational purposes.

ETHICAL DECLARATIONS

Ethics Committee Approval: Ethics Committee approval was not required for this study because videos are publicly available on YouTube and there were no human or animal participants in the study. Similarly, Ethics Committee approval was not obtained in other studies that evaluated YouTube videos (13-15).

Referee Evaluation Process: Externally peer-reviewed.

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REFERENCES

1. Lance JW, Feldman RG, Young RR, Koella WP. Spasticity: disorder of motor control. Chicago, IL: Year Book Medical; 1980, p. 485-94.
2. Sheean G. Neurophysiology of spasticity. In Barnes MP, Johnson GR (Eds): Upper Motor Neurone Syndrome and Spasticity. Cambridge, Cambridge University Press, 2008, p. 9-68.
3. Zorowitz RD, Gillard PJ, Brainin M. Poststroke spasticity: sequelae and burden on stroke survivors and caregivers. Neurology 2013; 80: S45-52.
4. Leo A, Naro A, Molonia F, et al. Spasticity Management: The Current State of Transcranial Neuromodulation. PMR 2017; 9: 1020-9.
5. Brin MF, Aoki KR. Botulinum toxin type A: pharmacology. Spasticity, Etiology, Evaluation, Management and the Role of Botulinum Toxin 2002: 110-24.
6. Kocyiğit BF, Nacitarhan V, Koca TT, Berk E. YouTube as a source of patient information for ankylosing spondylitis exercises. Clin Rheumatol 2019; 38: 1747-51.
7. Lee TH, Kim SE, Park KS, et al. Medical Professionals' Review of YouTube Videos Pertaining to Exercises for the Constipation Relief. Korean J Gastroenterol 2018; 72: 295-303.
8. Villafane JH, Tellez RC, Valdes K, Usuelli FG, Berjano P. Educational Quality of YouTube Videos in Thumb Exercises for Carpometacarpal Osteoarthritis: A Search on Current Practice. Hand (NY) 2018; 13: 715-9.
9. Stephen K, Cumming GP. Searching for pelvic floor muscle exercises on YouTube: what individuals may find and where this might fit with health service programmes to promote continence. Menopause Int 2012; 18: 110-5.
10. Hegarty R, Campbell C, Grammatopoulos E. YouTube as an information resource for orthognathic surgery. J Orthod 2017: 44; 90.
11. Bernard A, Langille M, Hughes S, Rose C, Leddin D, Veldhuyzen van Zanten S. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. Am J Gastroenterol 2007; 102: 2070–7 .
12. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. J Epidemiol Community Health 1999; 53: 105-111.
13. Tolu S, Yurdakul OV, Basaran B, Rezvani A. Englishlanguage videos on YouTube as a source of information on selfadminister subcutaneous antitumour necrosis factor agent injections. Rheumatol Int 2018; 38: 1285–92.
14. Nason GJ, Kelly P, Kelly ME, et al. YouTube as an educational tool regarding male urethral catheterization. Scand J Urol 2015; 49: 189–92.
15. Esen E, Aslan M, Sonbahar BÇ, Kerimoğlu RS. YouTube English videos as a source of information on breast self-examination. Breast Cancer Res Treat 2019; 173: 629–35.
16. Singh AG, Singh S, Singh PP. YouTube for information on rheumatoid arthritis—a wakeup call? J Rheumatol 2012; 39: 899–903.
17. Garg N, Venkatraman A, Pandey A, Kumar N. YouTube as a source of information on dialysis: a content analysis. Nephrology (Carlton) 2015; 20: 315–20.
18. Erdem H, Sisik A. The reliability of bariatric surgery videos in YouTube platform. Obes Surg 2018; 28: 712–6.
19. Persaud R, Garas G, Silva S. An evidence-based review of botulinum toxin applications in non-cosmetic head and neck conditions. JRSM Short Rep 2013: 4; 10.
20. Wong K, Doong J, Trang T, Joo S, Chien AL. YouTube videos on botulinum toxin A for wrinkles: A useful Resource for patient education. Dermatol Surg 2017: 43; 1466.
21. Gaş S, Zincir ÖÖ, Bozkurt AP. Are YouTubevideos useful fır patients interested in botulinum toxin for bruxism. J Oral Maxillofac Surg 2019: 77: 1776-83.