Journal of Psychiatry
ISSN: 2378-5756

Mikellides et al., J Psychiatry 2018, 21:5
DOI: 10.4172/2378-5756.1000458

Case Report Open Access

rTMS for Migraine with a Generalised Anxiety Disorder-A Combination Treatment with Duloxetine

Georgios Mikellides[1]*, Marianna Tantele[2] and Olympia Evagorou[3]

[1]*Faculty of Psychology and Neuroscience & Maastricht Brain Imaging Centre, Maastricht University, Netherlands*
[2]*Faculty of Medicine, University of Nicosia, Cyprus*
[3]*Department of Psychiatry, Democritus University, Greece*

Abstract

This is an interesting case of a patient and his care pathway that followed his management at Cyprus rTMS centre. The patient was experiencing daily episodes of migraines for 18 months and did not respond to a number of medications when tried by different neurologists. He was also experiencing intense level of anxiety in his daily activities affecting his functionality, leading to disability. The case of a 30-year-old Greek Cypriot man is discussed, as this case raises important issues and highlights the difficulties of offering treatment to patients with migraines as migraines if combined with an anxiety disorder could be very difficult to treat and could appear as treatment resistant to a number of medications. Our clinical question was whether the presence of anxiety disorder played a role in the resistance of the disease to the treatment, and whether this disturbance exacerbated the nature of its migraines. This case highlights the importance that for some patients a combination of an antidepressant with rTMS could help a patient reach a substantially improved quality of life and return to his previous mental and physical state.

Keywords: rTMS; Migraine; Anxiety; Duloxetine

Introduction

Repetitive Transcranial Magnetic Stimulation (rTMS) is a non-invasive neuromodulation treatment that involves the induction of electrical currents in a targeted region of the brain, which efficaciously treats a variety of pathological conditions and diseases [1,2]. Migraines are intense headaches recurrent in nature and could be considered as a primary disorder [3], leading to neurological disability [4]. It has been suggested that approximately 1% of the world's population may suffer from chronic migraine [5,6]. Usually these headaches are unilateral presenting as throbbing with moderate to severe intensity [7], in most cases alongside with symptoms such as nausea and vomiting, dizziness, photosensitivity, phonophobia, lack of appetite and disturbances of bowel function (4). It's believed that could be neurovascular in terms of its origin [8] and that anxiety can trigger the onset as well as increase the frequency of a migraine attack [9,10]. Low levels of serotonin have been also implicated in terms of understanding the pathophysiology of this disorder [11].

Different medications have been tried to be used for treatment such as non-steroidal anti-inflammatory drugs or a combination of paracetamol with aspirin and caffeine [12]. Topiramate, sodium valproate, propranolol and metoprolol are also reported in literature as having the best of evidence and can be used as a first-line treatment [13], but even these could only reduce the severity and frequency of the migraines attacks by at least 50% [14].

Case Report

A previously healthy 30-years old patient attended our psychiatric clinic for examination after the occurrence of migraines in the past 18 months, who did not respond to a number of medications. During this period, the patient reported that he had visited 27 neurologists and received at least 22 different medications, with no results. From the previous medication, all he remembered was topiramate. The patient was experiencing daily intense episodes of severe migraines with tendency to vomit, which affected his functionality to a great extent as he could not work or respond to his obligations and his daily activities. On examination, it was found that the patient apart from the migraines, fulfilled the clinical criteria for generalized anxiety disorder, according to ICD-10, which he did not received appropriate treatment and also affected his daily activities to a great extend causing also a major disability.

Management

Our clinical question was whether the presence of anxiety disorder played a role in the resistance of the disease to the treatment, and whether this disturbance exacerbated the nature of its migraines. For this reason, and due to the reported resistance to previous medications, we decided to treat the patient with a combination of an antidepressant drug and rTMS. He was initiated on duloxetine 30 mg and within a week this was titrated to 60mg daily and subsequently to 90mg. At the same time, the patient gave an informed consent. He was treated with MagVenture- Mag pro X100 Magnetic Stimulator system, 230V for TMS under the supervision of a psychiatrist trained in implementation of rTMS, and he completed nine sessions (3 sessions per week for 3 weeks in total). In this case, we followed the protocol as described below: (Figure 1).

Step 1: 68 HZ, 140 pulses/train

9 trains, 2s ITI 20% machine intensity

Step 2: 68 HZ, 15 pulses/train

33 trains 10 ITI

***Corresponding author:** Georgios Mikellides, PhD Researcher, Faculty of Psychology and Neuroscience & Maastricht Brain Imaging Centre, Maastricht University, Netherlands, Tel: + 0035799430330; E-mail: george.mikellides@gmail.com

Received: September 20, 2018; **Accepted:** October 05, 2018; **Published:** October 12, 2018

Citation: Mikellides G, Tantele M, Evagorou O (2018) rTMS for Migraine with a Generalised Anxiety Disorder-A Combination Treatment with Duloxetine. J Psychiatry 21: 458. doi:10.4172/2378-5756.1000458

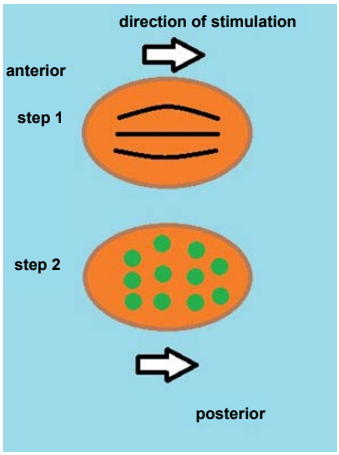

Figure 1: Direction of Stimulation.

80% MT

Step 3: neck, chest, upper back

10 pulses/train,11 trains/frequency 2s ITI

at intervals of 5HZ-10HZ -5HZ-10HZ-5HZ

Results

Following the completion of the first three sessions, the patient had already begun to feel much better, with the episodes and intensity of migraines to gradually reduce. From the second week of treatment, his anxiety levels were also reduced and gradually subside. As a result, he did not experience any relapse of migraines for a month and he was able to return to his work and to his daily activities. After the end of the rTMS sessions, he continued to receive the antidepressant for his anxiety disorder. He continued to be able to work and function in his life with the attacks being seldomly presenting in the subsequent months with a much less intensity 1-2 attacks of migraine per month.

Discussion

Literature has proved a clear efficacy of rTMS for the treatment of anxiety disorders [15-17]. It has been also shown that rTMS has positive effects on preventive and treatment not only of migraine but also of co-morbid conditions, such as depression [18,19]. Although the literature mainly mentions the use of rTMS as a prevention mechanism of migraine attacks [20], in our case it has been effective in a case of drug-resistant migraine with anxiety syndrome, when combined with antidepressant therapy. The limitation of this study lies in the short period of time in which the patient remained free of symptoms. Further observation is required to consider that the patient has been completely cured and if further rTMS sessions would be required. However, we cannot overlook the clear improvement in his functionality. It seems that in the present case, the co-morbidity of migraine with the generalized anxiety disorder may have worsened the patient's migraine headaches both in frequency and intensity. It is likely that non-treatment of anxiety disorder in previous therapeutic interventions, prevented migraine withdrawal. Further investigations should be made in incidents with both other anxiety disorders or without anxiety disorder, in combination with rTMS with antidepressant and anxiolytic therapy, to make sure that this combination can be used effectively to treat migraine.

Conclusion

This case highlights the use of rTMS treatment for comorbidity of migraines and anxiety disorders. The combination of duloxetine with rTMS enabled a person with severe migraines and anxiety disorder, who was initially unable to function for a long period of time, to return to his work and to his daily activities. rTMS could be used to treat patients in the acute phase of a migraine and also to act as preventing mechanism for them perhaps through a neuromodulation of the brain activity.

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