



Clinical Report

Effects of Selective Seratonine Re-Uptake Inhibitors on Meniere's Disease

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OBJECTIVE: To evaluate the effects of selective serotonin re-uptake inhibitors (SSRIs) on Meniere's disease (MD) on patients who have both MD and generalized anxiety disorder.

MATERIALS and METHODS: All patients were evaluated with neurotologic examination, videonystagmography, audiological tests, and inner ear magnetic resonance imaging. Characteristic history and the evaluation of the patients' vertigo attacks during the attacks were the primary criteria for the diagnosis of MD. According to these parameters, 12 patients were diagnosed with definite MD and also symptoms of generalized anxiety disorder. Escitalopram 10 mg was prescribed to the patients. The clinical records of these patients were reviewed.

RESULTS: Eight female and 4 male patients with MD and generalized anxiety disorder were included. The average age was found to be 46.25 years (34-63 years). Magnetic resonance imaging of patients was reported as normal. All patients had unilateral MD. The patients were diagnosed with MD for 2-12 years (mean: 5 years). All patients used betahistine and diuretics before escitalopram. Intratympanic gentamicin was also applied to one patient. After escitalopram medication, no vertigo attack was observed in any of the patients.

CONCLUSION: SSRIs may have a central balancing effect on vertigo attacks of MD. Escitalopram can control vertigo attacks in MD. Further studies are needed to support this effect.

KEYWORDS: Dizziness, Meniere's disease, serotonin, serotonin re-uptake inhibitors

INTRODUCTION

Pathogenesis of the Meniere's disease (MD) is still unclear and there is no particular treatment directed to the etiology of this disease ^[1,2].

Many medical treatment options are available for MD, which include benzodiazepines, betahistine, diuretics, steroids, and even antidepressants.

Selective serotonin re-uptake inhibitors (SSRIs) have been used for treatment of anxiety and depression ^[3]. SSRIs have many advantages including good tolerability, easy prescription, and low complication rates. It has been reported that SSRIs improved dizziness in patients with different psychiatric symptoms, including peripheral vestibular symptoms and migraine headaches ^[4].

There are case reports on the beneficial effects of SSRIs on MD. In one of these reports, it is speculated that SSRIs may have treated associated morbidity such as migraine-associated vertigo or associated panic disease but not MD itself. Vertigo attacks were improved by the application of sertraline on patients with MD ^[5].

Our aim was to evaluate the effects of SSRIs on patients who have both MD and generalized anxiety disorder. The high control rates of real Meniere's attacks in our series suggest that SSRIs might have a direct effect on the vestibular system and its central connections besides controlling the associated panic disorder.

MATERIALS and METHODS

This study was performed at the Department of Otorhinolaryngology, School of Medicine, University of Çukurova University between January 2012 and January 2014. This study was certified by the local ethics committee of the University of Çukurova. Patients

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Table 1. Summary of patients who used SSRIs

Number	Age	Gender	Duration of the diagnosis (years)	Duration of the SSRI usage (months)	Affected ear	Number of attacks (before treatment)	Number of attacks (after treatment)
1	59	F	3	18	Right	Twice/year	0
2	41	M	5	24	Left	Three times/year	0
3	40	M	3	12	Right	Four times/year	0
4	63	F	10	24	Right	Two times/year	0
5	34	F	2	12	Left	Three times/year	0
6	43	M	5	24	Left	Once/year	0
7	46	F	3	12	Right	3 times/year	0
8	56	M	12	24	Left	6 times/year	0
9	39	F	4	24	Right	Twice/year	0
10	51	F	6	24	Right	3 times/year	0
11	48	F	4	24	Left	3 times/year	0
12	35	F	3	12	Left	5 times/year	0

F: female; M: male; SSRI: selective serotonin re-uptake inhibitors

were evaluated with neurotologic examination, videonystagmography, audiological tests, and inner ear magnetic resonance imaging. Characteristic history and the evaluation of patients' vertigo attacks during the attacks were considered sufficient for diagnosis of the disease. According to these parameters, 12 patients were diagnosed with definite MD with symptoms of generalized anxiety disorder. We reviewed the clinical records of these 12 patients. All patients were consulted by the psychiatry department, and the diagnosis was confirmed. Escitalopram 10 mg was prescribed to the patients (10 mg/day for a minimum of 12 months and a maximum of 24 months). Previous treatments of the patients were noted. Patients who did not benefit from previous treatments were evaluated for this study. Only escitalopram was applied to all patients. Patient histories of vertigo attacks were noted before and after the treatment. Frequencies of vertigo attacks were compared with the pretreatment data.

RESULTS

This case series involved the analysis of patients who had both MD and generalized anxiety disorder. Eight female and 4 male patients with MD and generalized anxiety disorder were included. The average age was found to be 46.25 years (34–63 years). Magnetic resonance imaging of the patients was reported as normal. All patients had unilateral MD. The patients were diagnosed with MD for 2–12 years (mean: 5 years). Betahistine and diuretics were applied to all patients before escitalopram treatment (betahistine 48 mg/day and acetazolamide 250 mg/day). Intratympanic gentamicin was also applied to one patient. After escitalopram medication, no vertigo attacks were observed in any of the patients. One patient (no. 6) had four sensorineural hearing loss attacks without vertigo. He reported aural symptoms very similar to the Meniere's attacks that he had before escitalopram treatment with exception of vertigo.

The follow-up period and mean SSRI usage period was 23.5 months (12–36 months). The summary of the patients is listed at Table 1.

DISCUSSION

Etiopathology of MD is still unclear. Immune, metabolic, traumatic, infectious, or other damage to the inner ear can cause MD. The disease is mostly associated with a small incorrectly positioned and dysfunctional

endolymphatic sac^[6,7]. Immune-mediated responses of the endo-organs such as the endolymphatic sac, stria vascularis, and spiral ligament are thought to be associated with the development of symptoms in MD^[8–11]. There are many available treatment options for this disease.

Psychological stress can play a major role in the early stage and progression of this disease. Only a few reports exist concerning the implementation of autogenic training and behavior therapy to patients with vertigo^[12]. A report of Goto et al. showed that autogenic training and cognitive behavior therapy could be an effective and acceptable treatment approach for patients with MD who do not respond to other therapies^[13].

Antidepressants were used for the treatment of the chronic subjective symptoms such as dizziness with anxiety and psychiatric comorbidity. It was reported that SSRIs relieved migraine headache and dizziness in patients with minor and major psychiatric symptoms^[4]. Staab et al.^[4] reported that sertraline significantly improved chronic subjective dizziness symptoms in patients without active physical neurotologic illness, including those with and without psychiatric comorbidity.

There are two reports on efficacy of the SSRIs on MD. All three patients' vertigo attacks were completely improved by the implementation of sertraline in one of these reports^[5]. The positive effects of SSRIs in patients with MD were also reported by Overton^[14].

Serotonin may change the reactions of motion-sensitive neurons in the vestibular nuclei, inferior olive, and midline cerebellar nuclei^[15,16]. Serotonin also regulates neural activity in the central nucleus of the amygdala, which is reciprocally connected to the central vestibular nuclei and autonomic centers in the brainstem^[17]. These findings suggest that any drug that affects serotonin levels, including SSRIs, can change vertigo and balance complaints of patients.

Case no. 6 in our study had four sensorineural hearing loss attacks without vertigo and reported aural symptoms very similar to the Meniere's attacks that he had before escitalopram treatment. This supports the idea that SSRIs can affect the area between the peripheral vestibular endo-organ and central pathways. Possibly the endo-organ of this pa-

tient still has endolymphatic hydrops attacks (sensorineural hearing loss attacks), but escitalopram prevents the disequilibrium between two central vestibular inputs, which can lead to vertigo.

In this study, following SSRI (escitalopram) medication, none of the patients had vertigo attacks. This result may be due to serotonin modulation as mentioned above or some other mechanisms including histaminergic receptors. We have shown that high-dose betahistine increases caloric-induced slow-phase velocity in humans¹⁸. Accordingly, SSRIs may have a similar effect on histaminergic receptors, and this effect can be the cause of the advantageous effect on MD.

In conclusion, escitalopram seems to be a potent drug that controls vertigo attacks in MD. The mechanism of this treatment protocol is unknown, but the drug's central effects on the levels of serotonin or histamine may change the reactions of motion-sensitive neurons in the vestibular nuclei, inferior olive, and midline cerebellar nuclei and autonomic centers in the brainstem, which can lead to the control of vertigo attacks in MD. Further research and reports are needed to support this effect.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Çukurova University.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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