CASE REPORT

STRESS-INDUCED BELLY DANCER'S DYSKINESIA IN A YOUNG WOMAN: A RARE CASE REPORT

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Abstract

Background: Belly dancer's dyskinesia (BDD) is a movement disorder characterized by involuntary and slow writhing, rhythmic contractions of the abdomen. This rarely encountered phenomenon has not been sufficiently explored, with limited evidence regarding its exact pathophysiology, etiology, and treatment. We present a rare case of stress-induced BDD in a 30-year-old female.

Case summary: A 30-year-old female presented with a 2-month history of involuntary abdominal movements that were sudden in onset, approximately lasting 5-10 minutes, with preserved consciousness. Her symptoms were initially precipitated by stress. However, they worsened within the past week during her menstrual period. Past medical history was significant for long-standing anxiety disorder and depression, for which she took vortioxetine 10mg/day, clonazepam 0.75mg/day, and lorazepam 0.5mg/day routinely. Upon examination, undulating and continuous movements of the abdominal wall were observed. A diagnosis of BDD was made and the patient was treated with an increased dose of clonazepam 1mg/day. Her symptoms significantly improved within three days.

Discussion: Aside from an underlying psychogenic factor, our patient did not have other risk factors for BDD, such as exposure to neuroleptics or history of abdominal trauma. Although certain drugs have been reported to induce BDD, the medications she took have never been reported to cause this condition. Thus, it is most likely that her dyskinesia was stress-induced.

Conclusion: Clinicians may not be familiar with BDD due to its infrequency, and the lack of standardized diagnostic and management strategies makes it challenging to diagnose and treat. Therefore, further research and exposure to BDD are imperative.

Keywords: dyskinesia, belly dancer's dyskinesia, movement disorder.

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Introduction

Belly dancer's dyskinesia (BDD) is a rare movement disorder which manifests as dyskinetic, involuntary, and frequently rhythmic contractions of the anterior abdominal muscles, resembling a belly dance. These contractions may present variably but have been described as mostly bilateral with slow writhing patterns similar to athetosis, often causing abdominal and/or chest pain and dyspnea.[1,2] BDD involves the contraction of multiple

muscles of the abdomen, including the rectus abdominis, internal and external obliques, transverse abdominis, pectoralis major, and perineum muscles.[3]

Numerous etiologies may cause this condition, including abdominal trauma and several known medications. Although the underlying mechanism remains unclear, it is thought to result from the dysfunction of inhibitory spinal interneurons or from structural changes in local neuronal circuits.[4] Studies have shown an association between the effect of hormonal changes during the menstrual period on patients with movement disorders, such as Parkinson's disease and dystonia.[5] However, this possible association remains inadequately explored, especially in BDD patients. We report a rare case of menstrual-related exacerbation of BDD in a 30-year-old female.

Case Presentation

A 30-year-old female presented with a 2-month history of episodic, involuntary abdominal movements. The movements were sudden in onset and generalized, but mainly involved her abdomen. They were painless and lasted approximately 5-10 minutes with preserved consciousness. Her symptoms were initially precipitated by stress and subsided during sleep. However, she noticed these movements worsened in the past week during her menstrual period. She did not have a previous history of pregnancy, trauma nor surgical procedures of the abdomen. The patient had a history of anxiety disorder and depression, and routinely took vortioxetine 10 mg/day, clonazepam 0.75 mg/day, and lorazepam 0.5 mg/day.

Vital signs were stable. Upon examination, there were involuntary, continuous, and undulating abdominal movements. On supine position, these movements were more visible, with notable suppression observed during breath-holding. Neurological examination did not reveal any deficits. An electroencephalogram (EEG) was conducted to rule out seizures, which revealed unremarkable results. Other diagnostics such as MRI of the brain and spine, abdominal fluoroscopy, and electromyography (EMG) were not conducted. She was diagnosed with belly dancer's dyskinesia (BDD) and was put on an increased dose of clonazepam 1mg/day. She was also advised to halt the consumption of vortioxetine. Upon the next follow-up after one week, she reported improvement of symptoms within three days. She was provided with clonazepam 2mg/day only to be taken in case of recurrence.

Discussion

The diagnosis of BDD is primarily clinical but may be supported by diagnostic modalities, such as fluoroscopy and electromyography (EMG) of the diaphragm.[1,9] Further investigation with brain and spinal cord imaging may also be conducted to exclude any underlying structural abnormalities.[3,6] However, there are currently no standardized testing protocols for BDD. Thus, despite the variety of proposed diagnostic approaches available, its diagnosis remains highly

complex and challenging. It is essential to obtain comprehensive history and perform thorough examination in order to accurately diagnose this condition, as diagnostic tools are only supplementary and may not always provide evidence that could account for such movements.[2,7,8] In this patient, there were no neurological deficits that would suggest an underlying structural abnormality. Additionally, the presence of her long-standing psychiatric condition points to a stress-induced etiology. Therefore, we did not conduct extensive diagnostics on this patient.

These involuntary movements of the abdomen may present variably, but commonly consist of repetitive, writhing movements of gradual onset which often subside during sleep. Shortness of breath and abdominal and/or chest pain may also be experienced by patients with BDD.[1] In approximately 50% of cases, a previous history of local trauma or surgical procedures of the abdomen is present.[8] Although the majority of cases are idiopathic, a range of etiologic factors have been suggested, including abdominal surgery, diaphragmatic flutter, intramedullary thoracic cord tumor, levodopa-induced movements, and basal ganglia lesions.[9] Through thorough history, the aforementioned etiologies were excluded based on clinical grounds. Contractions of the abdomen may frequently be mistaken for convulsions. In our patient, ictal etiology has been ruled out with an EEG.

Certain medications have been reported to induce BDD, including levodopa,[10] clebopride,[8] and galantamine.[11] A notable association between BDD and the dopaminergic system is highlighted in these cases. Studies have proposed that serotonin may exert an indirect inhibitory effect on the dopaminergic system, leading to a reduction in dopaminergic activity.[12,13] Our patient's medication history was significant for long-term use of vortioxetine, a selective serotonin reuptake inhibitor (SSRI). Although SSRIs have been associated with the development of movement disorders, there are currently no reported cases of SSRI-induced BDD.[14] In addition, our patient has been on medication with SSRI for many years prior to the onset of her dyskinesia, with no history of consuming the aforementioned drugs that may induce BDD, further confirming that her BDD is not drug-induced.

Psychogenic factors are known to provoke BDD, including anxiety and hysteria.[15] Stress is known to directly affect the motor system function due to the presence of glucocorticoid receptors in certain motor regions, thus making these areas vulnerable to the effects of cortisol, a hormone produced by stress. Our patient's past medical history was significant for long-standing anxiety disorder and depression. She reported that her abdominal contractions were especially prominent in the presence of stress. Therefore, her underlying psychogenic condition may have been the precipitating factor for her BDD.

Exacerbation of dyskinesia during our patient's menstrual period remains a matter of intrigue. Albeit there is currently no data addressing the impact of hormonal changes during menstruation on motoric

symptoms of BDD, several studies have reported worsening of motor symptoms during the menstrual period in other movement disorders, namely Parkinson's disease (PD) and dystonia.[16,17] Evidence suggests that estrogen plays a role in the dopaminergic system, although the precise mechanisms by which it acts on basal ganglia circuits and contributes to the worsening of movement disorders remain largely unclear and unexplored. The absence of hormonal-related BDD cases warrants further research on the matter.

The primary approach in the management of BDD is symptomatic treatment, as the efficacy of previously reported therapeutic options remains a matter of debate. These drugs include benzodiazepines, beta-blockers, vitamin B12 supplements, antipsychotics, anti-seizure medications, and antidepressants.[6] Clonazepam is a benzodiazepine that has been found to decrease the frequency and intensity of abdominal contractions in BDD. Comparable to our case, Gupta *et al.* reported successful alleviation of dyskinesia with clonazepam. In contrast, Kono *et al.* reported relapse and progressive worsening of BDD after cessation of clonazepam.[18] Tamaya *et al.* reported the successful treatment of BDD with haloperidol.[19] However, antipsychotics are often associated with a significant number of adverse effects, and on occasion may exacerbate dyskinetic symptoms in patients with BDD induced by medications affecting the dopaminergic pathway.[20] In drug-induced cases, the offending medication should be discontinued.[6] In this patient, we used clonazepam to manage her BDD. In addition, her underlying psychiatric condition was addressed through education regarding its possible impact on her BDD.

Several invasive techniques have been suggested in the treatment of BDD. A case series by Alshubaili *et al.* reported full recovery of BDD with botulinum toxin injections, although further evidence is still required to assess their effectiveness.[21,22] The successful use of transcutaneous electrical nerve stimulation (TENS) in BDD has also been reported.[8] In individuals with refractory BDD despite treatment with oral medications and botulinum toxin injections, deep brain stimulation (DBS) may be considered. Schrader *et al.* and Valálik *et al.* reported significant improvement of dyskinesia with DBS targeting the internal globus pallidus.[23,24] However, evidence-based recommendations for the management of BDD are still unavailable to date, making its treatment largely based on case reports and expert opinions. In our case, the patient's contractions resolved with oral medication, therefore invasive therapeutic strategies were not required.

Conclusion

BDD continues to present significant diagnostic and therapeutic challenges, primarily due to the lack of standardized diagnostic and treatment guidelines. Given that BDD is a clinical diagnosis, it is imperative for clinicians to maintain a high index of suspicion and to be well-versed in its manifestations and diverse etiologies to ensure accurate diagnosis and appropriate management. This case demonstrates a previously

unreported association between BDD and the menstrual period.

Conflict of Interest

The authors declared no conflict of interest.

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