

Belly Dancer's Dyskinesia in Children: A Case Series

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ABSTRACT

Background: Belly dancer's dyskinesia (BDD) is a rare movement disorder that affects the diaphragm and abdominal wall. It is characterized by spontaneous involuntary, rhythmic contractions of the diaphragm which makes the abdominal wall move in a way that resembles the belly dancer's movements. Majority of the documented reports were that of adults.

Case reports: We presented three cases of Bellydancer's dyskinesia seen in children within a period of one year. Two of the cases started spontaneously while one was triggered by persistent sneezing. They all resolved while sleeping or lying supine. Diagnosis was made clinically. Electroencephalography done for the patients were normal. Electromyogram was not done due to unavailability while abdominal ultrasound and Brain MRI were not done for the patients due to out of pocket payments and financial constraints. The first case responded well to Clonazepam after one month of treatment while the other two cases did not respond to Clonazepam. They responded moderately to sodium valproate and then completely to oral Gabapentin.

Conclusion: There is need for the creation of awareness on BDD to help clinicians avoid unnecessary and prolonged investigations and treatments.

KEYWORDS: Belly dancers, Dyskinesia, Electromyogram, Electroencephalogram, Gabapentin

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INTRODUCTION

Belly dancer's dyskinesia (BDD) is a rare movement disorder that affects the diaphragm and the abdominal wall.¹ It was first described by Iliceto *et al* who named it "belly dancer's dyskinesia." It was introduced to describe repetitive semirhythmic multidirectional displacements of the umbilicus associated with writhing contortions of the anterior abdominal wall.¹⁻³ It is characterized by spontaneous involuntary, rhythmic contractions of the diaphragm which makes the abdominal wall move in a slow writhing way that resembles the belly dancer's movements, having variable amplitude and frequency.^{1,2,4} The cause of BDD is largely unknown, but it is believed to be due to irritation of the phrenic nerve or the diaphragm itself.⁵ It could also be a sign of other neurological disorders. A similar disorder is referred to as Belly dancer's syndrome when there is a co-existence of diaphragmatic myoclonus (often caused by a neurological lesion) and Belly dancer's dyskinesia.^{2,6,7} Diaphragmatic

myoclonus has been associated with some disorders of both the central and peripheral nervous system, such as encephalitis, stroke, osmotic demyelination of the CNS, trauma, or irritation of the nervus phrenicus. The myoclonus does not subside during sleep.⁶ The diagnosis of BDD is mainly clinical and based on the characteristic symptoms.⁸ Investigations that could be done include abdominal ultrasound, thoracic video fluoroscopy, or electromyography (EMG) to confirm the movements. An electroencephalography (EEG) can be done to rule out similar manifestations of cortical origin.¹ This article aims at creating awareness on Belly dancer's dyskinesia in order to avoid unnecessary and prolonged wrong treatment since it causes a lot of anxiety and affects the activities of daily living.

CASE SERIES

CASE 1

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We hereby describe the case of an eight-year-old boy who spontaneously developed a persistent hiccup with resultant rhythmic contraction of his abdominal wall resembling a belly dance of three days prior to presentation. It was relieved by lying supine or sleeping. It was initially misdiagnosed as an asthmatic attack with no response to salbutamol nebulization and prednisolone. Chest X-ray done was essentially normal. Physical examination revealed an anxious boy with persistent diaphragmatic spasms and slow writhing abdominal movement with no significant chest findings. Other systemic examinations were essentially normal. A routine video electroencephalography (vEEG) done was normal with no epileptiform discharges seen. The child responded well to Tab Clonazepam which he took for a period of one month. Brain imaging was not done after a normal vEEG report due to financial constraints and instant response to oral Clonazepam.

CASE 2

The second case was that of a six-year-old boy who developed persistent hiccup-like attacks with persistent involuntary rhythmic painless but discomforting contractions of his abdominal wall resembling a belly dance, of two days prior to presentation. It was triggered by several episodes of forceful paroxysmal sneezing following an upper respiratory tract infection. It was relieved while patient slept and recurred on waking up. It was initially thought to be a seizure, for which he was placed on oral Carbamazepine which he did not respond to. Physical examination revealed an anxious boy with persistent diaphragmatic spasms and resultant

abdominal wall rhythmic movements. Chest examination showed good bilateral air entry, with no added sounds. Heart sounds were normal with no murmur. Other systemic examinations were essentially normal. Full blood count and serum electrolytes including magnesium and phosphate were essentially normal except for mild hypocalcaemia which was corrected. The child did not respond to oral Clonazepam, thereafter Tab Sodium valproate was commenced with some improvement until oral Gabapentin was added then the symptoms completely subsided.

CASE 3

The third case was that of a ten-year-old female who spontaneously developed persistent hiccup and an involuntary abnormal belly dancing-like abdominal wall movement of four months duration prior to presentation. It subsided while sleeping. The spasms were discomforting but not painful sometimes making breathing difficult. Over the months, she developed pain on the ribs bilaterally. She was initially treated with diazepam and Plasil injection with no response. Physical examination revealed an anxious girl with persistent diaphragmatic contraction and abnormal abdominal wall rhythmic movement. Other systemic examinations were essentially normal and laboratory tests such as full blood count and electrolytes were essentially normal. Video EEG done showed a normal study with no epileptiform discharges seen. Brain MRI could not be done due severe financial constraint. However, she did not respond to tab Clonazepam but later responded to Gabapentin.

Table 1: Clinical characteristics of the cases

Age of the patients	Gender	Duration prior to presentation	Trigger factor	Resolution on supine position and sleep	Video EEG	Effective Drug treatment
Case 1 : 8 years old	Male	3 days	Unknown	Yes	Normal study	Clonazepam
Case 2: 6 years old	Male	2 days	Persistent sneezing	Yes	Not done	Moderate: Sodium Valproate Complete: Gabapentin
Case 3: 10 years old	Female	3 months	Unknown	Yes	Normal study	Moderate: Sodium Valproate Complete: Gabapentin

DISCUSSION

Belly dancer’s dyskinesia is known to be a rare disorder.¹⁻⁵ However, in this report, we had three documented cases at the St Cathrines Specialist Hospital Port Harcourt, Nigeria in an interval of one year (between May, 2025 and May, 2026). The cause of BDD is largely unknown, but in this series the first and third case reported started spontaneously while the

second case started after he had episodes of paroxysmal sneezing probably causing an irritation of the phrenic nerve. The most reported causes associated with BDD were idiopathic, drug-induced, postsurgical procedures, pregnancies, and Vitamin B12 deficiencies.¹ However, vitamin B12 was not assayed in the index cases due to financial constraints. A case of BDD has also been reported

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following an acute corpus callosum infarction.⁷ Two out of three patients in a case series manifested vitamin B12 deficiency while one of them showed values close to the lower limit of normal. However, the relevance of vitamin B12 levels remains elusive in the aetiology of BDD.⁵ All the three patients improved following a combined therapeutic approach of clonazepam treatment and vitamin B12 supplementation. BDD is generally a diagnosis of exclusion, hence other common disorders with similar presentation such as psychogenic seizures or diaphragmatic myoclonus should be ruled out.¹

The epidemiology and clinical characteristics of BDD is variable.⁸ Majority of the cases documented were case reports seen in adults. The three cases in this index case series were of the school age group, ranging between six and ten years. This could be explained by the fact that the cases were seen in a Paediatric Neurology clinic, hence no adult was captured. One of the cases in this report is a female while the other two are males. The case series by Rathman *et al.*, were that of three male adults,⁵ while a narrative literature review revealed that BDD is commoner in female adults.¹ Other articles on BDD were majorly individual cases of both male and female adults.⁴⁻⁸

The narrative literature review also reported an average age of 49.8 years of the cases with eight of them being children out of 59 adults.¹ This discrepancy in the age groups compared to our index cases could be as a result of the fact that we see only children in our Paediatric Neurology clinic, hence no adult was captured. Another probable explanation could be that the change in lifestyles and the environment (climate)⁹ over the years could make BDD commoner in children nowadays. None of our cases had unilateral abdominal wall dyskinesia as documented by Rissardo *et al.* that a few patients have unilateral BDD.¹

Diagnostic tools are requested to rule out other causes that could mimic BDD symptoms.¹ The electroencephalography (EEG) done for our patients showed normal studies, however needle EMG was not done for any of our patients due to unavailability of the equipment. Hers *et al* reported that the clinical features and electromyographic (EMG) patterns of focal dyskinesias resemble dystonic movements; that is, rhythmic, repetitive, alternating movements superimposed on sustained postures.³ Rissardo *et al* reported that the pattern of muscle contraction BDD includes EMG bursts of 400–1,000ms duration and superimposed jerky movements.¹ On the other hand, Chen *et al.*,¹⁰ reported that diaphragmatic myoclonus showed rhythmic contractions of the diaphragm and external intercostal muscles at 4 to 5 Hz with the generator source likely related to respiratory centres in the rostral medulla.¹⁰

Our index cases were not subjected to ultrasonography of the muscles involved. Ultrasonography allows to noninvasively visualize the diaphragm function and activity at the bedside.¹¹ It was used to clearly delineate the diaphragm as the source of abdominal movements in a reported case of diaphragmatic

myoclonus with the ability to demonstrate entrainability of the diaphragm to hand tapping to a prescribed rhythm set by the examiner.¹²

Concerning the treatment of BDD, its aetiology is largely unknown and treatment is usually symptomatic.¹³ The first case in this index report responded well to oral Clonazepam which he received for one month. Similarly, a reported case of a 14-year-old girl responded to oral diazepam.¹⁴ On the other hand, the other two cases in our series did not respond to Clonazepam. They rather responded well to oral Gabapentin after a moderate response to oral sodium valproate trial. The literature suggests that the improvement with benzodiazepines may suggest myoclonic rather than dyskinetic movements.¹ Supplementation is necessary when a metabolic deficiency is found. There are cases of Vitamin B12 deficiency that the supplementation showed to significantly improve the patient's motor symptoms.⁵ The standard approach for drug-induced BDD is to discontinue the offending drug.¹ Antiseizure medications and benzodiazepines can be used if the patient did not improve after the discontinuation of the offending drug.¹ Cases resistant to the above approaches should be managed with antipsychotics.¹³ However, it is important to consider that the dyskinetic symptoms could worsen, especially in individuals whose BDD was associated with medications related to the dopaminergic pathway.¹

The differential diagnoses of BDD include diaphragmatic myoclonus, cardiac conditions, truncal dystonia, abdominal motor seizures, propriospinal myoclonus, and functional or psychiatric disorders.¹ Other documented differential diagnosis range from cerebral, spinal, peripheral, hormonal/drug-induced effects to local or even unknown/idiopathic and functional/psychogenic causes.⁵ Laboratory tests in BDD should be performed to rule out other differentials with special attention to thyroid profile, Vitamin B12 levels, and glycemic levels with urine ketones.^{1,5} Brain and spinal neuroimaging should be obtained to exclude possible demyelinating diseases, structural damages, or signs of possible spinal cord lesions. Electrodiagnostic studies (EEG and EMG) should be performed to evaluate the characteristics of the abnormal movement.¹

CONCLUSION

Belly dancer's dyskinesia is supposed to be a rare diaphragmatic disorder. However, these three cases were seen in children a space of one year. Hence there is need for its awareness to be created, to help clinicians avoid prolonged unnecessary treatments and reduce the resultant anxiety caused by the disorder.

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Figures 1-7 below show the Pictures and electrocardiographs of the patients normal studies.

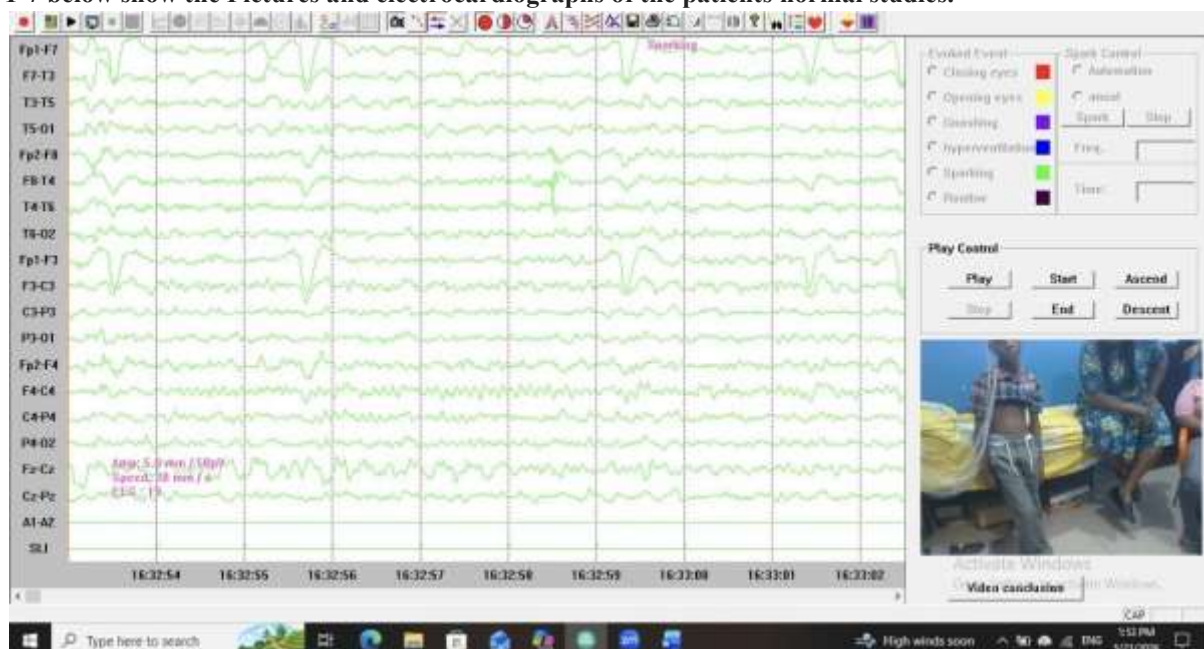


Fig 1: Electroencephalograph of case 1



Fig 2: Electroencephalograph of case 1

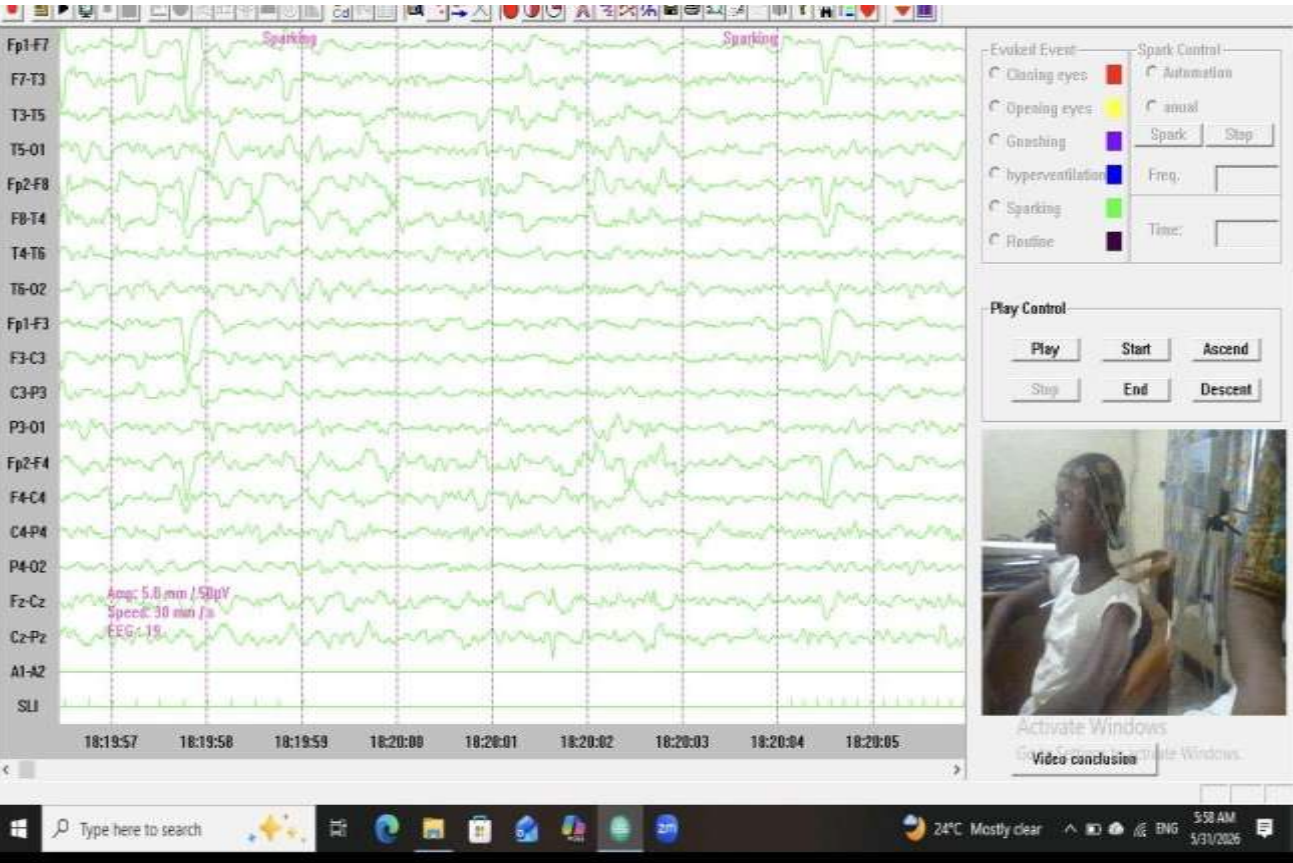


Fig 3: Electroencephalograph of case 3

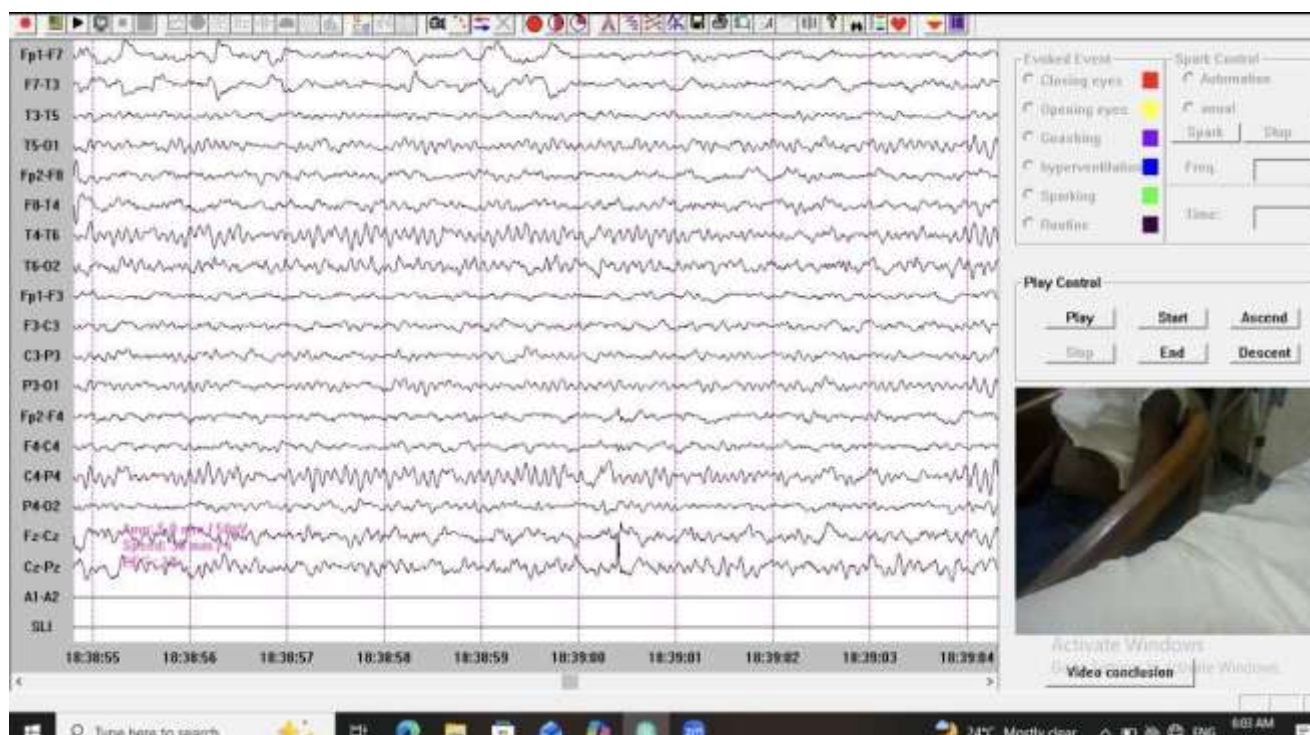


Fig 4: Electroencephalograph of case 4



Fig 5: Picture of case 1 having BDD

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Fig 6: Picture of case 2 having BDD



Fig 7: Picture of case 3 having BDD

DECLARATIONS

Prior to this publication, written informed consent and assent were gotten from the caregivers and patients respectively. Ethical clearance was gotten from St Cathrine's Specialist

Hospital Port Harcourt, Nigeria where the patients were managed.

There is no conflict of interest