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Dopa-responsive dystonia or Segawa disease in Ghana: a case report

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Abstract

Dystonias are rare in childhood and consist of variably sustained twisting deformation of a limb or parts of a trunk. Dystonias can be considered primary because of a genetic disorder or secondary due to a central nervous system injury like cerebral palsy or medications. The rare dopa-responsive dystonia is often mistaken for cerebral palsy, stroke, localized limb trauma or conversion disorder. The aim of this report is to increase the awareness of a rare but eminently treatable type of dystonia known as dopa–responsive dystonia or Segawa disease. In this report a young girl with dystonia who was severely disabled and could not attend school was misdiagnosed as cerebral palsy for two years. After treatment with low dose L-dopa within 48 hours, a dramatic and sustained response with restoration of foot dystonia and mobility was observed. Recognition of L-dopa dystonia facilitates proper treatment and significant improvement in quality of life.

Keywords: Dopa-responsive dystonia, Segawa disease, Ghana

INTRODUCTION

Dopa–responsive dystonia (DRD) or Segawa disease is a rare condition that has not been reported in Ghana to the best of the author's knowledge. The condition is rare (0.5 - 1 per million) but important to recognize because it is treatable [1]. Onset is usually before the age of 5-8 years but can occur as early as the first year of life and even in neonates in some cases [2]. The phenotype in childhood DRD may resemble dyskinetic cerebral palsy which is not uncommon in neurological clinics in the local setting since biluribin encephalopathy as a cause of cerebral palsy is relatively common in Ghana [3]. In this report a young girl with classic DRD who was severely disabled and could not attend school was misdiagnosed as cerebral palsy for two years.

Case history

A 7-yr. old female presented to Tema General Hospital with a diagnosis of cerebral palsy following a referral from a border town in a neighbouring country. Her complaint was that starting two years ago she had developed a gait disturbance, increasing difficulty walking to school with frequent falls and the condition was progressive. She complained that her feet turned inwards whilst walking and could no longer attend school because it was painful to walk anywhere. There was no significant information elicited from the birth and medical history. Her early developmental milestones were achieved in normal fashion. She walked normally at the age of 13 mos. The parents were not related. There was no family history of note. She had received treatment with baclofen and physiotherapy prior to referral.

At the Tema General Hospital she was assessed and her cognitive skills were intact. Neurological examination found an increased tone in the lower limbs and her deep reflexes were brisk. The increased tone was velocity dependent and not constant to regard it as rigidity. There was clonus and a mild pes cavus deformity noted. There was no rest tremor. Cerebral palsy (spastic diplegia) or a muscular dystrophy was suggested. On consultation with the Neurology and Developmental clinic at the Korle Bu Teaching hospital, specific enquiries as to whether there was a diurnal fluctuation of symptoms was made and whether her situation improved after sleep because the history had suggested a later onset in life of the walking difficulties thus ruling out cerebral palsy. The answer was positive and that symptoms were minimal after sleep and became more severe in the late afternoon and evening. There was also no evidence of lead pipe rigidity. This led to a clinical suspicion of DRD and a trial of L-dopa 25 mg

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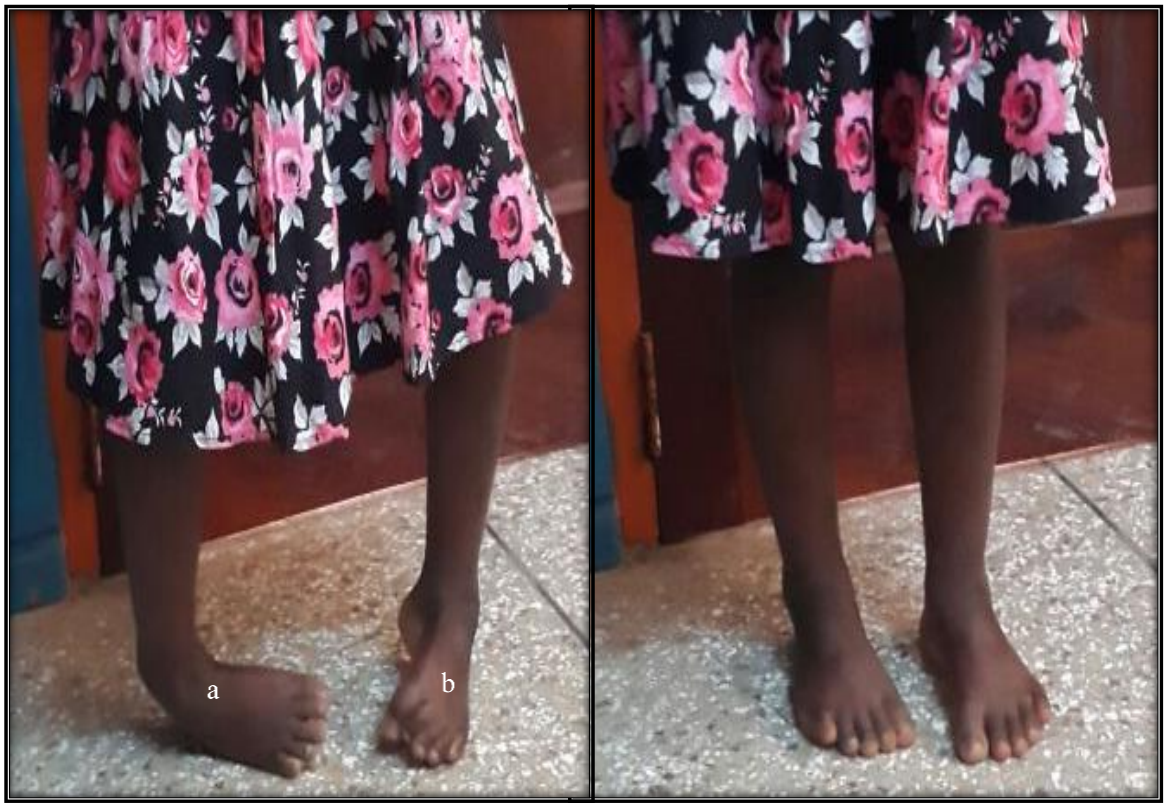

Plate 1: 7-yr. old female patient at presentation with equinovarus foot deformity [dystonic posture at 'a' and 'b']

Before

Plate 2: 7-yr. old female patient with corrected foot deformity after 48 h on 25mg daily L-dopa

After

once daily was instituted. Within 48 h of starting therapy the parents and child confirmed that all the walking difficulties and the abnormal posture had disappeared miraculously Plate 1 and Plate 2. She was beaming with smiles. Clinical pictures and video recordings were made after seeking consent before and after drug therapy. A clinical diagnosis had been clinched. The parents were seen on two more occasions one month apart for review with a good and sustained response to L-dopa and went back to their village. They were counselled that the child will require the medication for life.

DISCUSSION

The patient showed classic features of DRD in that there was a diurnal variation in her symptoms which had not been elucidated from the history. Indeed, the hallmark of the disease is marked diurnal variation, improvement with sleep and a dramatic response to low dose L-dopa without motor fluctuations [4]. Cerebral palsy is a common and a well-established diagnosis in the local setting for any child with gait abnormalities and brisk reflexes and it was no surprise that the provisional diagnosis remained so for years. In previous series up to 24% of patients with DRD had been misdiagnosed as cerebral palsy [5]. Inheritance is usually autosomal dominant though recessive inheritance may be seen in a few cases. The enzyme responsible for DRD is GTP cyclohydrolase1 (GCH 1) on chromosome 14q, a rate limiting enzyme in the synthesis of dopamine. Tyrosine hydroxylase makes dopamine from Tyrosine using tetrahydrobiopterin (BH4) as a co-factor. The GCH 1 takes the initial step in the synthesis of BH4. The defect in GCH 1 activity causes decreased dopamine synthesis and is responsible for the symptoms of DRD [6].

The diagnosis of DRD or Segawa disease used to depend on demonstration of a dramatic response to low dose L-dopa which is what this case presents but in recent times analysis of CSF neurotransmitters demonstrates low concentrations of biopterin and neopterin while sequencing demonstrates the pathogenic mutation of the GTP cyclohydrolase-1 gene in up to 80% of cases [7]. Parkinsonian features are seldom marked in children in whom the presentation is usually dystonic like the presentation in this child. Untreated patients often develop Parkinsonism in adolescence or adulthood [8].

Conclusions

The diagnosis of DRD or Segawa disease must be considered in all cases of dystonia including cases of apparent dystonic cerebral palsy and especially where there is no history of birth asphyxia. The diagnosis must be thought of in cases of spastic diplegia with no history of preterm birth. A therapeutic trial of L-dopa is indicated when there are doubts and a dramatic response clinches the diagnosis.

DECLARATIONS

Ethical considerations

Informed consent was obtained from parents of patient for this case report. This report does not contain any information that could lead to traceability of the patient.

Consent to publish

Not applicable

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None

Competing Interests

No potential conflict of interest was reported by the author.

Author contributions

BVE conceived the topic, drafted, and edited the manuscript.

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Availability of data

All relevant information is provided in the manuscript. The published information is available from the author upon a reasonable request.

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