

## 1 CASE REPORT

2 Dopa-Responsive Dystonia subsequent to  
3 Lamotrigine Administration: Case Reports

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7 This paper is available online at <http://ijpt.tums.ac.ir>8 **ABSTRACT**

9 Epilepsy is a common neurologic disorder affecting approximately 1% of the population. The prevalence  
10 of active epilepsy in Kerman, Iran is 7.87/1000 individuals. The past decade has brought many advances  
11 to the treatment of epilepsy, including many new pharmacological agents. Lamotrigine is one of the new  
12 antiepileptic drugs. Lamotrigine has many side effects; the most important of which are allergic reactions.  
13 In this article, the author reports two cases of dopa-responsive dystonia (DRD) after few months  
14 administration of lamotrigine for epilepsy. The cases are two girls (4 and 5 years old) who had seizures  
15 and received lamotrigine 50 mg/day. They have been free of seizure after treatment but after some time  
16 the dystonic attacks developed. Lamotrigine administration discontinued, but dystonic attacks didn't  
17 disappear. Levodopa /carbidopa was started. After a few days, the dystonic pastures disappeared. In  
18 conclusion, lamotrigine may introduce dystonia in susceptible patients. These dystonic attacks might  
19 beresponsive to levodopa.

20 **Keywords:** ?????

21 Epilepsy is a common neurologic disorder affecting 42 other medications such as valproic acid. It's  
22 about 1% of the population [1]. The prevalence of 43 predominantly metabolized in the liver by  
23 active epilepsy in Kerman, Iran is 7.87/1000 individuals 44 glucuronidation [9]. Lamotrigine has many side effects,  
24 [2]. Pharmacotherapy with antiepileptic drugs remains 45 most importantly allergic reactions. Gradual introducing  
25 the major treatment modality for epilepsy. This could 46 lamotrigine is one of the keys to reduce the frequency  
26 occur as a result of decreased excitation concurrent with 47 and severity of allergic reactions [5]. Although the  
27 increased inhibition [3]. Management of epilepsy differs 48 overall incidence of cutaneous reactions to lamotrigine  
28 from the treatment of other chronic diseases in that a 49 is high, the incidence of serious eruptions such as  
29 single breakthrough event has a major negative effect 50 erythema multiform, Stevens-Johnson syndrome, and  
30 on quality of life. Complete control of seizures is 51 toxic epidermal necrolysis is low [10,11]. The revision  
31 necessary as a single seizure impacts negatively on 52 of La Roche and Helmers demonstrated that side-effects  
32 patient quality of life and independence [4]. 53 led to drug withdrawal in 10.2% of all patients under

33 The past decade has brought many advances to the 54 lamotrigine therapy. Rash was the main reason for  
34 treatment of epilepsy, including many new 55 treatment discontinuation. It has been postulated that  
35 pharmacological agents. Lamotrigine is one of the new 56 side-effects may be lessened by slow introduction and  
36 antiepileptic drugs; it's been used more than two 57 titration [12,13].

37 decades [5-7]. Lamotrigine is a broad-spectrum 58 The present study reports two cases of dopa-  
38 antiepileptic drug of the phenyltriazine class chemically 59 responsive dystonia (DRD) after lamotrigine  
39 unrelated to other anticonvulsants [8]. Lamotrigine has 60 administration for a few months due to epilepsy. DRD  
40 an average elimination half-life of 33 hours, although 61 is a broad term used to described forms of dystonia  
41 this can be influenced by concomitant therapy with 62 characterized by the onset dystonia in early childhood

63 with dramatic and sustained response to treatment with  
64 levodopa. This disorder was first described by Segawa  
65 [14]. The most common form of DRD is an autosomal-  
66 dominant condition (DYST5) caused by mutation of the  
67 gene for guanosine triphosphate cyclohydrolase [15].

## 68 CASE REPORTS

### 69 Case 1

70 A 5 years old girl who used lamotrigine 50 mg per  
71 day due to tonic-clonic seizure and had her first attack  
72 of seizure two months before her first visit. After  
73 starting lamotrigine, the patient was free from seizure  
74 for one year. Dystonic posture was developed in lower  
75 limb and after a time spread to lumbar spine, and then to  
76 the cervical area. Dystonic attacks worsened later in the  
77 day. Results of physical examinations, brain's MRI  
78 scans and hematologic and serologic laboratory tests  
79 were normal. Dystonic posture did not disappear after  
80 lamotrigine was discontinued. The dystonic attacks  
81 disappear after two days, when 50 mg per day  
82 levodopa/carbidopa was started.

### 83 Case 2

84 A 4 years old girl used lamotrigine 50 mg per day  
85 due to complex partial seizure. She had had her first  
86 attack of seizure a few months before her first visit.  
87 After receiving lamotrigine for two months, dystonic  
88 posture developed in lower limb and then spread to  
89 lumbar spine. Dystonic posture worsened later in the  
90 day. Physical examinations, brain's MRI scans,  
91 hematologic and serologic laboratory tests were normal.  
92 Dystonic posture did not disappear after lamotrigine  
93 discontinued. The dystonic attacks disappear after three  
94 days, when 50 mg per day levodopa/carbidopa was  
95 started.

## 96 DISCUSSION

97 DRDs are a group of disorders that show a good  
98 response to levodopa. The causes of these disorders are  
99 unknown, but the mutation of a gene is recognized in  
100 some studies. Onset of this disease usually happens in  
101 the first decade of life starting with foot dystonia, which  
102 progress to involve other body parts, but typically  
103 remains more severe in the lower extremities. The  
104 severity increases progressively over the first two  
105 decades of life, but plateaus with relatively few side  
106 effects and no long-term complication [16]. Untreated  
107 individuals developed diurnal fluctuations with marked  
108 improvement in the morning and worsening in the  
109 evening. DRDs are more frequent in female than in  
110 males, with a ratio varying from 1 to 4.3:1. Diagnosis of  
111 DRD can often be made on clinical grounds [17].  
112 There are reports about DRD induction by diazepam  
113 [18], bupropion [19], cetirizine [20], riluzole [21], and  
114 tetrabenazine [22]. The authors, however, didn't find  
115 any reports about post-lamotrigine conditions.  
116 Lamotrigine is a new antiepileptic agent that is

117 frequently used in epileptic patients with a good  
118 tolerability and efficacy. Lamotrigine has side effects,  
119 the most important of which is exfoliative dermatitis  
120 and rashes [23]. A study showed dizziness in 11%, and  
121 ataxia in 12% of cases, but if treatment begins with low  
122 doses, these events decreases [24]. Other side effects  
123 were also reported such as sudden death due to cardiac  
124 dysrhythmia in two cases [25], psychosis as one of the  
125 rare side effects of lamotrigine [13], oral ulcers [26],  
126 chorea [27], leucopenia and thrombocytopenia [28],  
127 anticonvulsant hypersensitivity syndrome [29],  
128 abnormal eye movements and hyper-sexuality [30]. This  
129 dystonic effect may be due to the lack of selectivity of  
130 lamotrigine to block glutamate release in susceptible  
131 individuals. In dystonic mutant hamsters when  
132 subsided, dystonia can be re-invoked when these  
133 animals receive sodium channel blockers such as  
134 lamotrigine [31- 34]. The patients under discussion are  
135 two girls (4 and 5 years old) who had seizure and  
136 received lamotrigine for a time and were free of seizure  
137 attacks. Dystonic attacks disappeared after receiving 50  
138 mg/per levodopa/ carbidopa. In conclusion, lamotrigine  
139 may introduce dystonia in susceptible patients. The  
140 dystonic attacks are responsive to levodopa.

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