Case Report

LGII-negative faciobrachial dystonic-like seizures originating from the insula

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1. Introduction

Faciobrachial dystonic seizures (FBDS) have been described as the pathognomonic semiology for autoimmune limbic encephalitis associated with nonparaneoplastic antibodies to voltage-gated potassium channels (VGKC) especially to the specific neuronal target leucine-rich glioma inactivated-1 (LGIl) [1,2]. Here, we report a case of LGIl-seronegative faciobrachial dystonic-like seizures as a form of probable insular epilepsy.

2. Case presentation

A 67-year-old woman presented with stereotyped episodes of burning dysesthesias over the entire left hemibody, with dystonic posturing of her left face and arm lasting for 30–60 s and hypersalivation, followed by transient left hemiparesis. Awareness was intact. There were no triggers. The episodes started 20 years prior, occurring infrequently, but progressed to occur every 10–15 min. Formal neuropsychological testing for reported memory problems showed impaired working and declarative visuospatial memory. She had a past medical history of hypertension and a left cerebellopontine angle meningioma that had been stable over decades. On continuous video-EEG, the episodes correlated with right posterior temporal seizures (Fig. 1). The interictal EEG demonstrated continuous right temporal rhythmic delta activity and right lateralized periodic discharges in sleep. MRI of the brain showed T2 prolongation along the posterior right insula with dilatation of the sylvian fissure consistent with volume loss, and a stable left cerebellopontine meningioma (Fig. 2). CSF protein, glucose, and leukocyte count were normal, and IgG was mildly elevated, 6.4 mg/dL (range: 0.5–6.1 mg/dL). Serum antibodies against LGIl, VGKC, CASPR-2, and GAD-65 were negative. CSF antibodies against VGKC-complex, NMDA-R, GABA-B-R, AMPA-R, Anti-Neuronal Nuclear Type 1–3, Purkinje Cell Cytoplasmic Type 1/2/Tr, Amphiphysin, CRMP-5-IgG, Hu, and Yo were negative. Seizures persisted despite administration of oxcarbazepine, levetiracetam, intravenous steroids, and intravenous immunoglobulin infusion and she improved with phenobarbital and lacosamide.

3. Discussion

We summarize key differences between FBDS associated with LGIl encephalitis and faciobrachial dystonic-like seizures associated with insular epilepsy in Table 1. Faciobrachial dystonic seizures are described in LGIl encephalitis, associated with the LGIl antibody in 80–90% cases [1,2]. In LGIl encephalitis, FBDS are usually less than 3 s in duration, peak in frequency by 1–8 months, affect the face and ipsilateral arm uni- or bilaterally with or without secondary generalization, and are associated with impairment of consciousness [1,2]. In LGIl-positive FBDS, scalp EEG shows ictal epileptiform discharges in 13–40% cases [1–3]. MRI in LGIl-positive FBDS may show hyperintense FLAIR signal or atrophy in the mediolateral temporal lobes [1]. Memory impairment occurs in 77%–81% cases [1–3] after a median lag of 36 days following onset of FBDS [2]. Hyponatremia occurs in 80–100% cases [1,2].
In contrast, our patient had prolonged (30–60 s) unilateral seizures with preserved consciousness for over 20 years. She demonstrated contralateral painful dysesthesias, hypersalivation, and preservation of consciousness with faciobrachial dystonic-like seizures. In patients with insular–opercular seizures, asymmetric tonic posturing has been described with contralateral painful dysesthesias, preservation of consciousness, and viscerosensitive symptoms such as laryngeal constriction and hypersalivation [4,5]. A clear ictal EEG correlate was present in our patient. Her MRI demonstrated a posterior insular lesion, which has been hypothesized with faciobrachial dystonic-like seizures as the anatomic origin of painful dysesthesias [4]. In contradistinction to LGI1-positive FBDS, our patient’s onset of visuospatial processing dysfunction was relatively recent. Hyponatremia was absent.

The anatomic origin of dystonia may also differ between LGI1-positive FBDS and faciobrachial dystonic-like seizures associated with insular epilepsy. LGI1-positive FBDS have been associated with contralateral basal ganglia abnormalities on MRI and FDG-PET, suggesting localization to that area [3]. The paucity of epileptic discharges on EEG with FBDS and abnormal metabolism in basal ganglia suggests an abnormal paroxysmal extrapyramidal manifestation from the spread of epileptic discharges to the basal ganglia [3,6,7]. The dystonic posturing in insular seizures has been studied only in sleep and has been described with complex hyperkinetic automatisms such as pedaling, and found to be associated, with ictal spread to the frontomesial regions (particularly the supplementary motor area) [5]. Such complex behavior was absent in our patient.

To summarize, the presence of unilateral and prolonged dystonic posturing without impaired awareness, an ictal EEG and an alternate pathology on MRI, a lack of a robust association between onset of seizures and memory impairment, and absence of hyponatremia, are suggestive of LGI1-negative faciobrachial dystonic-like seizures as form of non-autoimmune lesional epilepsy. In our case, distinct painful dysesthesias involving a large cutaneous distribution, hypersalivation, scalp ictal EEG findings, and MRI showing insular pathology supported an etiology of insular seizures. Dystonia may be due to spread to the basal ganglia, but further data are needed for confirmation. LGI1-positive FBDS are typically poorly responsive to antiseizure drugs, but respond to immunotherapy, which may also help prevent cognitive dysfunction [1,2,8]. In LGI1-positive FBDS, the use of two anticonvulsants for a median of 29.5 days showed poor response. Following that, initiation of corticosteroids with or without IVlg or plasma exchange showed more than 20% reduction in FBDS in 90% of the patients [8]. Our patient responded after the addition of third and fourth additional.
antiseizure drugs. Insular epilepsy should be included in the differential diagnosis in patients presenting with faciobrachial dystonic-like seizures, and therapy should be guided accordingly.

Disclosure

None of the authors has any conflict of interest to disclose.

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Table 1

Features differentiating faciobrachial dystonic seizures associated with LGI1 limbic encephalitis from faciobrachial dystonic-like seizures associated with insular epilepsy.

| Feature                                      | FBDS associated with LGI1 limbic encephalitis | Faciobrachial dystonic-like seizures associated with insular epilepsy |
|----------------------------------------------|----------------------------------------------|---------------------------------------------------------------------|
| Time to diagnosis from onset of symptoms to diagnosis | 1–8 months [1,2]                              | Variable (months–years)                                              |
| Duration of dystonia                         | Usually brief (1–3 s) [1,2], rarely >10 s     | Prolonged (30–60 s)                                                 |
| Laterality of dystonia                       | Unilateral (40%), bilateral independent (50–69%) [1,2,8] – including rapidly alternating, or bilateral simultaneously rarely [8] | Unilateral (contralateral to MRI lesion) [5]                        |
| Impairment of awareness                      | Common [1–3]                                  | Absent [4]                                                          |
| Triggers                                     | Heightened emotion, kinesigenic, loud noise [8] | None in our case                                                    |
| Association with generalized seizures        | Present [1,2]                                 | Absent [4,5]                                                        |
| Memory impairment                            | Common and within short lag between preceding FBDS (median 36 days) [2] | Uncommon with variable duration, long lag from preceding dystonic episodes in our case |
| Sensory aura                                 | Present in 80% described as tingling sensation in midline of body (including face, chest or diffusely) [8] | Contralateral dysesthesia in seizures of insular origin [4,5]       |
| Hypermotion                                  | Absent                                        | Present [4,5]                                                        |
| VGKC/LGI1 antibodies in serum and CSF        | Common (80–100%) [1,2]                        | Absent                                                              |
| MRI abnormalities                            | Present in 13–40% cases [1–3]                 | Present [4,5]                                                        |
| Ictal epileptiform discharges on scalp EEG   | High FLAIR signal or atrophy in bilateral medial temporal lobes however basal ganglia abnormalities more common in LGI1 with FBDS than without [3] | Usually normal in insular epilepsy [4,5], but our case had clear high FLAIR signal with volume loss in posterior Insula |

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