A case of amiodarone-induced dystonia in a patient with Parkinson’s disease

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Introduction
Amiodarone is a first line agent used to achieve rhythm control and is associated with several well-known side effects. Neurological side effects, however, are infrequently encountered.

We report a case of cervical dystonia that was time-linked with amiodarone administration in a patient with known Parkinson’s disease (PD). This reaction has not previously been reported in the literature related to amiodarone administration. Classification of dystonia as well as common and uncommon causes of dystonia are reviewed, including multiple pharmacologic agents known to cause dystonia.

Causes of Dystonia

- **Pathologic**
  - Degenerative: Progressive structural changes including neuronal loss
  - Static: Non-progressive neurodevelopmental anomalies or acquired lesions
- **Inherited**
  - Proven genetic origin
  - DYT classification dystonia
  - Inherited as AD, AR, X-linked, mitochondrial
- **Acquired**
  - Perinatal brain injury
  - Dystonic cerebral palsy infection
  - Viral encephalitis, HIV, TB
  - Drugs: Dopamine agonists, neuroleptics, anti convulsants, calcium channel blockers
- **Toxic**
  - Manganese, cyanide, methanol
- **Vascular**
  - Ischemia, hemorrhage
- **Neoplastic**
  - Paraneoplastic encephalitis
- **Brain injury**
  - Head trauma, surgery
- **Psychogenic**
  - Functional dystonia

Figure 1. Numerous different pathologies, both hereditable and acquired, can cause dystonia and should be considered when evaluating a new-onset dystonia. Source: Albanese et al

Hyperkinetic Movements

<table>
<thead>
<tr>
<th>Types of Dystonia</th>
<th>Cervical Dystonia</th>
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<tbody>
<tr>
<td>Torticollis</td>
<td>82% of patients</td>
</tr>
<tr>
<td>Lateral cervical movements</td>
<td>25% of patients</td>
</tr>
<tr>
<td>Antecollis</td>
<td>25% of patients</td>
</tr>
<tr>
<td>Retrocollis/backward</td>
<td>29% of patients</td>
</tr>
</tbody>
</table>

Table 3. Dystonia can affect multiple different body regions and can often be mis-diagnosed. Source: Tansey et al

Case Presentation

A 79-year-old female with a past medical history of Parkinson’s disease (PD) on carbidopa/levodopa, coronary artery disease, hypertension and Type 2 DM presented to the hospital with generalized weakness, dizziness and dysphagia.

Her hospital course involved cardiac catheterization in workup of chest pain which showed severe multi-vessel disease and required coronary artery bypass graft. Her carbidopa/levodopa was held for approximately 30 hours due to her dysphagia. Post-operatively she developed atrial fibrillation with rapid ventricular response and was loaded with intravenous and oral amiodarone to achieve rhythm control. During this time she was somnolent, however, examination was non-lateralizing, with cogwheeling rigidity and severe bradykinesia. Non-progressive CT head imaging was normal, and carbidopa/levodopa was restarted with significant reduction in her complaints the following day.

12-16 hours after carbidopa/levodopa was reintroduced, she began to have episodes of right head turn and gaze deviation associated with paucity of speech lasting several seconds to nearly one minute followed by a rapid return to normal. IV diphenhydramine and benzodiazepines were unsuccessful in aborting events. Her amiodarone infusion was stopped and repeat CT head and long-term video EEG monitoring was unrevealing. After discontinuation of the amiodarone infusion, her events did not cease immediately, but the frequency and duration decreased until cessation hours later.

In our case, a dopamine agonist withdrawal syndrome or akinetic crisis was suspected given missed doses of carbidopa/levodopa; however, bradykinesia and significant tremor improved after resumption and were no longer present at the time of the dystonic movement. It is important to note that amiodarone has previously been reported to have rare adverse effects such as action tremor, as well as extrapyramidal symptoms resembling parkinsonism. Given her lack of improvement after IV medications, negative video EEG and response to cessation of her amiodarone infusion was stopped and repeat CT head and long-term video EEG monitoring was unrevealing.

Cervical Dystonia

The evaluation of new acute-onset dystonia can be challenging, especially in a patient with pre-existing neurological condition such as PD or in hospitalized patients with significant vascular risk factors such as ours presented, which could cause acute vascular events. Workup of new-onset adult hyperkinetic movements should begin with a classification of the movement into tremor, chorea, dystonia, myoclonus, and tic (figure 2).

Cervical dystonia can be further described using several common postures (figure 3). Finally, etiology can be considered (figure 1) and worked up based on the acuity of presentation. Acute vascular events should be promptly evaluated for with imaging (i.e. CT head) and consideration of and consultation for electroencephalography (EEG) if there is high suspicion for seizure. Several medications, as listed, can be related to dystonia onset and should be evaluated for. Finally, further imaging such as MRI and genetic testing can be considered in select cases.

In addition, dopamine agonist withdrawal syndrome or akinetic crisis was suspected given missed doses of carbidopa/levodopa; however, bradykynesia and significant tremor improved after resumption and were no longer present at the time of the dystonic movement. It is important to note that amiodarone has previously been reported to have rare adverse effects such as action tremor, as well as extrapyramidal symptoms resembling parkinsonism. Given her lack of improvement after IV medications, negative video EEG and response to cessation of her amiodarone infusion, amiodarone-induced dystonia was the most likely diagnosis. We suspect that her threshold for developing these symptoms may have been reduced given that patients with PD can develop dystonia; however, this is the first report to our knowledge of a new-onset marked cervical dystonia time-linked with amiodarone administration.


![Figure 5. Common side effects of amiodarone. Source: Rosh Review](https://www.roshreview.com/blog/vodcast/the-rosh-reveal-the-rosh-reveal-ep17/)

References