Subacute combined degeneration (SCD) is a rare neurological outcome of vitamin B12 deficiency that leads to demyelination of the dorsal columns in the spinal cord.

**Symptoms of SCD:**
- Paresthesia
- Progressive weakness
- Sensory ataxia

**Causes of B12 deficiency:**
- Restricted diet
- Gastritis
- Surgical manipulation of the GI tract
- Inflammatory bowel disease
- Pernicious anemia

**Rare cause of SCD:** Nitrous oxide (N2O). These patients have normal levels of B12, but they present with SCD because N2O can lead to B12 inactivation.

**CASE SUMMARY**

Case: 35 year-old woman with two presentations for difficulty with ambulation and lower extremity numbness.

2017
- Symptoms:
  - Numbness and tingling in bilateral lower extremities
  - Difficulty with ambulation
- MRI (Figure 2)
- Conclusion: Suspected folate deficiency
- Treatment:
  - 3 days of steroids
  - B12 and folate replacement
  - Gabapentin
- Prognosis: Patient’s symptoms reportedly improved 2 weeks after discharge. Lost to follow-up thereafter.

2018
- Symptoms:
  - Ascending paraesthesias in bilateral lower extremities
  - Weakness in bilateral lower extremities
  - Difficulty with ambulation
- Physical Exam:
  - Diminished proprioception on toe and ankle manipulation
  - Diminished temperature and vibratory (at the bilateral malleoli) sensation.
- Conclusion: B12 inactivation
- Etiology: Intermittent “Whippet” use
- Treatment:
  - 3 days of steroids
  - B12 and folate replacement

**SUMMARY OF LAB DATA**

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
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<tbody>
<tr>
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<td>Suspicion</td>
<td>Folate Deficiency</td>
<td>B12 Inactivation</td>
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</table>

**REFERENCES**


**DISCUSSION**

**N2O utility:**
- Anesthesia
- Euphoria (Recreational use)

**Patients at risk for N2O use:**
- Younger population => “Whippets”
- Health care workers => Direct access to medical N2O

**Our patient’s presentation summary:**
- “Inverted-V sign” on MRI (Figure 2)
- Normal folate levels, elevated MMA, normal B12
- Recreational “whippet” use

**Conclusion:** SCD secondary to B12 inactivation in the setting of N2O use. Demyelination of the dorsal columns caused paresthesias, weakness, and proprioceptive loss on physical exam.

**Treatment:** B12 supplementation

**Prognosis:** Partial neurological recovery in most patients, although full recovery is possible. Our patient demonstrated near full recovery during the 2017 episode but only partial recovery at the 1 month follow-up after the 2018 hospitalization.

**Positive prognostic factors:**
- Early treatment
- Negative Romberg and Babinski’s sign
- Age <50
- MRI spine lesions involving <7 vertebral segments

**Take home point:** The neurological manifestations of vitamin B12 deficiency are well known. This case highlights the need to consider N2O recreational use, especially in younger patients presenting with symptoms concerning for deficiency yet with normal B12 levels.