

Subacute combined degeneration of spinal cord

Subacute combined degeneration of [spinal cord](#), also known as Lichtheim's disease, refers to degeneration of the posterior and lateral columns of the spinal cord as a result of [vitamin B12](#) deficiency (most common), vitamin E deficiency, and copper deficiency. It is usually associated with pernicious anemia.

[Nitrous oxide](#) (N₂O) is an anesthetic which oxidizes the [cobalt](#) ion of [vitamin B12](#), interfering with its function as a [coenzyme](#).

A comprehensive search of multiple databases was conducted, and information about patient characteristics, symptomatology, clinical work-up, and treatment was extracted from eligible articles. Univariate analyses were performed to identify predictors of poor neurological recovery following SCD.

32 studies, reporting 39 cases of nitrous oxide-induced SCD, were included through the screening process. These cases included 22 male patients and 17 female patients, with an average age of 51.3 years (SD 17.6). An etiology for subclinical B12 deficiency was determined in 31 reports; of these, 26 were due to vitamin malabsorption secondary to a gastrointestinal disorder. Duration of nitrous oxide exposure was described in 19 reports, and ranged from 30 min to 11 h. Univariate analysis failed to find an association between post-operative recovery and age ($p = 0.41$), sex ($p = 0.48$), positive MRI findings ($p = 0.42$), post-operative serum B12 ($p = 0.96$), post-operative hemoglobin ($p = 0.17$), type of surgery ($p = 0.58$), or post-operative high mean corpuscular volume ($p = 0.14$).

In patients with postsurgical myelopathy, surgeons should evaluate B12 status and consider the possibility that nitrous oxide could cause a subclinical B12 deficiency to become overt, particularly in patients with malabsorptive GI comorbidities. Treatment with B12 in this population can result in significant improvement of neurological function ¹⁾.

¹⁾

Patel KK, Mejia Munne JC, Gunness VRN, Hersey D, Alshafai N, Sciubba D, Nasser R, Gimbel D, Cheng J, Nouri A. Subacute combined degeneration of the spinal cord following nitrous oxide anesthesia: A systematic review of cases. Clin Neurol Neurosurg. 2018 Aug 9;173:163-168. doi: 10.1016/j.clineuro.2018.08.016. [Epub ahead of print] PubMed PMID: 30144777.

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Last update: 2024/06/07 02:55

