

Acute nutritional neuropathies in high-income countries requiring hospitalization: Systematic review

Search terms and strings

Search terms included: (“Neuropathy” or “Neuropathies” or “Peripheral neuropathy” or “Peripheral neuropathies” or “Polyneuropathies” or “Polyneuropathy” or “Nutritional neuropathy” or “Nutritional neuropathies” or “Acute neuropathy” or “Acute neuropathies” or “Paralytic neuropathy” or “Paralytic neuropathies” or “Paresis” or “Paraplegia”) and (“Malnourishment” or “Malnourished” or “Malabsorption” or “Avitaminosis” or “Vitamin deficiency” or “Vitamin deficiencies” or “Nutrient deficiency” or “Nutrient deficiencies” or “Dietary deficiency” or “Dietary deficiencies” or “Micronutrient deficiency” or “Micronutrient deficiencies” or “Nutritional derangement” or “Unbalanced nutrition” or “Dietary imbalance” or “Thiamin” or “Beriberi” or “Bariatric beriberi” or “Cobalamin” or “Vitamin B” or “Vitamin B12” or “Vitamin B6” or “Vitamin B1” or “Vitamin E” or “Multiple vitamin*” or “Folate” or “Copper” or “Electrolyte disturbances”. In each aspect, keywords are identified by reading previous clinical studies and systematic reviews regarding the subject. Keywords will be searched with MeSH terms and All Fields in PubMed. 31 “AND” was used between each aspect, and “OR” was used between each keyword (Figure 1) and see full search string (Appendix).

We included only articles on patients from high-income countries that allowed assessment of patient data at the single-subject level and that were published in English or Danish and registered in Medline (PubMed), Cochrane Central Register of Controlled Trials (The Cochrane Library), and Embase since 1990 and up to until December 2023.

We excluded articles that concerned patients with alcohol or nitric oxide abuse. We evaluated all abstracts and identified eligible studies based on full text review. This process was managed using Covidence (<https://www.covidence.org/>). EWJ and KTH performed initial selection and further review.

Uncertainties or disagreements were settled by DK. For all included records, all cross references were checked and the “cited by” function in PubMed was used to find additional relevant records. If an article were unavailable for full text online, a request was made for the item at the Royal Danish Library, Copenhagen, Denmark. After relevant studies were identified, KTH independently extracted relevant information. Figure S2 in the appendix shows data extraction points.

Target conditions

We registered causes of nutritional neuropathies, when available, including micronutrient deficiencies like thiamine deficiency, niacin deficiency, pyridoxine deficiency and excess, cyanocobalamin deficiency, pantothenic acid deficiency, alpha-tocopherol deficiency, celiac disease, and multifactorial mechanisms.

Statistical analysis

We used R (R Core Team, 2023; R-packages ‘tidyverse’, ‘dplyr’, ‘ggplot2’, and ‘haven’) for statistical analysis. Descriptive statistics were used to report demographics and frequencies. Since data did not meet the assumptions of normality or homogeneity of variance, non-parametric tests were used for comparing variables between patient groups. Chi-squared test was used to compare differences in categorical data, and Kruskal-Wallis test was used to compare differences in numerical data between patient sub-groups, p-values < 0.05 was considered statistically significant.

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Figure S1: PubMed search string

	Aspect 1: Acute neuropathies	Aspect 2: Malnutrition
MeSH Terms	Polyneuropathies Paraplegia Paresis	Malnutrition
All Fields	Neuropathy Neuropathies Peripheral neuropathy Peripheral neuropathies Polyneuropathies Polyneuropathy Nutritional neuropathy Nutritional neuropathies Acute neuropathy Acute neuropathies Paralytic neuropathy Paralytic neuropathies Paresis Paraplegia	Malnourishment Malnourished Malabsorption Avitaminosis Vitamin deficiency Vitamin deficiencies Nutrient deficiency Nutrient deficiencies Dietary deficiency Dietary deficiencies Micronutrient deficiency Micronutrient deficiencies Nutritional derangement Unbalanced nutrition Dietary imbalance Thiamin Beriberi Bariatric beriberi Cobalamin Vitamin B Vitamin B12 Vitamin B6 Vitamin B1 Vitamin E Multiple vitamin* Folate Copper Electrolyte disturbances

Outcome

- Treatment
- ICU
- Course
- Follow-up
- Outcome (mRS)
- Death

Figure S2: Data extraction flowchart

Demographics

- Sex
- Age
- Country
- Comorbidities
- Subacute onset
- Malnutritional risk factors

Symptoms and Clinical findings

- Cranial nerves
- Extremity power (MRC)
- Peripheral reflexes
- Sensation
- Autonomic symptoms
- Memory
- Systemic complications

Laboratory findings

- Blood tests
- CSF analysis
- MRI
- ENG/EMG
- EEG
- Evoked potentials

Table S1: Individual patient data on etiology, clinical course, symptoms and outcome at follow-up

Reference	Age	Sex	Risk factor	Clinical course and presentation	Diagnosis (NCS & MRI)	Micronutrient deficiency	Treatment	Follow-up time (mRS)
AlShareef, A 2019	21	F	3 months Post GI-surgery	3 weeks of weight loss, vomiting, distal LE weakness and loss of sensation, areflexia, respiratory failure (ICU)	Axonal sensory motoric polyneuropathy		Thiamin, IVIG B6, B12	8 months (2) Monophasic
	26	F	4 months Post GI-surgery	5 weeks of weight loss, vomiting, UE and LE weakness and loss of sensation, areflexia, respiratory failure (ICU)	Axonal sensory motoric polyneuropathy		Thiamin, IVIG B6, B12	18 months (2) Monophasic
	22	F	2 months Post GI-surgery	4 weeks of weight loss, vomiting, distal LE weakness and loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Thiamine deficiency	Thiamin, IVIG B6, B12	3 months (3) Monophasic
	65	M	8 months Post GI-surgery	3 weeks of weight loss, vomiting, distal LE weakness and loss of sensation, areflexia	Axonal sensory motoric polyneuropathy		Thiamin B6, B12	No follow-up Monophasic
	19	F	3 months Post GI-surgery	4 weeks of weight loss, proximal LE weakness and loss of sensation, areflexia	Axonal sensory motoric polyneuropathy		Thiamin B6, B12	3 months (3) Monophasic
	28	M	3 months Post GI-surgery	3 weeks of weight loss, vomiting, proximal LE weakness and loss of sensation, areflexia	Axonal sensory motoric polyneuropathy		Thiamin, IVIG B6, B12	3 months (3) Monophasic
	23	F	4 months Post GI-surgery	3 weeks of weight loss, vomiting, distal LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamine deficiency	Thiamin B6, B12	3 months (2) Monophasic
	41	F	4 months Post GI-surgery	2 weeks of weight loss, vomiting, distal LE weakness and loss of sensation	Axonal sensory motoric polyneuropathy		Thiamin, IVIG B6, B12	6 months (2) Monophasic
	27	F	7 months Post GI-surgery	3 weeks of weight loss, vomiting, distal LE weakness and loss of sensation	Axonal sensory motoric polyneuropathy		Thiamin B6, B12	3 months (2) Monophasic
	40	F	5 months Post GI-surgery	Subacute weight loss, vomiting, distal UE and LE weakness and loss of sensation, hyporeflexia	Axonal sensory motoric polyneuropathy		Thiamin B6, B12	2 months (2) Monophasic
	26	F	9 months Post GI-surgery	3 weeks of weight loss, vomiting, distal LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Thiamine deficiency	Thiamin B6, B12	3 months (2) Monophasic
	23	M	6 months Post GI-surgery	2 weeks of weight loss, vomiting, distal LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy		Thiamin B6, B12	3 months (3) Monophasic
	26	F	2 months Post GI-surgery	3 weeks of weight loss, vomiting, proximal LE weakness and loss of sensation	Axonal sensory motoric polyneuropathy	Thiamine deficiency	Thiamin, IVIG B6, B12	1 month (2) Monophasic
Al-Shubaili, AF 1998	35	M	Malabsorption	3 weeks of proximal and distal LE weakness, loss of sensation, areflexia, myelopathy, sphincter symptoms, ataxia	Axonal and demyelinating sensory motoric	Cobalamin deficiency	B12	5 months (2) Monophasic
Asiri, AA 2021	36	M	Post GI-surgery	1,5 week of weight loss, distal OE and LE weakness, loss of sensation, areflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE		Thiamin, IVIG	No follow-up Monophasic
Ba, Fang 2010	25	F	Post GI-surgery	2 weeks of weight loss, vomiting, distal LE weakness, loss of sensation, areflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE		Multivitamin	No follow-up Monophasic
	53	F	Post GI-surgery	1 week of weight loss, vomiting, distal LE weakness, loss of sensation, areflexia, myelopathy	Sensory motoric polyneuropathy + myelopathy		B12, IVIG	No follow-up Monophasic
Angstadt, JD 2005	42	F	Post GI-surgery	5 weeks of weight loss, distal LE weakness, loss of sensation, areflexia,	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	(<2) Monophasic
Chang, HW 2019	22	M	Post GI-surgery	0,5 weeks of weight loss, distal LE weakness, hyporeflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Folate deficiency	Thiamin, folic acid	(<2) Monophasic

Chua M 2021	51	F	Post GI-surgery	3 weeks of weight loss, vomiting, UE and LE weakness, hyporeflexia, diplopia, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Vitamin E, Zinc & Phosphate deficiency	Thiamin	(<2) Monophasic
Duran, B 2015	23	F	Post GI-surgery	0,5 weeks of weight loss, vomiting, distal UE and LE weakness, loss of sensation,	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	(<2) Monophasic
Essa 2011	72	M	Malnutrition	Weeks of weight loss, distal LE weakness, dilated cardiomegaly, dyspnea, loss of sensation, ophthalmoplegia, Wernicke's	Sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	(>3) Monophasic
Hamel J 2018	34	F	Post GI-surgery	8 weeks of weight loss, vomiting and diarrhea, distal LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Pyroxidine deficiency	Thiamin, copper	(<2) Monophasic
	22	F	Psychiatric, Bulimia	12 weeks of distal LE weakness and loss of sensation, areflexia	Axonal and demyelinating sensory motoric polyneuropathy		B1, folic acid	No follow-up Monophasic
	16	F	Psychiatric, Anorexia	6 weeks of distal LE weakness and loss of sensation, areflexia	Axonal and demyelinating sensory motoric polyneuropathy		Vitamin B complex	No follow-up Monophasic
	36	F	Post GI-surgery	9 weeks of distal LE weakness and loss of sensation, areflexia	Axonal and demyelinating sensory motoric polyneuropathy	Thiamin, Pyroxidine & copper deficiency	B1, B6, Copper	No follow-up Monophasic
Huang, CR 2011	22	M	Psychiatric	4 weeks of distal UE and LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Cobalamin deficiency	Cobalamin	3,5 months (2) Multiphasic
Huang, K 2019	59	M	Malnutrition	2 weeks of proximal and distal LE weakness, loss of sensation, areflexia, sphincter symptoms, myelopathy	Demyelinating motoric polyneuropathy + myelopathy	Copper & Vitamin E deficiency	Vitamin E, IVIG, copper, steroids	15 months (4) Monophasic
Koike H 2008	46	M	Post GI-surgery	1,5 weeks of proximal and distal UE and LE weakness, loss of sensation, areflexia, sphincter symptoms, ophthalmoplegia, Wernicke's, heart failure (ICU)	Axonal sensory polyneuropathy + WE	Thiamin deficiency	Thiamin	6 months (2) Monophasic
	33	M	Psychiatric	2 weeks of proximal and distal UE and LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	1 month (3) Monophasic
Mantero V 2021	47	F	Psychiatric	1 weeks of weight loss, abdominal pain, vomiting, proximal and distal LE weakness, areflexia, diplopia, dyspnea, tachycardia, Wernicke's	Axonal motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	12 months (5) Monophasic
Rosta, E 2008	22	F	Hyperemesis gravidarum	1 weeks of vomiting, dyspnea, tachycardia, proximal and distal LE weakness, loss of sensation, areflexia, nystagmus, Wernicke's	Axonal motoric polyneuropathy + WE		Thiamin	3 months (2) Monophasic
Mouallem M 2018	42	M	Post GI-surgery	1 week of vomiting, weight loss, LE weakness, loss of sensation, diplopia, vertigo, Wernicke's, left ventricular heart failure	Axonal motoric polyneuropathy + WE	Thiamin & copper deficiency	Multivitamins, IVIG, copper	No follow-up Multiphasic
Ohkoshi N 1994	18	F	Hyperemesis gravidarum	1 week of vomiting, proximal and distal UE and LE weakness, areflexia, ataxia, nystagmus, Wernicke's, respiratory failure (ICU)	Axonal sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	2 months (3) Monophasic
Renthal, W. 2014	-	M	Psychiatric	4 weeks of weight loss, proximal and distal UE and LE weakness, loss of sensation, areflexia, ataxia, diplopia, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Thiamin & Folate deficiency	Thiamin and vitamins.	3 months (4) Monophasic
Shible A 2019	56	F		4 weeks of proximal and distal UE and LE weakness, areflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE		Thiamin, IVIG	No follow-up Monophasic
Riahi A 2017	14	F	Psychiatric	4 weeks of weight loss, proximal and distal UE and LE weakness, loss of sensation, areflexia,	Axonal and demyelinating	Thiamin deficiency	Thiamin	1 month (2) Monophasic

Ryan P 2021	55	F	Post GI-surgery	1 week of proximal and distal LE weakness, areflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Thiamin, Vit, E & copper deficiency	Thiamin and vitamins, IVIG, steroids	4 months (2) Monophasic
Scarano V 2012	27	F	Post GI-surgery	1 week of proximal and distal UE and LE weakness, loss of sensation, areflexia, nystagmus, diplopia, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin and vitamins.	6 months (3) Monophasic
Spinazzi M 2007	62	F	Post GI-surgery	4 weeks of UE and LE weakness, loss of sensation, sphincter symptoms, ataxia, hyposmia, blurred vision, myopathy	Axonal motoric polyneuropathy	Copper deficiency	IVIG, copper	No follow-up Multiphasic
Yasawi ZM 2017	21	F	Post GI-surgery	6 weeks of weight loss, vomiting, UE and LE weakness, loss of sensation, areflexia,	Axonal sensory motoric polyneuropathy	Folate deficiency	Thiamin, B12, Vit E, folic acid	1 month (1) Monophasic
	25	F	Post GI-surgery	4 weeks of vomiting, distal UE and LE weakness, loss of sensation, areflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE		Thiamin and calcium	4 months (3) Monophasic
	23	F	Post GI-surgery	4 weeks of distal UE and LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Cobalamin deficiency	Thiamin and vitamins	4 months (1)
Zara G 2012	29	F	Hyperemesis gravidarum	8 weeks of weight loss, hematemesis, vomiting, diarrhea, UE and LE weakness, loss of sensation, areflexia, exophthalmos, nystagmus, Wernicke's, respiratory failure, sepsis	Axonal sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	No follow-up Monophasic
Koike H 2001	46	M	Post GI-surgery	4 weeks of distal UE and LE weakness, areflexia, sphincter symptoms, dyspnea	Axonal and demyelinating sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	42	M	Post GI-surgery	8 weeks of distal and proximal UE and LE weakness, areflexia, sphincter symptoms	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	50	F	Post GI-surgery	4 weeks of distal and proximal UE and LE weakness, areflexia, sphincter symptoms	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	54	F	Post GI-surgery	4 weeks of distal and proximal UE and LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	52	F	Post GI-surgery	3 weeks of distal and proximal UE and LE weakness, areflexia, sphincter symptoms, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	No follow-up Monophasic
	68	M	Post GI-surgery	8 weeks of distal and proximal UE and LE weakness, areflexia, sphincter symptoms, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	No follow-up Monophasic
	66	F	Post GI-surgery	4 weeks of distal and proximal UE and LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	61	M	Post GI-surgery	3 weeks of distal and proximal UE and LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	66	F	Post GI-surgery	4 weeks of distal and proximal UE and LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	68	M	Post GI-surgery	0,5 weeks of distal and proximal UE and LE weakness, areflexia, Wernicke's	Axonal sensory motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	No follow-up Monophasic
	48	M	Post GI-surgery	4 weeks of distal and proximal UE and LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	67	M	Post GI-surgery	4 weeks of distal and proximal UE and LE weakness, areflexia	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
Tsao WC 2017	48	M	Post GI-surgery	12 weeks of distal and proximal UE and LE weakness, areflexia, sphincter symptoms	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
	66	M	Post GI-surgery	4 weeks of weight loss, distal and proximal UE and LE weakness, loss of sensation, areflexia, oculophthalmoplegia, ataxia, Wernicke's, respiratory failure, cardiomegaly (ICU)	Axonal sensory motoric polyneuropathy + WE		Thiamin and vitamins, PLEX	24 months (4) Monophasic

	70	F	Post GI-surgery	1 week of vomiting, distal and proximal UE and LE weakness, areflexia, ophthalmoplegia, Wernicke's, mild cardiomegaly	Axonal sensory motoric polyneuropathy + WE		Thiamin	9 months (4) Monophasic
Chen MH 2015	31	F	Post GI-surgery	1 week of vomiting, tetraplegic, complete paralysis, areflexia, blurred vision, Wernicke's, mild cardiomegaly, Shock (ICU)	Motoric polyneuropathy + WE	Thiamin deficiency	Thiamin	2 months (5) Monophasic
Iannelli A 2010	27	F	Post GI-surgery	0,5 weeks of weight loss, vomiting, distal and proximal UE and LE weakness, areflexia, sphincter symptoms, diplopia, nystagmus, Wernicke's	Motoric polyneuropathy		Thiamin	12 months (0) Monophasic
Landais A 2014	52	F	Post GI-surgery	4 weeks of vomiting, distal and proximal UE and LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Thiamin & Pyridoxine deficiency	Thiamin	6 months (1) Monophasic
	-	M	Post GI-surgery	Few weeks of vomiting and weight loss, distal and proximal UE and LE weakness, areflexia, diplopia, amnesia, Wernicke's	Axonal sensory motoric polyneuropathy	Thiamin & Folate deficiency	Thiamin	5 months (5) Monophasic
Hamel J 2023	35	F	Post GI-surgery	4 weeks of weight loss, Wernicke's encephalopathy, tachycardia	Axonal polyneuropathy	Pyridoxine deficiency	Thiamin	22 months (2) Monophasic
	53	F	Psychiatric	Few weeks of weight loss, Wernicke's encephalopathy, tachycardia	Axonal polyneuropathy	Thiamin, Pyridoxine & Copper deficiency	Thiamin	39 months (3) Monophasic
	57	F	Psychiatric	3 weeks of vomiting and weight loss	Axonal polyneuropathy	Pyridoxine deficiency	Thiamin	No follow-up Monophasic
	69	F	Psychiatric	5 weeks of weight loss	Axonal polyneuropathy	Thiamin & Pyridoxine deficiency	Thiamin	24 months (3) Monophasic
	51	F	Psychiatric	12 weeks of vomiting, diarrhea and weight loss	Axonal polyneuropathy	Thiamin, copper & Pyridoxine deficiency	Thiamin	7 months (3) Monophasic
	34	F	Post GI-surgery	8 weeks of tachycardia, weight loss, diarrhea, vomiting	Axonal polyneuropathy	Pyridoxine deficiency	Thiamin	83 months (3) Monophasic
	22	F	Psychiatric	12 weeks of vomiting, diarrhea and weight loss	Axonal polyneuropathy	-	Thiamin	87 months (3) Monophasic
	16	F	Psychiatric	6 weeks of vomiting, diarrhea and weight loss	Axonal polyneuropathy	-	Thiamin	27 months (1) Monophasic
	36	F	Post GI-surgery	9 weeks of vomiting, diarrhea and weight loss	Axonal polyneuropathy	Thiamine & copper deficiency	Thiamin	41 months (3) Monophasic
	30	F	Post GI-surgery	4 weeks of vomiting, tachycardia and weight loss	Axonal polyneuropathy	Thiamine & Pyridoxine deficiency	Thiamin	14 months (3) Monophasic
	48	F	Post GI-surgery	Few weeks of vomiting, diarrhea and weight loss	Axonal polyneuropathy	Copper deficiency	Thiamin	5 months (3) Monophasic
	45	F	Psychiatric	12 weeks of vomiting, tachycardia, diarrhea and weight loss	Axonal polyneuropathy	Thiamine & Pyridoxine deficiency	Thiamin	7 months (3) Monophasic
	38	M	Post GI-surgery	6 weeks of vomiting, tachycardia and weight loss	Axonal polyneuropathy	Thiamine deficiency	Thiamin	5 months (1) Monophasic
	52	F	Post GI-surgery	2 weeks of tachycardia and weight loss	Axonal polyneuropathy	Thiamine & Pyridoxine deficiency	Thiamin	4 months (1) Monophasic
	34	F	Psychiatric	1 week of vomiting, tachycardia and weight loss	Axonal polyneuropathy	Cobalamin & Pyridoxine deficiency	Thiamin	5 months (1) Monophasic

Jindal A 2021	26	F	Post GI-surgery	4 weeks of vomiting and weight loss, distal and proximal UE and LE weakness, loss of sensation, nystagmus, Wernicke's	Axonal sensory motoric polyneuropathy	Thiamin & copper deficiency	Thiamin, copper, IVIG, steroids, gabapentin	18 months (1) Multiphasic
Samanta D 2015	17	F	Post GI-surgery	3 weeks of double vision, weight loss, distal and proximal UE and LE weakness, areflexia, loss of sensation, sphincter symptoms, Wernicke's (ICU)	Axonal sensory motoric polyneuropathy	Thiamin deficiency	Thiamin	No follow-up Monophasic
Huertas-Gonzalez N 2015	70	M	Malabsorption (gastric phytobezoar)	3 weeks of bilateral horizontal nystagmus, diplopia, truncal ataxia, dysmetria, distal and proximal UE and LE weakness, loss of sensation, areflexia	Axonal sensory motoric polyneuropathy	Folate deficiency	Thiamin, folic acid, IVIG	5 months (1) Multiphasic
Lin I 2011	24	F	Post GI-surgery	5 weeks of distal and proximal UE and LE weakness	Axonal sensory motoric polyneuropathy		Thiamine, Sodium Pantothenate	No follow-up
Hegde N 2021	27	F	Hyperemesis gravidarum	9 weeks of distal and proximal UE and LE weakness, areflexia, nystagmus, Wernicke's, respiratory weakness (ICU)	Axonal motoric polyneuropathy	Thiamin deficiency	Thiamin, agomelatine, memantine	No follow-up Monophasic

Table S2: Reviewed publications on nutritional neuropathies by region

Region HIC	Country	Number studies	Study design (number of patients included per study)	Years published
Middle East	Saudi Arabia	3	Retrospective chart review (13), Case report (1), Case report (1)	2017, 2019, 2021
	Kuwait	1	Case report (1)	1998
	Israel	1	Case report (1)	2018
	Iran	1	Case report (1)	2017
Europe	England	1	Case report (1)	2021
	France	1	Case report (2)	2014
	Italy	6	Case report (1), Case report (1), Case report (1), Case report (1), Case report (1), Case report (1)	2007, 2008, 2010, 2012, 2012, 2021
	Ireland	1	Case report (1)	2021
	Spain	1	Case report (1)	2015
North America	USA	11	Case report (1), Case report (1), Case report (1), Retrospective chart review (4), Case report (1), Case report (1), Review and case report (1), Retrospective chart review (15), Case report (1), Case report (1), Case report (1)	2005, 2011, 2014, 2015, 2015, 2018, 2019, 2019, 2019, 2021, 2023
	Canada	1	Review and case reports (3)	2010
Asia	Taiwan	4	Case report (1), Case report (2), Case report (1), Case report (1)	2011, 2011, 2015, 2017
	Japan	3	Retrospective chart review (13), Case report (1), Case report (2)	1994, 2001, 2008
	Singapore	1	Case report (1)	2021

Table S3: Laboratory findings Studies according to micronutrient deficiency

Blood Samples			Electrophysiology			Magnetic Resonance Imaging		
Micronutrient	Measured N	Deficit N	Motor	Sensor	Mixed	Measured N	Wernicke's	Myelopathy
Thiamin	49	45	3	1	33*	36	21	1
Pyroxidine	21	13			3*	3	3	
Copper	24	10	3*		4*	7	4	4
Folate	24	6			5	5	3	
Cobalamin	57	3			3*	3		1
Vitamin E	18	3	1*		2	3	1	
Zinc	24	1			1		1	1

*Patients with demyelinating features (Slowing conduction velocity and prolonged F-waves): Thiamin = 14, Pyroxidine = 1, Copper = 2, Cobalamin = 1, Vitamin E = 1.