NUTRITIONAL IMPLICATIONS IN NEUROLOGICAL DISORDERS
Food For Thought

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LORENZO’S OIL

SOME PEOPLE MAKE THEIR OWN MIRACLES.
LORENZO’S OIL

- 4:1 mix of erucic acid and oleic acid
- Extracted from rapeseed oil and olive oil
- Designed to normalise the accumulation of the very long chain fatty acids in the brain
- Thereby halting the progression of ADRENOLEUKODYSTROPHY
- Available to patients taking part in a clinical trial
- Specific to ALD
- Does not repair myelin
- Doesn’t affect other dysmyelinating disorders
- May prevent the disease in presymptomatic boys
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VITAMIN B12 DEFICIENCY

- Can cause damage to CNS if not treated for longer than 6 months

- Humans obtain almost all B12 from dietary means

- Pernicious anemia is usually the result of insufficient secretion of intrinsic factor within the stomach
Till recently, it was widely believed that B12 deficiency was due to dietary factors.

Now, it is well known that improper absorption may be more important than low consumption.
STORAGE AND LEVELS

- Total B12 stored: 2-5mg
- 50% in the liver
- 0.1% lost each day
- Liver can store 3-5 years worth of vitamin B12 under usual conditions
5 MTHF releases a methyl group for a reaction with homocysteine, resulting in methionine.

This reaction requires cobalamin as a co-factor.

Methionine ➔ S-adenosyl methionine ➔ aids in purine and pyrimidine synthesis, neurotransmitter production, DNA methylation.
Both B12 and folate are involved in homocysteine metabolism.

Therefore hyperhomocysteinemia is a non-specific marker of B12 deficiency.

Methylmalonic acid is a more specific marker.
PATHOMORPHOLOGY

- Spongiform state of neural tissue, edema of fibers
- Myelin decay, later axonal degeneration
- Later, fibrous sclerosis of nervous tissue
- Dorsal cord and pyramidal tracts ➔ SACD
SUBACUTE COMBINED DEGENERATION

dorsal root comes out here
gracile tract
cuneate tract
anterior horn
anterior median fissure

= זאור הפרע
CLINICAL FEATURES

- Anemia
- GI symptoms
- Sensory and motor symptoms
- Dementia
- Psychiatric symptoms
MYELOSIOS FUNICULARIS

Impaired perception of deep touch, pressure and vibration, abolishment of sense of touch, paresthesias

- Sensory ataxia
- Decreased ankle jerk
- Increased knee and other DTRs
B12 deficiency can cause severe and irreversible CNS damage

The chance of complete reversal decreases with the length of time the neurological symptoms have been present
CAUSES OF B12 DEFICIENCY

- Inadequate dietary intake
- B12 occurs in animal products
- In some algae (chlorella and susabi-nori)
- Vegans at a high risk
IN CHILDREN

- Children are at a higher risk
- Due to inadequate dietary intake
- Have fewer vitamin stores
- Relatively larger vitamin need per calorie of food intake
Selective impaired absorption of B12 due to intrinsic factor deficiency

May be caused by loss of gastric parietal cells

Surgical resection of stomach

Malabsorption syndromes, esp terminal ileum involvement
- Achlorhydria is an important cause in the elderly
- Prolonged use of ranitidine
- Bariatric procedures
- Blind loop syndromes
- Metformin
- Alcoholism
TREATMENT DILEMMAS

- B12 available in various forms → cyanocobalamin, hydroxococobalamin, methylcobalamin, adenosylcobalamin
- Usually given parenterally
- Oral absorption poor
Food sources of vitamin B12:

Eggs, meat, poultry, shellfish, milk and milk products
DIETARY SOURCES

- Animal products
- High B12 content

- Mussels
- Mackerel
- Herring
- Salmon
- Crab
- Tuna
- Beef
- Lobster
- Lamb
- Swiss cheese

- Eggs have a low bio-availability of B12 content
Some fermented foods contain B12
- Kombucha cultured tea
- Batabata-cha
- Fortified foods with B12
- Some algae
NUTRITIONAL NEUROPATHIES

- Thiamine deficiency
- Pyridoxine deficiency
- Niacin deficiency
- Pantothenate deficiency
- Alcoholism
NEUROCYSTICERCOSIS

- NCC is the result of accidental ingestion of eggs of Taenia solium
- Most common parasitic disease of the nervous system in developing countries
- Main cause of acquired epilepsy
FEATURES OF NCC

- Epilepsy
- Headache, dizziness
- Stroke
- Neuropsychiatric dysfunction
CT findings

- Vesicular stage
- Colloidal stage
- Nodular-granular stage
- Cysticercal encephalitis
- Active parenchymal stage
- Calcified stage
TRANSMISSION

- Ingestion of measly pork
- Contaminated vegetables
- Auto-ingestion (fecal-oral)
Migraine Triggers
Coffee!

Is the planet shaking or is it just me?
THE ROLE OF DIET IN MIGRAINE HEADACHES

- Foods that may trigger migraine attacks
  - Aged or strong cheese
  - Cured meats
  - Citrus fruits
  - Fatty or fried foods
  - Chocolate, nuts
  - MSG
  - Ice cream
  - Sea food
  - Caffeine containing drinks
  - Alcohol
  - Aspartame
The culprit chemicals are usually tyramine and other amines.

- Phenylethylamine and histamine also play a role.

- Tyramine ➔ Cheese
- Phenylethylamine ➔ Chocolate
- Octopamine ➔ Citrus fruits
- Histamine ➔ Red wine and beers
- Caffeine addiction and withdrawal
- Fasting or skipping meals
I'm on a seafood diet, I see food and I eat it.
THANK YOU