Integrative Approach for Patients with Intracranial Hypotension

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SIH disabling symptoms

- positional headache
- limits upright time
- nausea
- brain fog
- imbalance
- other symptoms
the gap in time...

onset → diagnosis → treatment(s) → better

days... weeks... months... years... decades
... while waiting for "better"

Let's focus on what we CAN do to improve function + quality of life and maybe optimize outcomes
"Integrative medicine and health reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic and lifestyle approaches, healthcare professionals and disciplines to achieve optimal health and healing."

Definition by the Academic Consortium of Integrative Medicine & Health

Key Principle:

Integrative medicine neither rejects conventional medicine nor accepts complementary therapies uncritically."
Why integrative (multi-modal) approaches?

- Simple problems respond well to single therapies
- Complex, chronic diseases respond better when multiple therapies are combined
  - Hypertension
  - Diabetes
  - Chronic pain (national shift to integrative model)
  - Many other disorders
the gap in time...

onset ➔ diagnosis ➔ treatment(s) ➔ better

days... weeks... months... years... decades
Goals:
- reduce severity of symptoms + improve function
- support the brain
- support ability to compensate for low CSF-volume
- support tissue healing

... an integrative approach makes sense
Integrative approaches for patients with intracranial hypotension

- treat underlying problem
  - spinal injections + surgery
- position change
- hydration
- tincture of time
- medications (Rx and OTC)
- assistive devices (compression garments)

- address co-morbid disorders
- nutrition
- supplements
- physical activity + physical therapy
- mind-body
- sleep
- other therapies
Fatigue, brain fog

- look for and address other underlying causes
  - iron deficiency with or without anemia
  - other nutritional deficiencies
  - hormone dysfunction: hypothyroidism, hypocortisolism
- consider co-morbid diseases
- pain control
- adequate sleep
- physical activity
Nutrition for patients with intracranial hypotension
Nutrition

- Can diet reduce pain?
- Can diet support the brain?
- Can diet reduce risk of depression or anxiety?
- Can diet support tissue healing?
What diet?

- Mediterranean
- DASH = Dietary Approaches to Stop Hypertension
- MIND = Mediterranean-DASH Intervention for Neurodegenerative Delay
- Okinawan
- Nordic
- Traditional West African
- Traditional Latin American
- Vegetarian
- Vegan
- Paleo
- Ketogenic
- Food elimination
  - gluten or all grains
  - dairy
  - low FODMAP
wading thru the confusion...

- nutrient density
  - higher intake of flavonoids correlates with risk reduction for all diseases
- too much sugar and processed grain >> insulin resistance
  - tissue repair
- diet impacts inflammation levels
  - higher pain scores
  - depression, anxiety, many chronic diseases
- gut flora *
- macronutrient ratios: FAT, CARBS, PROTEIN vs quality
  - tissue repair requires essential fatty acids + essential amino acids + co-factors
**Mediterranean diet**

* the most well-studied dietary pattern

### Cardiovascular Risk Reduction
- heart disease
- stroke
- hypertension
- dyslipidemia

### Lower Overall Mortality

### Other Risk Reduction
- cancers
- dementia; brain aging
- Parkinson’s
- obesity
- diabetes
- autoimmune diseases
- low levels of pain / disability
Mediterranean diet features

**anti-inflammatory, nutrient-dense**

- abundant vegetables + fruit
- abundant legumes (beans, lentils)
- includes fish (n-3 fats); some poultry; less meat, minimal processed meats
- modest amount of dairy, mainly as cheese, yogurt; some eggs
- main oil is olive oil; low in n-6 fats (soy, corn, sunflower, safflower); modest in saturated fats; zero trans fat
- whole grains but lower in processed grains
- minimal added sugar + sweeteners
- some nuts, herbs + spices
- red wine
What to eat, or not

**eat**
- “eat food, not too much, mostly plants” - Michael Pollan
- unadulterated, minimally processed foods
- pay attention to nutrient-density
- **wide variety of colors (plants)**
- pay attention to glycemic load
- organic

**avoid or minimize**
- avoid artificial sweeteners
- avoid trans fat
- avoid food-like substances
- avoid most processed foods, meats
- minimize sugar
- minimize flour products
- minimize fried foods
What to eat (cont’d)

**eat**
- veggies – include cruciferous family, onion/garlic family, greens, legumes, roots, others (variety)
- fruits – include berries, variety
- include protein sourced from plants; source animal-based proteins with care
- fats – primarily olive oil
- fermented foods
- nuts & seeds
- herbs & spices

**eat if desired + tolerated**
- dairy (cow, goat, sheep, etc) – fermented forms preferred (kefir, yogurt, cheese)
- grains – less processed preferred; some need to eliminate gluten grains; variety (rice, quinoa, etc)
- eggs
- bone broths
- coffee, teas, chocolate
- wine
Physical Activity for patients with intracranial hypotension
Symptoms worsened by

- upright posture
- bending
- lifting (even modest weights)
- twisting / rotation of spine
- stretching
- core engagement
- bouncing, bumps
Physical Activity Challenges

- LONG list of physical limitations
- deconditioning
  - difficult to avoid or reverse
  - might reduce ability to compensate physiologically for low CSF volume
  - worsens dysautonomia (PoTS, orthostatic intolerance)
- impaired balance is common
- strong core supports intracranial pressure but must limit core exercise
- often need to exercise in short windows of time
Physical Activity & Health Outcomes

- **cardiovascular** (BP, lipids, heart disease, stroke, autonomic function, venous return)
- **endocrine** (insulin resistance / diabetes, growth hormone, fat mass)
- **musculoskeletal** (osteoporosis, joint ROM, posture, muscle mass / strength)
- **neurologic** (dementia, memory / learning, balance, coordination, sleep, PAIN)
- **psychologic** (depression, anxiety, stress)
- **immune function** (unless exercise is excessive)
- **gastrointestinal function** (gut motility, gut flora)
- **mitochondrial function** (energy, metabolism)
- **cancer** (risk; improved survival)
Goals
more time upright
less PAIN
BRAIN benefits:
cognition
mood, stress
sleep
balance
more energy
etc.

- aerobic conditioning
- core strength
- balance
- muscle strength
what exercise CAN we do?
in that gap until “better”

work with a physical therapist to customize a program for you
balance restrictions and goals

consider

exercise in bed is possible
aerobic exercise early when CSF tank is full
short sessions count; high intensity intervals if tolerated
compression garments might help
Aerobic conditioning

- walking (without or with incline)
- stair climbing
- recumbent bicycle or stepper
- pool-running

- avoid
  - running (on land)
  - swimming (spine rotation)
  - rowing
Pool-running (or walking)

- **underwater treadmill**
- **water depth to chest or shoulders**
  - hydrostatic pressure increases intracranial pressure such that upright posture is better tolerated
- **resistance jets**
  - increase workload
  - gentle balance challenge
  - gentle core engagement
Pool-running (or walking)
balance trainer

- balance
- core
- strength (lower extremities)
- (aerobic)
**Balance / Core / Strength**

**Balance**
- pool-running
- balance trainer
- Tai Chi

**Core (gentle)**
- pool-running
- balance trainer
- other (even in bed)

**Strength / Resistance (caution)**
- upper vs lower extremity
- weights +/- resistance bands

**Stretching (avoid)**
- avoid anything that stretches or rotates spine
- be careful with some yoga poses, pilates
- patients with heritable disorders of connective tissue – any stretching may be risky
Exercise for dysautonomia patients

PoTS - postural tachycardia syndrome
OI - orthostatic intolerance

► pool walking or running
► other pool therapy
► recumbent bicycle or stepper
► lower extremity strengthening (improve blood return)
► core strengthening