Nutritional Considerations in Patients with Parkinson’s Disease

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Nutritional Considerations in Patients with Parkinson's Disease

Overview of PD

- Chronic progressive neuromuscular disease with no known cure
- Dopamine-producing neurons in substantia nigra portion of brain are affected
- 80-85% of all PD cases occur after age 60
- Men 50% more likely than women to acquire PD after age 70
- Approximately 1% of Americans over 70 have PD
- Average life expectancy following diagnosis of PD is 13 years.
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Biochemistry of PD

Tyrosine → DOPA

Tyrosine-hydroxylase → DOPA-decarboxylase

Tyramine → Dopamine

Tyramine-decarboxylase → Dopamine-dehydroxylase

Octopamine → Norepinephrine

Octopamine-β-hydroxylase → Norepinephrine-β-hydroxylase
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Neuroanatomy of PD

Median section of the brain

- Central sulcus
- Parietal lobe
- Parieto-occipital sulcus
- Occipital lobe
- Frontal lobe
- Corpus callosum
- Lateral ventricle
- Thalamus
- Hypothalamus
- Midbrain
- Temporal lobe
- Medulla oblongata
- Pons
- Cerebellum
- Spinal cord

wiseGEEK
Suspected Etiologies

- Genetic mutation
- Environmental toxins
- Oxidative stress
- Protein malformations (prions)
- Mitochondrial dysfunction
- Altered inflammatory response in brain
- Neurotransmitter imbalance
- ↓capacity to regenerate dopaminergic neurons
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Cognitive & Behavioral Signs & Symptoms

• Cognitive dysfunction
• Memory loss
• Depression
• Sensory dysfunction
• Sleep disturbances
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Pathognomonic (Motor) Signs & Symptoms

Acronym “T-R-A-P”

T = tremors
R = rigidity
A = akinesia
P = postural instability
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Two Main Categories of Nutrition-Related Symptoms

- Gastroparesis
  - hemorrhoids
  - fecal impaction
  - constipation

- Muscle dysfunction
  - dysphagia
  - GERD
  - delayed absorption of nutrients and medications
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Medical Treatment – Medications:

- L-dopa
- Enzyme inhibitors
- Dopamine agonists
- Anticholinergics
- Combination meds (Sinemet) =”gold standard.”
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Medical Treatment – **Surgery:**

- Deep brain electrical stimulation
- Embryonic cell implantation
- Radical “-otomies”
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Medical Nutrition Therapy

• Goal: Prevent and treat malnutrition

• Unintentional weight loss occurs from ↑energy needs due to tremors and bradykinesia plus ↓nutritional intake from
  • ↓smell, taste, appetite
  • Cognitive impairment/dementia
  • Depression – situational and neurochemical
  • Oropharyngeal dysphagia
  • Medications and side effects
  • Fatigue/apathy
Malnutrition in PD patients associations with:

- ↓ quality of life
- ↑ morbidity and mortality
- delayed wound healing
- ↑ risk of falls and osteoporosis
- lengthier hospitalizations
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Risk Factors for Malnutrition in PD Patients:

- Age
- Solitary living
- Polypharmacy
- Dementia
- Co-morbidities
- Depression
- ↓ capacity for ADLs
- Anorexia
- GI disturbances
  - Dysphagia
  - Gastroparesis
  - Constipation
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**Nutrition Care Process in PD:**

- **Six Common Diagnoses**
  - Inadequate Oral Intake
  - Involuntary weight loss
  - Consumption and Motility Dysfunction
  - Diminished capacity for independent food acquisition and preparation
  - Nutrient-medication interactions
  - Inadequate fluid intake and dehydration
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Nutrition Intervention in PD:

- Providing patient with high-fiber, plant-based, well-balanced diet with smaller portions of high-protein foods.
Considerations in Nutrition Interventions

- Calorie and protein needs
- Food preferences
- ↑nutrient density
- Textural modifications
- Safe and supportive environment
- Encouraging ↑PO intake
- Nutrition support
- Dental examination and treatment
- Adaptive equipment
- ↑fluid intake
- Adjusting timing of medication
- Addressing constipation
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Supplementation

- Ca, Mg, Vit D, Vit K – osteoporosis
- B6, B12, folate, CoQ10 – metabolism
- Vit C, Vit E, black tea – antioxidants
- L-tyrosine and iron sulfate (dopamine biosynthesis)
- Caffeine - ↓risk?
- EFAs – cell membrane protection
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Monitoring and Evaluation

- Weight
- PO intake
- Appetite
- Food preferences
- Adaptive equipment
- Labs
- Meds
- Skin
- GI: N/V/D/C, gastroparesis, pain, dysphagia, GERD
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Areas of Research

• Diet quality, ketogenic diets
• Nutraceuticals
• Nutragenomics
• Gluten intolerance and PD
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Overview of “Patient” J.M.

- 82-year-old Caucasian male
- Resident of St. Francis Country House (neuro-rehab)
- Admitted to St. Francis 4/3/2007 with primary diagnosis of PD
- Original diagnosis of PD approximately 10 years earlier (around age 65)
- 64” tall, 141 lbs.
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J.M.’s Past Medical History

- Dementia with Lewy bodies
- Anemia
- Osteoporosis
- Hyperlipidemia
- Cardiac pacemaker
- Syncope
- Hypothyroidism
- GERD
- Abdominal aneurysm without evidence of rupture
- Gait abnormality
- Paralysis Agitans
- Altered mental status
- Atrial fibrillation
- Hypertension
- Gout
- Oropharyngeal dysphagia
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J.M.’s Medications

- Sinemet (Parkinson’s Disease)
- Aricept and Seroquel (dementia)
- Dilantin (convulsions)
- Gabapentin (seizures)
- Aspirin (syncope)
- Calcium + Vitamin D (osteoporosis)
- Colace, Magnesium Oxide, Senna-Gen (constipation)
- Folic Acid and MVI with iron (anemia)
- Phos-NaK (mineral supplement)
- Vitamin B12 (vitamin supplement)
- Levothyroid (hypothyroidism)
- Nasonex (rhinitis)
- Nexium (GERD)
- Simvastatin (hypercholesterolemia)
- other prn meds
J.M.’s Most Current Quarterly Assessment

• WEIGHT=141 lbs

• UBW=135-145 lbs

• No significant weight change X 30 X 90 X 180 days

• BMI = 24, WNL
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J.M.’s Most Current Quarterly Assessment

- DIET ORDER:
  - mechanical soft
  - hydration program: an additional eight ounces of fluid at each meal
  - fortified food therapy: additional calories from fats and carbohydrate sources which are infused into soups, mashed potatoes, puddings, and cereals.
  - tolerated without difficulty
  - house supplement provided is Resource, 4 oz, q.i.d., which provides 2 kcal/mL and 0.8 g protein/mL, resident consumes 100%
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J.M.’s Most Current Quarterly Assessment

• PO INTAKE: generally 76-100% of meals consistently consumed.

• APPETITE: good to excellent

• Resident still capable of feeding himself but requires more assistance and needs help with meal set-up.

• No adaptive equipment required.
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J.M.’s Most Current Quarterly Assessment

• PHYSICAL AND MENTAL FUNCTIONING:
  • out of bed with assistance
  • motor agitations (tremors, wandering)
  • taste and sensory changes
  • sometimes unable to communicate needs

• LABS: all current nutrition-related labs WNL

• MEDS: reviewed, no changes since last assessment

• GI: no changes noted

• SKIN: no wounds noted
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Summary

• Role of R.D. as member of interdisciplinary team

• Value of Nutrition care Process

• Update on J.M.:
  • a. weight stable
  • b. no untoward events
  • c. continued good-to-excellent PO intake and appetite
  • d. no new GI or skin issues
  • e. disgusted with the Phillies!
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THANK YOU!!!

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