Gerontology

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EXCERPTS

Gerontology

“Wrinkles should merely indicate where smiles have been.” ~Mark Twain

Part I-BASIS OF AGING

DEFINITIONS on AGING

Aging: the gradual structural changes that occur over time and are not caused by pathology (disease); process of gradual maturation;
Geriatrics: branch of medicine dealing with problems of the aging and diseases of the elderly;
Gerontology: the scientific study of all aspects related to aging;
Life expectancy: how long, on average, a human being is expected to live;
Lifespan: the period of time in which the life events of a species occur;
Longevity: the period of time an organism is expected to live under ideal circumstances;
Senescence: the fundamental process of aging, in which the capacity of cell division and functions are lost over time.
### General appearance

- Pale, drained, recent weight loss may suggest neoplasia;
- Sadness, crying, eating disorders may suggest depression;

### Integumentary system

<table>
<thead>
<tr>
<th>Skin itching</th>
<th>Jaundice, uremia*, cancer, dehydration;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruising</td>
<td>Trauma (from falls, tripping);</td>
</tr>
<tr>
<td></td>
<td>Possibility of abuse;</td>
</tr>
<tr>
<td></td>
<td>Clotting disorder.</td>
</tr>
<tr>
<td>Nails</td>
<td>Frail, thin Nutritional deficiencies</td>
</tr>
<tr>
<td></td>
<td>Thick Onychomycosis (fungal infection).</td>
</tr>
</tbody>
</table>

*Accumulation in the blood of nitrogenous metabolites.

### Some Drugs/Foods interactions

<table>
<thead>
<tr>
<th>DRUG</th>
<th>FOOD/ Beverages</th>
<th>INTERACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticoagulants</td>
<td>Foods high in vitamin K*</td>
<td>May reduce the effectiveness of anticoagulants (such as warfarin), increasing the risk of clotting;</td>
</tr>
<tr>
<td></td>
<td>Avocado</td>
<td>Decreases drugs' effects;</td>
</tr>
<tr>
<td></td>
<td>Garlic</td>
<td>May increase risk of bleeding;</td>
</tr>
<tr>
<td>Antihistamines Codeine</td>
<td>Alcohol</td>
<td>Alcohol increases the sedative effects of these medications;</td>
</tr>
</tbody>
</table>

### ADVERSE REACTIONS OF SOME NUTRACEUTICALS

<table>
<thead>
<tr>
<th>Adverse reactions of some nutraceuticals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated charcoal</td>
<td>When taken in large doses, activated charcoal can cause</td>
</tr>
</tbody>
</table>
### Adverse reactions of some nutraceuticals

<table>
<thead>
<tr>
<th>Nutraceutical</th>
<th><strong>Symptoms</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alfalfa</strong></td>
<td>Hypoglycemia; Skin: photosensitivity; Other: lupus-like reaction;</td>
</tr>
<tr>
<td><strong>Aloe vera</strong></td>
<td>Gastro-intestinal: damage to intestinal mucosa, when used in high quantities, on a regular basis; Metabolic: fluid and electrolyte loss (with high doses); Skin: contact dermatitis, in hypersensitive individuals;</td>
</tr>
</tbody>
</table>

### Nutraceuticals-Drugs interactions

<table>
<thead>
<tr>
<th>NUTRACEUTICAL</th>
<th>DRUGS</th>
<th>INTERACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acidophilus</strong></td>
<td>Antibiotics</td>
<td>Antibiotics destroy the “friendly” gut flora;</td>
</tr>
<tr>
<td><strong>Activated charcoal</strong></td>
<td>Medication, generally</td>
<td>Activated charcoal can interfere with the absorption or metabolism of various nutrients and medications; take them away from each other;</td>
</tr>
<tr>
<td><strong>Alpha-lipoic acid</strong></td>
<td>Antidiabetic medication</td>
<td>May increase potency of anti-diabetic medication;</td>
</tr>
</tbody>
</table>

### The Ear and the sense of balance

- Exposure to loud noises may decrease the hearing acuity;
- Wax accumulation in the outer ear; blocks the pathway of sound waves to the hearing receptor (in the cochlea);
- Degeneration of cochlea structures; affects the hearing receptor’s function, and therefore, the hearing perception;
○ Various degrees of deterioration of the structures within the middle ear (the ossicles); may result in decreased sound waves transmission to the inner ear, which ultimately results in decreased hearing acuity;
○ Deterioration of the structures within the inner (internal ear); may result in balance problems, as the equilibrium receptors may be affected;
○ With age, people seem to lose the ability to hear high pitched sounds and also the ability to hear consonants well (this is why they always ask you: “Why are you mumbling?”; they simply can not hear the consonants in your phrases);

<table>
<thead>
<tr>
<th>Needed nutrients for the ear and the sense of balance</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>EFA’s</em>, as they are important in wax formation*;</td>
</tr>
<tr>
<td><em>Vitamin B complex</em>, important for energy pathways and nerve transmission;</td>
</tr>
<tr>
<td><em>Magnesium</em>, seems to be important in maintaining the sense of balance;</td>
</tr>
</tbody>
</table>

* Usually, presence of dark ear canal wax means EFA imbalance/deficiency

NOTE: hypoglycemia has been related to inner ear imbalances;

NUTRITIONAL ABNORMALITIES

*Under nutrition* happens when there are insufficient nutrients available for the body, either by deficient intake or by deficient absorption (malabsorption). We should also take into consideration the liver’s function (as the liver processes all classes of nutrients) which may have variable levels of impediment according to an elderly general state of health and also the drugs/medications that are taken.

In elderly, under nutrition is a sign of a general decline

*Causes* of under nutrition in the elderly population:
○ Decreased appetite;
○ Their sense of taste and smell is affected by drugs and/or smoking;
○ Mouth and teeth problems may be present, making chewing difficult;
○ They may be taking various appetite suppressant and/or nausea causing or taste/smell altering drugs;
○ They may live alone and are less motivated to prepare and eat their meals;
○ They may have movement disorders such as Parkinson, making preparation of food and going out to get food difficult;
○ Increased alcohol intake decreases the appetite and impairs absorption of nutrients;
○ Depression, anxiety and other psychiatric disorders.

**Signs and symptoms of under nutrition:**

○ Low body weight or losing weight without trying;
○ In time, temples may look hollow and bones may protrude;
○ Skin becomes weak, pale, and inelastic;
○ Muscle loss and muscle weakness;
○ Tiredness, sleepiness, dizziness;
○ Decreased resistance to infections.

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**ALZHEIMER’S DISEASE**

* degenerative brain disorder manifesting clinically as dementia, somehow characteristic EEG (electro-encephalogram) pattern (not yet proven) and distinctive brain tissue changes (definitive diagnosis is post mortem).
* more prevalent in females than males.

**Etiology theories:**

○ Genetic involvement (presence of a “weak gene” on chromosome 21);
○ Possible previous head trauma;
○ Environmental toxicity (aluminum and/or mercury exposure) and free radical damage;
○ Abnormal magnesium metabolism: magnesium competes with aluminum for absorption;
Nutritional deficiencies: EFA and/or nutrients that are responsible for producing neurotransmitters; also, low antioxidant status may contribute to the development of the disease;
Arteriosclerosis: linked to decreased blood flow to the brain tissue.

Clinical aspect

1. Early stage:
   - The decline starts and progresses gradually, beginning with short term memory loss;
   - Language problems, inability to perform normal, regular tasks, in the absence of motor impairment;
   - In time, confusion and disorientation appear; wandering away without knowing where they are and why they are there (cognitive impairment);
   - Personality changes: anger, paranoia, depression.

2. Intermediate stage:
   - Personality changes accentuate: more aggressiveness, agitation, hostility;
   - Loss of sense of time and space;
   - Still ambulatory (able to move on their own), but signs of physical impairment start showing up; increased risk for falls and accidents.

3. Late stage:
   - Physical deterioration present: inability to perform any activity necessary for their living; incontinence; inability to swallow and eat;
   - Neurological signs start showing up (localized motor and/or sensory impairment);
   - Complete memory loss; complete dependence on others;
   - Coma and death, usually from infections.

Diagnosis:
- Clinical aspect; please, keep in mind that, at least in the first stages, Alzheimer’s very much resembles Dementia, and a differential diagnosis between the above mentioned two is difficult;
- Usually, the diagnosis is by exclusion: all other causes of dementia (substance abuse, medications, toxic exposure, tumors, trauma, metabolic conditions, infections, vascular causes) are to be investigated by medical history, physical examination and laboratory testing;
- EEG seems to be somehow characteristic in Alzheimer;
- Abnormal fingerprints pattern;
○ Post mortem: brain tissue modifications, like neurofibrillary tangles and senile plaques (agglomerations of devitalized tissue and proteins); also loss of neurons.

Natural medicine treatment approach:

○ Sustained body support: mild liver detoxification See under Detoxification and elimination in Part I; identification of possible allergies and/or nutritional abnormalities followed by correction; ○ Digestive system and immune system status assessment; appropriate measures, if necessary; ○ Avoid toxic and environmental additional exposure; ○ Begin antioxidant rich diet (foods rich in vitamins A, C, E; selenium; zinc; see appendices G and H); ○ Increase intake of sulfur containing foods for detoxification purposes (see appendix H); ○ Lecithin, as a building block for neurotransmitters (found in egg yolks, soy, cauliflower, cabbage, fish).

Supplements:
○ Vitamin B complex, 50-100 mg/day; ○ Vitamin B12, 1000 mcg once or twice a day, as it is vital (along with folic acid) for the functioning of the nerves; ○ Thiamin (vitamin B1) seems to have a good effect in improving acetylcholine function; ○ Vitamin C, 2-3 g/day associated with a good antioxidant complex; ○ Zinc, 30-45 mg/day; ○ Flax seed oil, one to two tablespoons/day.

Others:
○ Gingko biloba, as it increases circulation to the brain (take under supervision, as it may increase the risk of hemorrhagic stroke); ○ Ginseng powder, added to herbal teas, as it improves memory; ○ Rosemary is a nervous tonic, especially for the elderly population; ○ Geranium essential oil regulates the nervous system.

Long-Term Care-types:
Assisted living communities: Living amenities; meals; recreational facilities and programs; health care; visiting nurses and other health care professionals; For people who can take care of themselves, generally, but need some help with ADL; some residents may need care for their physical/psychological needs;

Retirement communities: Normal lifestyle, except the necessity of caring for your own home; No meals provided, unless ordered; No medical care provided, unless ordered; For people who can take care of themselves, but need help with household and/or yard activities;

APPENDIX A: FOODS-AT-A-GLANCE

<table>
<thead>
<tr>
<th>FOOD</th>
<th>NUTRITIONAL VALUE</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almonds</td>
<td>Potassium, phosphorus, magnesium, fiber, EFA's, antioxidant flavonoids;</td>
<td>Muscle, brain and nerves food; cardio-vascular protection and anti-cancer properties;</td>
</tr>
<tr>
<td>Amaranth</td>
<td>Magnesium, fiber, proteins, tocotrienols (vitamin E fraction), phytosterols;</td>
<td>Cardio-vascular protection and cholesterol-lowering properties; prevention of chronic degenerative diseases (due to phytosterols content); beneficial for cases with Type II Diabetes;</td>
</tr>
<tr>
<td>Apples</td>
<td>Potassium, phosphorus, magnesium, soluble and insoluble fiber, ellagic acid and bioflavonoids, quercetin, pectin;</td>
<td>Gastro-intestinal and urinary system health; cholesterol-lowering properties (due to pectin content); asthma approach (due to quercetin content);</td>
</tr>
</tbody>
</table>
## APPENDIX C: FOOD SOURCES OF MINERALS

<table>
<thead>
<tr>
<th>MINERALS</th>
<th>Food sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boron</strong></td>
<td>V Dandelion greens, potatoes, spinach; F apples, apricots, figs;</td>
</tr>
<tr>
<td><strong>Calcium</strong></td>
<td>M Dairy, salmon, sardines, almonds, filberts, sesame seeds; G oats; V green leafy vegetables, asparagus, broccoli, cabbage, collards, dandelion greens, kale, mustard greens, soybeans, tofu, turnip greens, okra, watercress; F figs, prunes, papaya; O whey, blackstrap molasses, carob;</td>
</tr>
<tr>
<td><strong>Chromium</strong></td>
<td>M Eggs, cheese, corn oil; G brown rice, whole grains; V dried beans, asparagus, beets, mushrooms, potatoes; F apples, grapes, prunes; O Brewer’s yeast, blackstrap molasses;</td>
</tr>
</tbody>
</table>

Legend:

M - meats, eggs, dairy, nuts, oils; F - Fruits; G - grains; V - Vegetables, legumes; O - Others;

ACE: Angiotensin Converting Enzyme;  
Achetylcholine: neurotransmitter;  
Acute: severe symptoms and a short course;  
Adaptogen: an agent that helps the body in accommodating stress, both physical and mental;  
Adenine: nucleic acid base;  
ADR: adverse drug reaction;  
Adrenaline: see Epinephrine;  
Alkamides: metabolites widely distributed in plants with a broad range of biological activities;  
Allergen: substance that triggers an allergic reaction;
**Allergology** - study of allergies;

**Allergic terrain** - tendency to developing sensitivities;

**Allergy** - an acquired, abnormal, exaggerated immune response;

**Alpha-gliadin** - protein of wheat and other grains, which causes gluten sensitivity;

**Alterative** - agent capable of favourably altering unhealthy conditions of the body and tending to restore normal function;

**Analgesic/anodyne** - substance that relieves or diminishes pain without loss of consciousness;

**Anaphylaxis** (anaphylactic shock): sudden, severe, potentially life-threatening allergic reaction;

**Anethol** - oil with anti cancer and anti-inflammatory properties in fennel;

**Anthraquinones** - substances with irritant laxative effect;

**Antiarrhythmic** - agents that can regulate cardiac rhythm;

**Antibiotic/antibacterial** - a substance that has the capacity to inhibit or kill microorganisms selectively;

**Antibody (immunoglobulin)** - a protein that is manufactured by lymphocytes to neutralize or destroy an antigen or foreign protein;

**Antiemetic** - substance that reduces the incidence and severity of nausea and vomiting;

**Antigen** - a substance that can trigger an immune response causing the production of antibodies;

**Antihelmintic/vermifuge** - a substance that destroys or expels intestinal worms;

**Anti-inflammatory** - counteracts or diminishes inflammation or its effects;

**Antihistamine drugs** - a group of drugs that block the effects of histamine;

**Anti-inflammatory drugs** - drugs that reduce the symptoms and signs of inflammation;

**Antimicrobial** - a substance that acts against microorganisms, generally

**Antioxidant** - a compound which prevents free radical or oxidative damage;

**Antipyretic** - an agent that can reduce fevers;

**Antisclerotic** - an agent that helps prevents the hardening of tissues;
Antiseptic: an agent that destroys and prevents the development of microbes;

Antispasmodic: an agent that relieves spasms or cramps;

Antitussive: an agent that can diminish cough;

Antiviral: a substance that acts against viruses selectively

Anxiolytic: an agent that can reduce anxiety;

Aperient: a mild laxative;

Arrhythmia: abnormal heart rhythm;

Arteriosclerosis: hardening of arteries;

Arthritis: inflammation of the articular structures;

Asparagine: substance in asparagus, responsible for urinary strong odour;

Asthma, extrinsic: asthma that is triggered by an allergic reaction, usually to something that is inhaled;

Astringent: an agent which causes contraction of tissues;

Asymptomatic: no symptoms;

Asystole: no cardiac contraction;

Atherosclerosis: hardening of arteries by plaques formation;