

Anti-Inflammatory Diet

Vijay Jain M.D., F.A.C.S

Integrative Medicine

What is Inflammation?

A localized protective response elicited by injury or destruction of tissues, which serves to destroy, dilute, or wall off both the injurious agent and the injured tissue.

Inflammatory Response

Can be provoked by :

Physical, chemical or biological agents and certain foods

Trauma

Exposure to excessive sunlight

Exposure to radioactive materials, corrosive chemicals

Infectious agents like bacteria, viruses and other pathogenic microorganisms.

And is not synonymous with infection

Additional cause of Inflammation according to Ayurveda

There are many causes that contribute to an excessive amount of pitta in the body including:

- ▶ Eating a pitta-provoking diet (Sour, hot pungent, fried and heavy foods specially meats with saturated fats). That is the standard American Diet.
- ▶ Exposure to chemicals
- ▶ Too much sun exposure, sunburn
- ▶ Emotional stress
- ▶ Epigenetics vs genetics

Changes that occur with acute inflammation

- ▶ Hemodynamic changes like increased permeability and inflammatory edema
- ▶ Leukocyte exudation like neutrophils and macrophages
- ▶ Chemical mediators like vasoactive amines (e.g., histamine and serotonin), endopeptidases (kinin system that interacts with antigen-antibody complexes) and prostaglandins.
- ▶ Hormonal response of which cortisol is anti-inflammatory while others are pro-inflammatory.

Chronic inflammation

Prolonged and persistent inflammation marked chiefly by new connective tissue formation; it maybe a continuation of an acute form or a prolonged low-grade form.

Diseases associated with Chronic inflammation as the root cause

- ▶ Auto-immune diseases like Rheumatoid arthritis, lupus, inflammatory bowel diseases like Crohn's and Ulcerative colitis, Psoriasis, certain neurological diseases.
- ▶ Cancer
- ▶ Alzheimer's
- ▶ Atherosclerosis and Vascular disease
- ▶ Diabetes Mellitus
- ▶ Allergies

Rationale for Anti-inflammatory Diet

- ▶ Counteracts the Chronic inflammation that is the root cause of many serious diseases
- ▶ Gives a healthy balance of Omega-3 and Omega-6 fatty acids. Too much Omega-6 especially in Standard American Diet synthesize hormones that produce inflammation. Oil extracted from oil-rich seeds used in all snack foods and fast foods contain too much Omega-6 fatty acids.

Rationale Continued

- ▶ Reduce advanced glycation end products (AGEs) which are chemical reaction between certain sugars and proteins.
- ▶ Reduce pro-inflammatory fats contained in meats and poultry.
- ▶ Reduce angiogenesis specially in cancer patients linked to chronic inflammation
- ▶ Reduce serum levels of insulin and free IGF-1 which are associated with chronic inflammation.

Bio-Chemical Markers of Chronic Inflammation

- ▶ C-Reactive protein
- ▶ Interleukin-6
- ▶ Homocysteine
- ▶ Soluble i-CAM (intercellular adhesion molecule)
- ▶ Tissue Necrotic Factor- Alpha
- ▶ Erythrocyte Sedimentation Rate
- ▶ IGA- angiogenic factor
- ▶ Low density Lipids (LDL)
- ▶ Free IGF-1 and serum Insulin levels

Foods that cause Chronic Inflammation (as evidenced by Biochemical markers)

- ▶ Processed meats and poultry
- ▶ Hydrogenated fats like margarine
- ▶ Fried Potatoes, Salty snacks and fast foods containing oils from oil-rich seeds
- ▶ High glycemic foods like breads, white potatoes, crackers, chips, snack foods, pastries, sweetened drinks, foods processed with high fructose syrup.
- ▶ Fruits like bananas, mango and papaya in excess
- ▶ Sweeteners like white sugar
- ▶ Frozen foods, ice cream, milk shakes (Kapha increasing foods)

Anti-inflammatory Foods

- ▶ Whole Grains : Brown rice, Basmati rice, Wild rice, Black rice, Buckwheat, Groats, Barley, quinoa, steel-cut oats, Farrow, Millet (Ragi). **Rationale** - Low glycemic foods digest slowly and raise blood sugar slowly. No whole wheat bread or other products made from flour.
- ▶ Pasta made from rice and millet, rice noodles, bean thread noodles, buckwheat noodles like Udon and Soba. **Rationale** - Low glycemic foods.
- ▶ Beans and Legumes : Beans like Adzuki, Black beans, Anasazi, Chickpeas, Black-eyed peas and Soya beans (other Soy Bean products). Lentils like yellow mung, split- green mung, whole mung, red lentils, brown lentils. **Rationale**- low glycemic foods

Anti-inflammatory Foods Continued

- ▶ Vegetables : Lightly Cooked dark leafy greens like spinach, collard greens, kale, arugula, Swiss chard, and mustard greens. Cruciferous vegetables like broccoli, cabbage, Brussels sprouts, Bok choy, and cauliflower. Carrots, beets, onions, peas, squashes, sea vegetables and washed salad greens. Mushrooms like Shitake, enokidake, maitake, Oyster mushrooms are immune modulators. Minimize portabella and button mushrooms. Egg plant, gourd, Bitter gourd. **Rationale**- Rich in flavonoids and carotenoids with both anti-oxidant and anti-inflammatory activity. Multi-colored, organic and fresh or frozen.

Anti-inflammatory Foods Continued

- ▶ Fruits : Raspberries, Blue berries, strawberries, cherries, peaches, nectarines, oranges (not juice), pink grapefruit, plums, pomegranates, blackberries, apples, avocado and pears. **Rationale**- Rich in flavonoids and carotenoids with both anti-oxidant and anti-inflammatory activity. Multi-cored, fresh, organic.
- ▶ Nuts and seeds: Walnuts, Flax seeds, pumpkin seeds, Hemp seeds, Chia seeds. **Rationale**- Rich in Omega-3 fatty acids.

Anti-inflammatory Foods Continued

- ▶ Oils : Extra Virgin Olive oils for dressings and toppings, Avocado, Sesame, Coconut, Walnut and Hazelnut oils for stir-fries. Ghee in moderation can be used for stir-fries.
Rationale- Rich in monosaturated or omega-3 fats. The findings suggest that *ghrita* prepared by traditional ayurvedic methods contains higher amount of DHA; Omega-3 long-chain polyunsaturated fatty acids, which is a major component of retinal and brain tissues and remains important in prevention of various diseases.

Anti-inflammatory Foods Continued

- ▶ Meats and Sea-foods and Poultry: Reduce or eliminate consumption of meats and poultry. Meat from dry climates may be alright(Ayurveda- Muduga).High quality proteins are pro-inflammatory. Wild Alaskan Sockeye Salmon is rich in Omega-3 fatty acids which are anti-inflammatory.
- ▶ Spices : Turmeric, Ginger, Ajwain (*Trachyspermum ammi*), Fenugreek, Coriander, Basil, Rock salt in moderation, chillies, Cinnamon, Rosemary and thyme, and garlic in moderation. **Rationale**- Strong anti-inflammatory.

Anti-inflammatory Foods Continued

- ▶ Moringa Leaf in cooking. Strong anti-inflammatory.
- ▶ Honey (Local) can be anti-inflammatory
- ▶ Tea : White or green teas rich in Catechins that reduce inflammation. 91-2 cups a day)
- ▶ Chocolate : Dark Chocolate (> than 70% Coco) is high in Polyphenols that have anti-oxidant activity (1 piece a day)
- ▶ Wine : Red wine has anti-oxidant property. 8 oz. glass/day

Anti-inflammatory Foods Continued

▶ Supplements :

1. Spirulina : Anti-inflammatory.
2. Moringa leaf powder : strong anti- inflammatory
3. Ginger and coriander infused water
4. Ginger, rock salt and lemon tea
5. Fenugreek, Dandelion, milk thistle teas
6. Fenugreek and Bilva in a jam preparation
7. Selenium 200 mcg of organic yeast form, Co-enzyme Q10 (60mg/day),
Fish oil, Vitamin D3 2000 IU, Mixed carotenoids 10,000 IU, Vitamin E 400 IU

Additional Ayurvedic Recommendations

- ▶ Maintenance of all Agnis
- ▶ Jaggery, pippali, ginger and boiled whole milk (Panchkol preparation)
- ▶ Ginger Coriander infused water
- ▶ Fenugreek and Bilva in a jam preparation
- ▶ Barley flour Roti in Dashmoola water. Barley is dry, reduces swelling, protects agni and is anti-inflammatory. Also Millet Roti in Dashmoola water.
- ▶ Swarjika Kshara ½ tsf. Twice a day in warm water

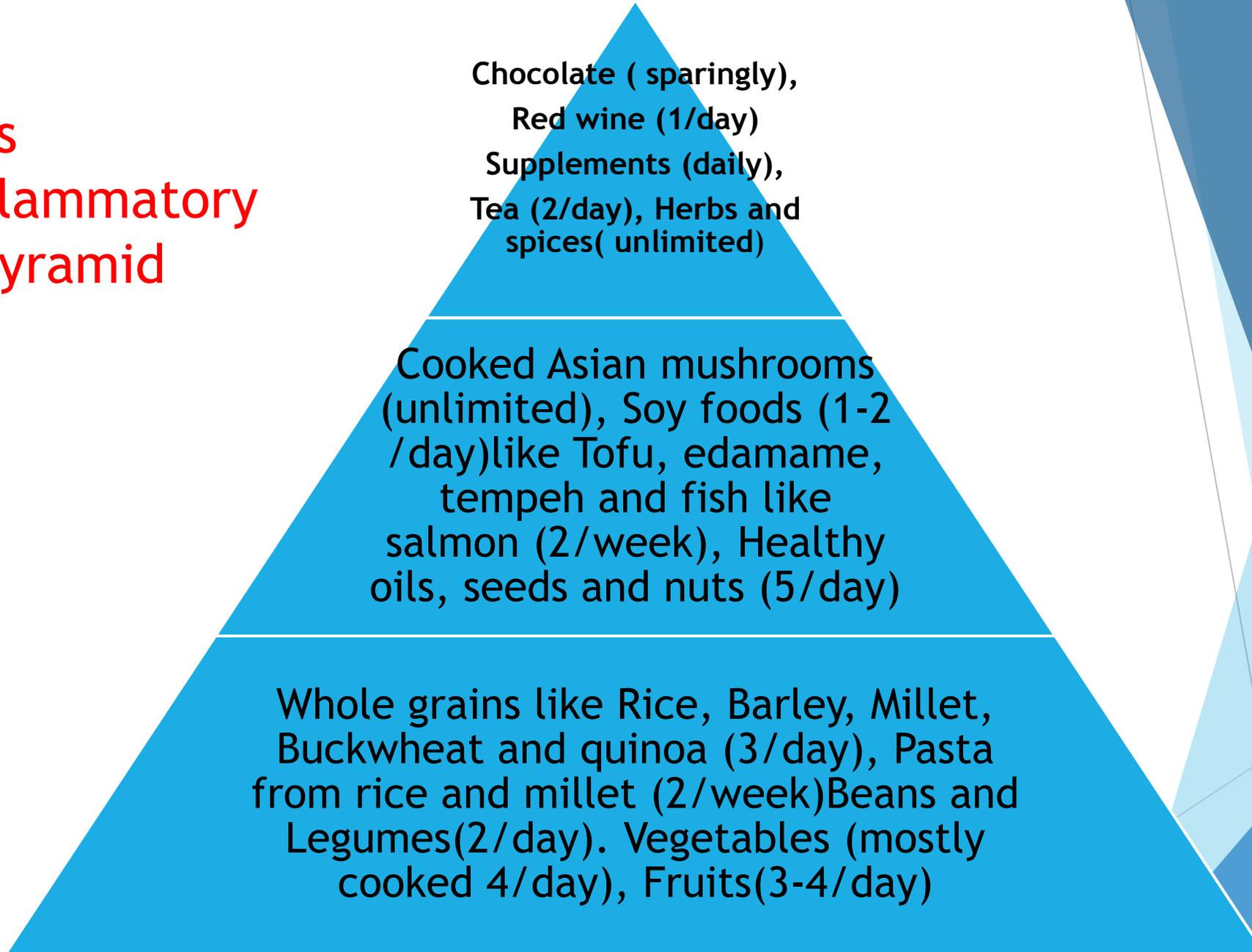
Additional Ayurvedic Recommendations continued

- ▶ Boswelia as a supplement 500 mg. twice a day - strong anti-inflammatory
- ▶ Punarnava and Gokshura Combination - anti-inflammatory
- ▶ Dashmoola (combination of 10 roots) is anti-inflammatory
- ▶ Panchakarma - Detoxification program on a periodic basis. Very powerful anti-oxidant and anti-inflammatory results.
- ▶ Stress Reduction techniques like Meditation and Yoga

Special Diets

- ▶ Pritikin Diet : Semiquasi Vegan diet. Low fat, moderate protein derived from Vegetable proteins, high in low glycemic index carbohydrates. Aerobic Exercise.
- ▶ Dean Ornish's Diet : More strict vegan. Stress reduction program. Both show lower levels of serum insulin and free IGF-1.
- ▶ Andrew Weil's Diet : Very popular. Moderation plan. Includes seafood that are rich in EFA and Omega-3 like salmon, sardines, herring and black cod.

Dr. Jain's Anti-inflammatory Foods Pyramid



Numbers mean serving/day