Quenching the Fire: Natural Treatments for Inflammation

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What Is Inflammation and Why Do We Care?
Inflammation as Foundation for Disease
Quenching Inflammation
Role for Integrative Medicine in Cancer
Q & A
THE SECRET KILLER

The surprising link between INFLAMMATION and HEART ATTACKS, CANCER, ALZHEIMER’S and other diseases

What you can do to fight it.
What Is Inflammation?

* Complex biological process that is necessary for defense, repair, and healing
* Essential for survival
* Caused by external things like foreign objects, pathogens, and trauma.
* Also caused by internal things like hormone/biochemical imbalance, degenerative processes, auto-immunity, and stress.
What is Inflammation?

- Four Characteristics
  - Dolor (Pain)
  - Calor (Heat)
  - Rubor (Redness)
  - Tumor (Swelling)

Celsus
What is Inflammation?

*Functio laesa (loss of function)*

Galen
What is Inflammation?

Steps of the Inflammatory Response

1. Damaged tissues release histamines, increasing blood flow to the area.
2. Histamines cause capillaries to leak, releasing phagocytes and clotting factors into the wound.
3. Phagocytes engulf bacteria, dead cells, and cellular debris.
4. Platelets move out of the capillary to seal the wounded area.

The inflammatory response is a body's second line of defense against invasion by pathogens. Why is it important that clotting factors from the circulatory system have access to the injured area?
Why Do We Care?

Inflammation

- Pulmonary diseases
- Neurological diseases
- Autoimmune diseases
- Arthritis
- Cancer
- Cardiovascular diseases
- Alzheimer
- Diabetes II
Inflammatory Diseases

- Acne vulgaris
- Allergies
- Asthma
- Atherosclerosis/CVD
- Autoimmune diseases
- Celiac disease
- Chronic prostatitis
- Diabetes
- Glomerulonephritis
- Hypersensitivities
- Inflammatory bowel diseases
- Myopathies
- Pelvic inflammatory disease
- Rheumatoid arthritis
- Sarcoidosis
- Transplant rejection
- Vasculitis
- Interstitial cystitis
Coronary heart disease (CHD) is the leading cause of death of women in the US

1 in 4 women die every year from CHD

64% of women who die suddenly from CHD had NO symptoms

Inflammation underlies much of the pathogenesis of disease
Inflammatory Diseases: Heart

- CHD includes high blood pressure and atherosclerosis, increasing risk of MI and stroke.
- Atherosclerosis involves an ongoing inflammatory response.
- Elevation in markers of inflammation predicts outcomes of patients with acute coronary syndromes, independently of myocardial damage.
- Low-grade chronic inflammation, as indicated by levels of C-reactive protein, can define risk of AS complications.
Inflammatory Diseases: Heart
Markers of inflammation useful in predicting stability of plaques
Measurement of cholesterol and subtypes predictive of MI risk
Cholesterol and arterial inflammation directly affected by changes in lifestyle and diet!
Inflammatory Diseases: Joint

- Arthritides: rheumatoid, osteo, psoriatic, gout
- More than 100 forms
- Arthritis is leading cause of disability in the US
- 22% of adults have doctor-diagnosed arthritis
- Contributes to inactivity
- Prevalence of obesity 54% higher in adults with arthritis
Inflammatory Diseases: Joint

Chronic Inflammation Destroys Tissues

- White blood cell
- Cytokines attract more white blood cells
- Enzymes digest collagen
- Tissue destroyed
Many inflammatory joint diseases have auto-immune component (RA, PA, SLE)

Severity of inflammation can be monitored using blood markers such as sed rate, CRP

Duration of inflammation causes joint destruction and deformity
Inflammatory Disease: Joint

- Dramatic changes can be affected with dietary and lifestyle changes
- Exercise benefits joint mobility
- Food sensitivities often play a role in joint inflammation
Inflammatory Diseases: Diabetes

- Diabetes affects 25.8 million Americans
- 8.3% of US population
- 18.8 million diagnosed, 7.0 million undiagnosed
- 35% of Americans age 20+ with “pre-diabetes” based on HgA1c or fasting glucose
- Leading cause of kidney failure, non-traumatic limb amputation, and blindness
- Major cause of heart disease and stroke
Inflammatory Diseases: Diabetes

Rate of new cases of type 1 and type 2 diabetes among youth ages younger than 20 years, by race/ethnicity, 2002–2005

Rate (per 100,000 per year)

<10 years

10–19 years
Inflammatory Diseases: Diabetes

- Type II DM results from impaired beta cell function combined with insulin resistance acting on susceptible genes
- Generally increased body weight
- Chronic low-grade tissue inflammation related to obesity
- However, inflammation without obesity appears to also be a culprit
Inflammation and Cancer

- Inflammation underlies cancer development, promotion, and angiogenesis
- Inflammation orchestrates the microenvironment around tumors, contributing to proliferation, survival and migration.
- Cancer cells use selectins and chemokines and their receptors for invasion, migration and metastasis.
Systemic low-grade inflammation creates inflammatory cytokines IL-6, CRP, TNF-a, fibrinogen.

IL-6 and CRP adversely affect cancer.

High insulin, depression upregulate IL-6 and CRP too!
Inflammation and Cancer

* Elevated cortisol from stress increases insulin and creates abdominal (visceral) fat
* Dysregulation of insulin and visceral fat promote tumor cell proliferation and inflammatory cytokines
* High cortisol and insulin ➔ obesity, inflammation ➔ poor outcomes for cancer survival
What is Inflammation?
Inflammatory Biochemicals

* Acute phase proteins: hsCRP, sed rate, serum amyloid A and P
* Systemic inflammatory interleukins: IL-6, IL-8, IL-18
* TNFa, nfKB, fibrinogen
* Markers of Diabetes: insulin, glucose, leptin, hemoglobin A1c
How Do We Stop Inflammation?
Stopping Inflammation

* Anti-inflammatory diet
* Exercise & Lifestyle changes
* Anti-inflammatory supplements
* Medications
Stopping Inflammation: Diet

- Balanced, whole foods diet
- Mediterranean/low glycemic index foods
- Greens drinks
- Green tea
- Limit alcohol
- Improve digestion and elimination
- Identify food sensitivities
- Balance hormones, neurotransmitters, blood sugar

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Anti-Inflammatory Food Pyramid

Andrew Weil, MD, created an Anti-Inflammatory Food Pyramid to help people make optimal food choices every day.

- **HEALTHY SWEETS** (such as plain dark chocolate) Sparingly
- **RED WINE** (optional) No more than 1-2 glasses a day
- **SUPPLEMENTS** Daily
- **TEA** (white, green, oolong) 2-4 cups a day
- **HEALTHY HERBS & SPICES** (such as garlic, ginger, turmeric, cinnamon) Unlimited amounts
- **OTHER SOURCES OF PROTEIN** (high quality natural cheeses and yogurt, omega-3 enriched eggs, skinless poultry, lean meats) 1-2 a week
- **COOKED ASIAN MUSHROOMS** Unlimited amounts
- **WHOLE SOY FOODS** (edamame, soy nuts, soymilk, tofu, tempeh) 1-2 a day
- **FISH & SEAFOOD** (wild Alaskan salmon, Alaskan black cod, sardines) 2-6 a week
- **HEALTHY FATS** (extra virgin olive oil, expeller-pressed canola oil, nuts - especially walnuts, avocados, seeds - including hemp seeds and freshly ground flaxseeds) 5-7 a day
- **WHOLE & CRACKED GRAINS** 3-5 a day
- **PASTA** (al dente) 2-3 a week
- **BEANS & LEGUMES** 1-2 a day
- **VEGETABLES** (both raw and cooked, from all parts of the color spectrum, organic when possible) 4-5 a day minimum
- **FRUITS** (fresh in season or frozen, organic when possible) 3-4 a day
Exercise & Lifestyle Changes

*Come to my break out session at 2:15!!*
Many natural compounds work at the same biochemical locations as conventional pharmaceuticals.

Supplements generally have fewer side effects than drugs.

Natural compounds can have synergistic and complementary effects that go beyond primary target.
Supplements DO NOT replace the benefits of a healthy diet and lifestyle!!!
Stopping Inflammation: Supplements

* Curcumin
* Fish oil
* Vitamin D
* Boswellia
* SAMe
* Ginger
* Antioxidants and Bioflavonoids
Curcumin

- *Curcuma longa*; spice from ginger family used in Eastern cuisines
- Curcuminoids

![Curcumin structure](image)
Curcumin
Curcumin

* Anti-tumor: anti-inflammatory, pro-apoptotic, inhibits tumor cell proliferation, anti-angiogenic

* Inhibits NFkB, EGFR activation, TK activity of HER2/neu receptor, chemokines (IL-8)
Curcumin

* Regulates NFkB gene products, COX-2, cyclin D1, adhesion molecules, MMPs, inducible nitric oxide synthetase, Bcl-2, Bcl-Xₐ, and TNF.

* Radiosensitization of cancer cells and radioprotection of normal cells
Curcumin administration increased body weight, decreased serum TNF-alpha levels, increased apoptotic tumor cells, enhanced expression of p53 molecule in tumor tissue, and modulated tumor cell apoptotic pathway in patients with colorectal cancer.


Combined isoflavones and curcumin lowered PSA levels and suppressed androgen receptors in patients with prostate cancer.

Ide H. Prostate. 2010 Jul 1;70(10):1127-33.
* Bioavailability of pure curcumin is poor
* When combined with a fat and bioperine, it’s better absorbed
Vitamin D

* Fat soluble vitamin that plays a role in:
  * Calcium metabolism
  * Bone and cartilage strength
  * Tooth and gum health
  * Insulin production
  * Lipid metabolism
  * Immune system function
  * Cancer development
Vitamin D

* Made in the skin from sun (UVB) exposure
* Synthesized in the liver, kidney
* Active form is D₃, cholecalciferol
* Acts more like a steroid hormone than vitamin
* Partners with vitamin K in calcium regulation
* Vitamin A competes with absorption of D
* Calcium intake must be adequate
Vitamin D Deficiency

* Linked to the exacerbation of many conditions:
  * Osteoporosis, osteomalacia, osteoarthritis
  * Muscle weakness and pain
  * Periodontal disease
  * Hyperparathyroidism
  * Inflammation
  * Cancer
  * Autoimmune diseases: MS, Diabetes, RA, IBS, SLE, thyroiditis
Vitamin D Deficiency

- Lack of sun exposure
- Latitudes above 40°
- Fat-binding drugs like statins
- Fat malabsorption, problems with bile or digestive enzymes
- Dark skin or dark tan
- Obesity
- Hormone imbalances
- Aging
Vitamin D

* Non-sun sources include:
  * Cod liver oil
  * Oily fish like mackerel, salmon, sardines
  * Fortified orange juice, milk, cereals, and breads
  * Supplements
Essential Fatty Acids

- Polyunsaturated (good) fats: Omega 3 and Omega 6 fatty acids
- “Essential” because body does not manufacture them
- Alter inflammation severity by manipulating dietary fats
- Cell flexibility, nerve communications, mood enhancement, brain function
Essential Fatty Acid Metabolism

Linoleic Acid (Omega-6)
- GLA
- Arachadonic Acid
- Blocks Inflammation

Linolenic Acid (Omega-3)
- EPA
- DHA
- Blocks Inflammation
Sources of EFAs

* Most beneficial EFAs are EPA and DHA (Omega 3) from cold water fish like salmon, sardines, mackerel, and herring
* GLA (Omega 6) can be found in evening primrose oil and borage oil
* Animal-rich diets are high in Omega 6
* Vegetable, fish, and whole grain-based diets are high in Omega 3
Concerns with EFAs

- Source of fish oil may contain heavy metals
- Farmed salmon is not high in Omega 3
- Factors that reduce absorption of EFAs:
  - Low levels of key vitamins and minerals
  - Alcohol consumption
  - Some prescription drugs
  - A diet high in hydrogenated and trans fats
  - Age
  - Compromised immune status
Antioxidants

- Vitamin C, E, Selenium, Zinc, carotenoids, alpha-lipoic acid, bioflavonoids, quercetin, green tea, milk thistle, gingko, CoQ10
- Anti-inflammatory
- Enhance immune function
- Scavenge free radicals
- Anti-viral, anti-bacterial
- Vessel integrity
- Vision enhancement
Bioflavonoids

- Found in fruits and vegetables
- Antioxidant, anti-inflammatory, connective tissue support, reduces platelet aggregation
- Oligomeric proanthocyanidins (OPCs) and reservatrol exert anti-inflammatory action by inhibiting NF-kappaB, TNF-alpha, phospholipase A2, and cytokines
S-adenosylmethionine occurs naturally in body from methionine and B12 and FA

- Synthesis of neurotransmitters, melatonin, phospholipids, and cellular growth factors
- Reduces TNF-alpha, fibromyalgia pain, joint damage
- Increases joint regeneration in osteo and rheumatoid arthritis
- Showed similar effectiveness as Celebrex for OA relief
Boswellia serrata

- Ayurvedic anti-inflammatory
- Resin extracts (boswellic acids) have been found to inhibit inflammation and reduce cartilage destruction
- Improvement of respiratory symptoms, lung function, and bloodwork in asthma
- Long term use has not been shown to cause GI irritation or ulceration like NSAIDS
Ginger

- Inhibits inflammation (COX-1 and LOX) and platelet aggregation
- Significant decrease in knee pain with movement in OA
- Similar effect of ginger in OA pain as ibuprofen
- Caution with blood thinning agents
Research: Heart

- The Mediterranean diet pattern and its main components are associated with lower plasma concentrations of tumor necrosis factor receptor 60 in patients at high risk for cardiovascular disease.
- Effects of coenzyme Q10 supplementation on inflammatory markers (high-sensitivity C-reactive protein, interleukin-6, and homocysteine) in patients with coronary artery disease.
- The effect of a one-year lifestyle intervention program on carotid intima media thickness.
- Changes in emerging cardiac biomarkers after an intensive lifestyle intervention.
A vegan diet free of gluten improves the signs and symptoms of rheumatoid arthritis: the effects on arthritis correlate with a reduction in antibodies to food antigens.


Anti-inflammatory effects of a low arachidonic acid diet and fish oil in patients with rheumatoid arthritis.

Exercise with calorie restriction improves insulin sensitivity and glycogen synthase activity in obese postmenopausal women with impaired glucose tolerance.

Effect of endurance exercise training and curcumin intake on central arterial hemodynamics in postmenopausal women: pilot study.

Media

* **Books:**
  * *The Inflammation Syndrome* by Jack Challem
  * *Inflammation Nation* by Floyd H. Chilton
  * *The Inflammation Free Diet Plan* by Monica Reinagel

* **Movies:**
  * *Forks over Knives*
  * *Fat, Sick, and Nearly Dead*
Integrative Medicine for Cancer

- Science-based holistic approach treats body, mind, spirit
- Use of body’s innate healing power
- Use of natural substances to promote healing
- Herbs, nutrition, supplements, physical therapies, natural drugs, counseling, homeopathy and biofeedback
- Pharmaceutical drugs if needed
- Complementary to and supportive of conventional treatment for cancer

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Summary

* Inflammation as a unifying theory of disease
* Heart disease, joint disease, diabetes, and cancer
* Dietary choices and lifestyle measures can diminish inflammation and control disease
Q & A

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www.redcedarwellness.com