AN ANTI-INFLAMMATORY DIET: What Is It and What Is Its Value In Vascular Disease?

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Disclosures
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ATHEROSCLEROSIS
• The central process in PAD
• Diet, exercise, smoking cessation
• Guideline directed statin therapy – aimed at lowering LDL C
• Not solely cholesterol deposition – inflammation plays a key role
  • Leukocytes pro-inflammatory cytokines (1)
    • Endothelial adhesion, cellular migration
    • Initiate plaque formation
  • Activated macrophages and T-lymphocytes colocalize in plaque and continue inflammatory response (2)
  • Activated leukocytes drive plaque maturation and macrophages and T-lymphocytes associated with plaque rupture (3,4)

INFLAMMATION
• hsCRP
  • Elevated with CV risk factors
    • HTN
    • T2D
    • Obesity
  • Independently associated with CV risk
• Statins lower hsCRP – lower CV risk
• Independent LDL C reduction – lower CV risk
• Reductions in hsCRP not seen with monoclonal ab Rx for LDL C
• JUPITER shows benefit in hsCRP reduction in primary prevention
  • Not clear this is independent of LDL C reduction
• CANTOS – Canakinumab lowers hsCRP dose dependently with no LDL C effect
  • 15% reduction in MACE in higher dose groups

Cholesterol + Inflammation = CVD
• Methods to reduce Inflammation
  • Smoking cessation
  • Regular exercise
  • Weight loss
  • Adequate sleep
• Diet
  • Mediterranean
  • Vegetarian
  • Low carbohydrate

ANTI-INFLAMMATORY DIET
• Increased fruits and vegetables
• Minimal trans and saturated fats
• Limited refined or processed carbohydrates
• Increased whole grains
• Lean protein sources
  • Vegetable protein source
  • Chicken
• Avoid refined sugars
• Spices that are anti-inflammatory
  • Ginger, curry, turmeric, cinnamon, others.
ANTI-INFLAMMATORY DIET

- Eliminate soda and beverages with sugar added
- Dark leafy green vegetables
- Blueberries, blackberries, and cherries
- Broccoli and cauliflower
- Avocado and coconut
- Olives
- Extra virgin olive oil
- Walnuts, pistachios, pine nuts, almonds
- Fish high in omega-3 fatty acids
  - Salmon, tuna, sardines

WHAT TO AVOID

- Fried foods – no matter what they are fried in – vegetable oils increase inflammation
- Creamers, margarine – trans fats increase inflammation
- Rice, pasta, white bread – processed carbohydrates increase inflammation
- Processed meats
  - Hot dogs
  - Sausage
  - Processed sandwich meats

BENEFITS OF ANTI-INFLAMMATORY DIET

- Reduced cardiovascular morbidity and mortality
- Reduced inflammatory conditions
  - Lupus
  - RA
  - Inflammatory bowel disease
  - Psoriasis
  - Crohn's disease
  - Asthma
  - Diabetes
  - Obesity
  - Hashimoto's disease

Diet and Arterial Stiffness

- 470 individuals
- Food record and tonometry to assess arterial elasticity
  - > carbohydrates vs fats
    - Increased aortic pulse pressure and mean arterial pressure
  - > carbohydrates vs protein
    - Increased aortic pulse pressure and mean arterial pressure
  - Replacing alcohol with protein
    - Reduces aortic and mean pressures
  - Diet macronutrient distribution affects cardiovascular health

A New Dietary Inflammatory Index Predicts Interval Changes in Serum High-Sensitivity C-Reactive Protein

Assess effects of foods on 6 biomarkers of inflammation based upon literature review
Grade food components based upon scientific research related to these biomarkers
Can grade diets based upon components in the index

Authors assessed relationship of the DII to hsCRP in sampled populations
Elevated DII relates to decreased hsCRP
Elevated DII relates to decreased colon cancer risk
**ORIGINAL RESEARCH**

Association of dietary inflammatory index with metabolic profile in metabolically healthy and unhealthy obese people

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**DIETARY INFLAMMATORY INDEX**

- 300 obese individuals
- Dietary record and evaluation of health risks to identify metabolically healthy, versus unhealthy obese patients
- Increased DII associated with significantly increased risk for MUO
- Increased risk of DM, HTN, CVD, High TG, Low HDL

**SUMMARY**

- Vascular disease is an inflammatory process
- Obesity is an inflammatory setting
- Vascular specialists need to encourage lifestyle modifications
  - Smoking cessation
  - Regular exercise
  - Weight loss
  - Improved sleep habits
  - Stress relief methods
- DIET!! – we need to embrace diet modifications to reduce systemic inflammation
  - We should have available dietary recommendations for patients
  - Dietary changes may have as much effect as statin therapy for our patients
  - We need to lead the way in helping our patients reduce systemic inflammation