Nutrition and Myositis

What we know (and don’t)

Renee Lantner
Talk Outline

- Eating healthy in general
- Nutritional abnormalities in chronic disease
- Specific supplements and diets related to myositis
“It’s not rocket science”

- Eat healthy foods
- Eat moderate portion sizes
- Eat a varied diet
- Enjoy your meals
- Involve yourself in meal preparation
We are so much more than our myositis

We are what we are thanks to our genes and our environment

We do have control over some things

We unfortunately can also get:

- Diabetes
- Heart disease
- Cancer
- Alzheimer’s
Anti-oxidants

Decrease oxidative stress, especially in heart disease and cancer

- Water-soluble, e.g. vitamin C
- Fat-soluble, e.g. carotene, vitamin E, CoQ10
- Found in vegetables, fruits, beans, nuts, herbs and spices
- Supplements are not as effective as whole foods (fiber, other compounds)
Anti-oxidants

Foods richest in antioxidants:
- Beans, like red, kidney and pinto
- Artichoke hearts
- Berries
- Apples and plums
- Green tea
- Dark chocolate!!

Balance!!
- Over-eating of one type can result in mineral binding, e.g. calcium, zinc, iron
- Oxalates (cocoa, spinach), phytates (legumes, whole grains), tannins (tea, beans, cabbage)
Eat Your Veggies (and Fruits)

- All vegetables provide good nutrients and fiber with some exceptions:
- Corn and white potatoes have a high-glycemic index
- Other veggies can nearly be eaten in unlimited quantities with a healthy preparation
- Fruit: “One is a serving; two or more is dessert”
- Juice: how many apples or oranges would you eat?
Carbohydrates: Our love-hate relationship

- Sugar really can be addictive; eliminating it causes decreased desire
- Learn to lower your glycemic load
- Avoid all processed foods
- “Fight the white”: Grains should be whole-grain, such as bulgur wheat, brown rice, quinoa
- No high-fructose corn syrup!!
- Avoid soda: sugary ones are worse, but diet ones still contain phosphoric acid
And then there are the fats…

- Our society has an imbalance of omega-6 and omega-3 fatty acids, also called PUFAs.
- Major factor responsible for obesity epidemic.
- Omega-3 = anti-inflammatory.
- Omega-6 (in excess) = pro-inflammatory.
- Early human diet was 1:1 of 6:3 PUFAs; now it is 10:1 -15:1 or higher.
Fatty Acids: Omega-6

- Food sources: linoleic acid (LA)
  - Soy, safflower, corn, sunflower, grapeseed
  - May be more pro-inflammatory than helpful
- GLA (gammalinolenic acid)
  - May be anti-inflammatory and helpful for autoimmune disorders
  - Found in black currant, borage and evening primrose oils
  - Avoid doses of borage oil over 2 grams/day, unless free of pyrrolizidine alkaloids, which may damage the liver
Fatty Acids: Omega-3

- Alpha-linolenic acid (ALA): flaxseeds and walnuts richest sources as well as canola; ALA → EPA → DHA
- EPA and DHA: oily fish major sources as well as enriched eggs
- Supplements: fish oil has EPA and DHA; algal and fungal sources have DHA
Fatty Acids: Omega-3

- Can decrease production of inflammatory molecules, including TNF-alpha
- May increase the efficacy of anti-TNF-alpha therapy
- Eating oily (wild-caught) fish 1-3 times a week may be enough
- EPA 2-3 grams per day as supplement
What fats to eat?

Cooking oils: olive (extra-virgin), walnut, flaxseed, coconut (medium chain saturated fat), expeller-pressed organic canola, sunflower or safflower

Food sources: fish (salmon, sardines, herring), omega-3 fortified eggs, hemp, chia seeds and flaxseeds

Nuts, especially walnuts, cashews, almonds

And....a weed??
Purslane

- You probably have it in your yard
- More Ω-3 fatty acids (ALA) than any other leafy plant
- Use as you would spinach
- Can be eaten raw, stir-fried, in soups
What fats not to eat?

- Simple: Avoid any partially hydrogenated fats
- Avoid corn, cottonseed, safflower, vegetable, and sunflower oils*
- Avoid fried foods: potential for *trans*-fats or toxic compounds with high heat

*unless expeller-pressed, organic
Anti-Inflammatory Diet

- Avoid processed foods: eat “whole foods”, the way nature intended it
- Avoid sugar, high-fructose corn syrup
- Eat lean protein, more fish and whole soy products, less animal protein
Anti-Inflammatory Diet

- Remember those vegetables
- Broth-based soups
- Green, white or oolong tea
- Chocolate! (at least 70% cocoa)
- Consider eating organically
In a 2007 study, Rose Mary Istre found those with myositis who followed an AID over 12 weeks had improved:
- Ease of routine activities
- Severity of depression
- Grip, arm and leg strength measurements
Consider Eating Organic

- Unclear if pesticides, etc. are harmful for (or trigger??) autoimmune disease
- Organic foods are also non-genetically-modified (non-GMO)
- GMO foods can have animal genes inserted into fruit/vegetable genes
The “Dirty Dozen”: “Buy organic or not at all”

- Peaches
- Apples
- Bell peppers
- Celery
- Nectarines
- Strawberries
- Carrots
- Cherries
- Kale
- Grapes
- Blueberries
- Spinach
- Potatoes
- Grapes (imported)

www.thedailygreen.com
The “Clean Fifteen”: Lowest in Pesticides

- Onions
- Avocados
- Sweet corn
- Pineapple
- Mango
- Asparagus
- Sweet peas
- Sweet potato

- Kiwi
- Cabbage
- Eggplant
- Papaya
- Watermelon
- Broccoli
- Tomatoes

www.thedailygreen.com
So remember…

Eat the rainbow!

- Include lots of foods - *whole and fresh* - that are red, orange, green, blue and yellow

“Fight the white”:

Avoid…

- White sugar (or too much of any kind, really)
- White potatoes
- White rice
- White bread (or maybe all wheat bread….)
Curcumin

Active ingredient in turmeric (think curry and mustard)

Inhibits inflammation with interest in cancer, inflammatory disease and Alzheimer’s

2007 study in mice: blunting of CK increase with exercise-induced muscle damage
Davis J. Am J Physiol Integr Physiol 2007;292:R2168

2008 study in mice improvement with muscular dystrophy
Pan Y. Mol Cells. 2008;25(4):531
Curcumin

- Seems to accumulate best in colon
- Holds promise for GI-related conditions
- Curcumin is very poorly absorbed
- Doses less than 4 grams per day were not detected in serum in human clinical studies
- New formulations, such as nanoparticles are being investigated to increase its availability
Curcumin

- Need to combine with piperines (black pepper extract) to improve absorption
- May increase bleeding in those taking drugs like coumadin
- Because of its inhibitory effect on COX-1 and COX-2, might increase risk of cardiac disease
- Have a good lipid profile as safeguard
Coenzyme Q10 (ubiquinone)

- Reduction in CoQ10 could cause abnormal mitochondrial dysfunction
- Statins lower CoQ10, but studies have not shown that supplements increase levels
- “The present evidence does not support [its] supplementation in statin-induced myopathy.”

Schaars C and Stalenhoef, 2008 Current Opinion in Lipidology
The problem with CoQ10

- No great data for its use in myositis (IIM)
- As we age, CoQ10’s absorption, biosynthesis and conversion to ubiquinol decreases
- Ubiquinol form is better absorbed and probably more effective
- Does it matter? (Serum vs. tissue levels)
- Interest in cardiac, neurologic and periodontal diseases
- 150 mg daily of ubiquinol used in studies
- Avoid if on coumadin
Boswellia

- May have positive effects on the immune system
- Clinical studies suggest efficacy in some autoimmune diseases including rheumatoid arthritis, Crohn's disease, ulcerative colitis and bronchial asthma
Vitamin D

- Clearly seems to have a role in preventing autoimmune disease (patients with DM/PM, RA, SLE, etc. found deficient)
- Its role in treatment less clear
- However, supplementation in statin-induced myositis patients reversed symptoms in 87% of the 150 patients studied

Glueck C. Current Med Res Opin 2011;27:1683
Vitamin D

- Important to support bone health, mental health and especially those avoiding the sun
- Blood levels above 30 considered adequate
- Treatment for deficiency: 2000 IU/day of vitamin D$_3$ or 50,000 IU/week of vitamin D$_2$
- Decreased by steroid use
Folate (folic acid or B9)

- A must for anyone taking methotrexate to decrease its side effects:
  - Decreased white blood cells, GI symptoms, hair loss, liver and lung toxicity
- One should also ensure adequate vitamin $B_{12}$ intake since its deficiency can be masked by folate deficiency
Probiotics

- Observed increase in autoimmune disease with decrease in beneficial bacteria
- Autoimmunity associated with “leaky gut”, allowing antigens to enter and stimulate the immune system
- In many autoimmune conditions, improving intestinal inflammation improves symptoms
Probiotics

Use of probiotics in mice: improvements or prevention of RA, MS and type-1 diabetes

Improvement seen with periodontitis

Dietary sources: yogurt, kefir or lassi with live cultures, aged cheese, fermented foods (brine-cured, non-vinegar pickles, sauerkraut, kimchi, miso)
Probiotics

- Bacterial supplements should have billions of cultures and include Bifidobacterium, lactobacilli (casei, rhamnosus)
- Caution in those immune-suppressed:
  - Bacterial infections may result; rare cases of sepsis reported in infants and adults with malignancy, cardiac (valve) disease, diabetes or advanced age
  - Rare fungal infections reported in those taking the probiotic yeast, Saccharomyces boulardii (Florastor)
Other supplements

- Vitamins C and E: no good data
- L-carnitine: no good data
- Glutamine:
  - Because it inhibits muscle wasting and preserves muscle protein, it may help myotonic muscular dystrophy
  - Can raise methotrexate levels; no good data on myositis
Supplements that may do more harm than good

- Spirulina (*S. platensis*) and blue-green algae (*Aphanizomenon flos-aquae*)
  - At least two patients with DM had a flare or onset of their disease after taking these
    - Lee A. *Arch Dermatol* 2004;140:723
    - Konno T. *Rinsho Shinkeigaku* 2011;51:330

- Echinacea (purple coneflower)
  - Has produced flares of lupus, including kidney-related complications

- Alfalfa
  - Has caused lupus-like symptoms in animals
  - Sprouts and tablets have been linked to lupus in humans
There is hope…

Diets and supplements with some evidence regarding myositis
Gluten Sensitivity

- Association of myositis with gluten sensitivity described since at least 1976
- There have been reports of clinical improvement following a gluten-free diet in PM, DM and IBM
- Not all patients will have positive antibodies (anti-glutaminase/gliadin/endomysial, etc.)
Gluten Sensitivity

Symptoms can range from none to:

- Weight loss
- Abdominal cramping
- Bloating
- Loose stools
- Anemia
- Evidence of bone loss
- Vitamin E deficiency
Gluten sensitivity: Substitutions

- Brown rice
- Quinoa
- Buckwheat
- Millet
- Sorghum
- Teff
- Amaranth
- Tapioca

Many available as:
- Breads
- Pasta
- Cereals
- Flours
Creatine: Definitions and clarifications

- **Creatinine**: metabolized end-product of creatine, found in blood, muscle and urine; *measured to assess renal function*

- **Creatine kinase (CK) or creatine phosphokinase (CPK)**: muscle enzyme involved in energy production; *measured to assess skeletal muscle inflammation or damage*, as well as in brain and heart muscle
Supplements: Creatine

- Taken as a daily supplement to improve muscle strength and/or mass
- A 2011 Cochrane review deemed it a worthwhile supplement with few side effects for those with DM and PM
- Most data was taken from a 2007 study done in the UK and Sweden (Dr. Ingrid Lundberg was a co-author)
  - Chung et al. *Arthr Rheum* 2007;57:694-702
Supplements: Creatine

Dosage used in the 2007 study:
- Start with 20 grams per day for 8 days (loading dose)
- Continue with 3 grams per day (maintenance dose)

Noted improved performance, ability to undertake high-intensity exercise and endurance work

Effect maintained over 5 months
Supplements: Creatine

- Safety: there were no side effects noted.
- Previous concerns about renal (kidney) toxicity do not seem warranted, as long as there is no underlying renal disease.
- Unfortunately, this does not seem to be effective for inclusion-body myositis (IBM).
Summary

Eat a varied diet of mainly fresh plant-based foods, lean (wild, organic?) protein, good fats, avoiding bad fats processed and high-glycemic foods

Focus on whole foods rather than supplements

For all: consider probiotics (especially if antibiotics used frequently)

Probably avoid spirulina and blue-green algae, possibly alfalfa, echinacea
Summary

- For all, but DM especially: check vitamin D level
- For anyone on MTX: take folic acid
- For PM, DM, IBM: consider gluten-free trial
- For PM, DM: consider creatine
- Stay hopeful for more data on coenzyme Q10 and curcumin-piperine, but worth a try
Resources: General

Center for Science in the Public Interest
www.cspinet.org

American Society for Nutrition
www.nutrition.org

Tufts University Healthletter
Healthletter.tufts.edu
Resources: Drug interactions

- http://drugs.com/drug_interactions

Very detailed with options for interactions between drug, herbs and supplements, and labs, some as positive interactions.
Resources: Supplements

Office of Dietary Supplements
Dietary-supplements.info.nih.gov

Linus Pauling Institute (Oregon State U.)
http://lpi.oregonstate.edu/

National Center for Complementary and Alternative Medicine (NIH)
nccam.nih.gov

www.consumerlab.com
(Reports on independent supplement testing)
Resources: Books

- *Wheat Belly* by William Davis, MD  
  (gluten sensitivity); www.wheatbellyblog.com

- *Eat to Live* and *Super Immunity* by Joel Fuhrman, MD  
  (general healthy eating); www.drfuhrman.com

- *The Probiotics Revolution* by Gary Huffnagle, PhD

- *Integrative Rheumatology* by Randy Horwitz, M.D. and David Muller, M.D.

- *Nutrition and Rheumatic Disease*, edited by Laura Coleman, PhD, RD (textbook)