

Diabetes and Inflammation: Inflammatory Effects of Foods and Chemicals

Presentation Objectives:

1. Identify strategies to reduce inflammation through healthy eating and reduce complications in diabetes
2. Discuss the mechanisms behind dietary causes of inflammation
3. Differentiate between three different types of hypersensitivity reactions that promote inflammation

Content Outline: Brief description of presentation:

1. Discuss Inflammation and Oxidative Stress in Diabetes and the triggers that result in chronic inflammation. Identify 3 strategies to reduce inflammation and associated complications in diabetes.
2. Discuss the mechanisms behind dietary causes of inflammation:
 - A. Inflammatory processes are initiated by diet
 - B. Chronically elevated levels of pro inflammatory mediators contribute to endothelial dysfunction, vascular changes and co morbid symptoms of DM
 - C. The gut is the seat of immune responses
3. Differentiate between three different types of hypersensitivity reactions that promote inflammation
 - A. Type 1
 - B. Type 3
 - C. Type 4

Non-IgE mediated adverse food reactions can be an important symptom provoking component of diabetes and co-morbid symptoms of DM. They are a common cause of many chronic conditions and affect an estimated 15-20% of the general population.

Diabetes and Inflammation: Inflammatory Effects of Foods and Chemicals

At least four of the ten leading causes of death in the USA – diabetes, heart disease, stroke, and cancer – are directly related to the way we eat. Diabetes is a chronic, progressive illness that requires continuing medical care and patient self-management to prevent acute complications and to reduce the risk of long-term complications. Diabetes has a significant impact on the health, quality of life, and life expectancy of individuals, as well as on the healthcare system. Along with diabetes medications and physical activity food choices play a critical role in diabetes management. The control of diet, exercise and behavior are the cornerstone for the management of diabetes. Evidence suggests that inflammation is the underlying cause of the long term complications resulting from uncontrolled diabetes.

Health begins with digestion since digestive problems affect nutrient absorption and wellness in all areas of our lives. A stressed digestive tract is a primary source of inflammation. Allergies, food sensitivities, parasites, yeast overgrowth, and emotional stress can all inflame the GUT and affect nutrient absorption.

Inflammation is the body's response to injury, and it is common in many tissues. This protects us against pathogens and infections. Inflammation can be acute or chronic. Reducing chronic inflammation is important for health because current research shows

that inflammatory disorders are the underlying cause of most chronic diseases and inflammation is linked to oxidative stress.

Cytokines are proteins produced and released by the cells in the immune system that help regulate immune response. Overproduction or inappropriate production of certain cytokines by the body can result in disease.

Oxidative Stress occurs when free radicals outnumber protective antioxidant defenses. Free radicals cause oxidative / DNA damage to cells and this results in inflammation. Type 2 diabetes is associated not only with increased reactive oxygen species, but in many instances with a reduction in these antioxidant defenses as well. Individuals with diabetes frequently have elevated levels of oxidative stress and are considered to be in a chronic pro inflammatory state.


The four basic types of triggers that result in chronic inflammation are: Toxin exposure, Dysglycemia, Oxygen metabolism, and Immune-mediated adverse food reactions.


Nutrients in food provide the foundation for health and the gastrointestinal health is very important for nutrient absorption. Digestion and absorption of nutrients in food is compromised by food allergies, food intolerances, food sensitivities, and toxic reactions to endogenous and exogenous chemicals in foods. Conversely the ability to properly digest foods extract and absorb nutrients can be compromised by luminal hypersensitivity reactions to benign antigens or food additives creating a vicious cycle which is difficult to break without patient specific intervention based on specific identification of food allergies, non-allergic hypersensitivities and toxic chemical reactions.

It is important to be certain to become aware of signs and symptoms associated with allergic and non-allergic hypersensitivities to foods and food additives. There are now new tests available and dietary interventions based on those technologies have shown significant benefits. Interventions focused on restoring balance in oxidative metabolism will work simultaneously to reduce the effects of oxidative stress as an inflammatory trigger, as well as release of reactive oxygen species as a mediating response of the body.

Resources/References


Diet and Diabetes
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2007 09 Obesity
wt loss study.pdf


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A low-fat vegan
diet and type 2 aft


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American Diabetes Association: Clinical Practice Recommendations 2009. Diabetes Care, volume 32, Supplement 1, January 2009.

High-Fat Meal Induces Low Grade Endotoxemia:

Errodge, C., Attina, T., Spickett, C.M., Webb, D.J. (2007). *A high-fat meal induces low-grade endotoxemia: Evidence of a novel mechanism of postprandial inflammation*. *American Journal of Clinical Nutrition*, 85(5), 1286-1292.

International Food Information Council: <http://ific.org/>

Vegetarian Diets May Protect Against Obesity, Type 2 Diabetes CME

News Author: Laurie Barclay, MD

CME Author: Désirée Lie, MD, MSED

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May 14, 2009 — Vegan and vegetarian diets may protect against obesity and type 2 diabetes, according to the results of a cohort study reported in the May issue of *Diabetes Care*. The National Institutes of Health and the School of Public Health, Loma Linda University, supported this study. The study authors have disclosed no relevant financial relationships. *Diabetes Care*. 2009;32:791-796. Type of Vegetarian Diet, Body Weight, and Prevalence of Type 2 Diabetes *Diabetes Care* May 2009 32:791-796; Tonstad S, Butler T, Yan R, Fraser GE. Department of Health Promotion and Education, School of Public Health, Loma Linda University, Loma Linda, California, USA.

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Grape Seed Extract May Benefit Type 2 Diabetics

<http://www.vitasearch.com/CP/weeklyupdates/>

Reference: "Effects of grape seed extract in Type 2 diabetic subjects at high cardiovascular risk: a double blind randomized placebo controlled trial examining metabolic markers, vascular tone, inflammation, oxidative stress and insulin sensitivity," Kar P, Laight D, et al, *Diabetic Medicine*, 2009; 26(5): 526-531. (Address: Dr P. Kar, Academic Unit of Diabetes and Endocrinology, Queen Alexandra Hospital, Portsmouth, PO6 3LY UK.

Resources

Almonds Are In: www.AlmondsAreIn.com

DASH Diet: www.DASHdiet.com

Eat Right: American Dietetic Association www.eatright.org

Food for Life TV: <http://www.foodforlife.tv/>

CEUs4U: www.ceu4u.net

Nutrition MD: <http://www.nutritionmd.org/index.html>

Nutrient Rich Foods Coalition: www.NutrientRichFoods.org

PCRM Food for Life Resources for Diabetes: <http://www.pcrm.org/health/diabetes/>

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Resistant Starch: http://en.wikipedia.org/wiki/Resistant_starch

VitaSearch: Clinical Pearls Online Weekly Research Updates
<http://www.vitasearch.com/CP/weeklyupdates/>