

Disclosures

Complementary Medicine for the Management of Type 2 Diabetes

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- none

Learning Objectives

- Identify natural products and dietary supplements associated with an anti-hyperglycemic effect.
- Describe safety and efficacy data associated with the most commonly used agents for diabetes management.

Learning Objectives

- Identify important drug-drug interactions associated with the most commonly used agents for diabetes management.
- List three items that should be clearly identified on the package labeling before recommending a particular herbal or dietary supplement.

Complementary and Alternative Medicine (CAM)

- Many and varied practices
 - Alternative Medical Systems
 - Mind-body interventions
 - Manipulative/body-based methods
 - Biologically-based treatments
- Characteristics of those that use CAM:
 - Female
 - Higher education
 - Middle age

Harris PE, et al. Int J Clin Pract 2012;66:924-939.

Federal Regulations

- 1994 Dietary Supplement Health and Education Act (DSHEA)
 - nutrient content (such as “high in calcium”)
 - “structure-function” or nutrition support (for example, “vitamin C prevents scurvy” or “calcium builds strong bones”)
 - disease claims

ADA guidelines

- No clear evidence for vitamin or mineral supplements
- Insufficient evidence to support the use of herbs/supplements for diabetes
- Individualize meal planning

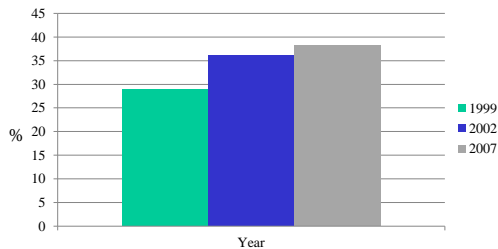
Diabetes Care. 2015 Jan;38 Suppl:S1-S94

AACE

- “Many popular remedies and self-treatment strategies have been found to be unproven scientifically and AACE does not recommend their use.”

Endoc Pract. 2003;9(No. 5):1-54

Use of Complementary Medicine (USA Government survey data)



Harris PE, et al. Int J Clin Pract 2012;66:924-939.

Mr. CAM

- 63 y/o native american male patient
- No microvascular complications
- Has CKD stage 3 with eGFR 50-55, but no microalbuminuria
- Recently started checking home blood sugar readings, all fasting readings >200mg/dL

DATE	A1c	CHO	TRI	HDL	LDL
12/9/14	9.0 H	196	320 H	34 L	98
5/5/14	8.1 H	159	152	43	86
1/31/14	7.7 H	244 H	250 H	34 L	160 H

CAM for Diabetes: Cinnamon

- MOA:
 - ↑ Insulin sensitivity
 - ↓ Glucose uptake
 - ↑ Glycogen synthesis
 - ↓ Gastric emptying



- Evidence:
 - Small decrease in fasting (BS 15mg/dL)
 - Small decrease in (A1c 0.09%)

Ann Fam Med. 2013;11(5):452-459
Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

CAM for Diabetes: Cinnamon (continued)

- Dose: 1-6 g/day
- Side effects:
 - GI upset
 - May cause magnesium accumulation in CRI



Diabetes Care 2008;31:41-43
Cochrane Database Syst Rev 2012; Sep 12;9:CD007170. doi:10.1002/14651858.CD007170.pub2.

CAM for Diabetes: Cinnamon (continued)



- Drug Interaction
 - Cassia cinnamon contains coumarin-type component
 - Ceylon cinnamon does NOT

Diabetes Care 2008;31:41-43.
J Am Diet Assoc. 2008;108(4 Suppl 1):S59-S65

CAM for Diabetes: Gymnema (*Gymnema sylvestre*)



- MOA:
 - ↑Insulin secretion
 - ↑Beta cell regeneration
 - ↑Peripheral glucose utilization
- Evidence:
 - Decrease in fasting BS 2.78 mmol/L (50.04mg/dL)
 - Decrease in A1c 3.43%
 - Elevations in serum insulin levels

Diabetes Care 2003;26(4):1277-1294
J Ethnopharmacol. 1990;30(3):295-300

CAM for Diabetes: Gymnema (continued)



- Dose: 400mg/day
- Side effects:
 - Taste alteration
 - Diminished perception of sweet taste
 - Enhanced perception of bitter taste

Diabetes Care 2003;26(4):1277-1294

CAM for Diabetes: Gymnema (continued)



- Drug Interactions
 - Antilipemic agents
 - Antiobesity agents
 - Secretagogues

Diabetes Care 2003;26(4):1277-1294
Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

CAM for Diabetes: Fenugreek (*Trigonella foenum-graecum*)



- MOA:
 - Delay gastric emptying
 - Slowed CHO absorption
 - ↑ Insulin sensitivity
- Evidence:
 - Suksomboon et al found 1.13% decrease in A1c but no effect on fasting BS
 - Neelakatan et al found 0.85% reduction in A1c, 17.28mg/dL in fasting BS and 39.42mg/dL in 2 hour BS

Nutr J. 2014;13:7
J Ethnopharmacol. 2011;137(3):1328-1333
Acta Diabetol. 2004;41(3):91-98
J Ethnopharmacol. 2002;81(1):81-100

CAM for Diabetes: Fenugreek (continued)



- Dose: 5-100 grams/day of fenugreek seed powder
- Side effects:
 - Dyspepsia - Abdominal distension
 - Hypokalemia - Blood thinning
 - Not recommended in individuals allergic to members of the Fabaceae family

J Am Diet Assoc. 2008;108(4 Suppl 1):S59-S65
Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

CAM for Diabetes: Fenugreek (continued)



- Drug interactions:
 - Separate from other oral medications by at least 2 hours
 - Caution with potassium-depleting agents
 - Warfarin

J Am Pharm Assoc. 2002;42(2):217-226
Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

CAM for Diabetes: Nopal (*Opuntia streptacantha*)



- MOA
 - ↑Insulin sensitivity
 - ↓CHO absorption
 - ↓Lipid absorption
- Evidence
 - Decrease fasting glucose

Acta Diabetol. 2004;41(3):91-98
Diabetes Care 2003;26(4):1277-1294

CAM for Diabetes: Nopal (continued)



- Dose
 - 100-600 grams/day
- Side effects
 - Diarrhea
 - Asthma
 - Allergic nasal inflammation

J Am Diet Assoc. 2008;108(4 Suppl 1):S59-S65
Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015
Diabetes Care 2003;26(4):1277-1294
Acta Diabetol. 2004;41(3):91-98

CAM for Diabetes: Nopal (continued)



- Drug Interactions
 - Anticoagulants/anti-platelet agents
 - Cholesterol-lowering agents
 - Secretagogues

Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

CAM for Diabetes: Red Onion (*Allium cepum*)



- MOA
 - ↑Insulin secretion
 - ↑ Glycogen storage
- Evidence
 - Decrease fasting glucose

Diabetes Care. 2003;26(4):1277-1294
J Ethnopharmacol. 2002;81(1):81-100

CAM for Diabetes: Red Onion (continued)



- Dose
- Side effects
 - Heartburn
 - Dyspepsia
 - Lowered blood pressure

J Ethnopharmacol. 2002;81(1):81-100.
Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

CAM for Diabetes: Red Onion (continued)

- Drug Interactions
 - P-glycoprotein substrates
 - May increase bleeding risk



Mr. CAM

- 63 y/o native american male patient
- No microvascular complications
- Has CKD stage 3 with eGFR 50-55, but no microalbuminuria
- Recently started checking home blood sugar readings, all fasting readings >200mg/dL

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Natural Standard. <https://naturalmedicines.therapeuticresearch.com>. Accessed January 29, 2015

Ms. CAM

- 28 y/o female with type 2 diabetes
- Obese
- Requesting herbal supplement to use in addition to metformin for glycemic control
- No other disease states
- Allergic to ragweed and peanuts

Conclusion

- 400+ herbal agents with potential anti-hyperglycemic effects
- No conclusive evidence
- Routinely ask and assess
- Encourage patients to seek advice and consider as adjuncts to Rx

J Clin biochem Nutr. 2007;40(3):163-173
 J Ethnopharmacol. 2011;137(3):1328-1333
 Adv Clin Exp Med. 2014 Nov-Dec;23(6):939-46

Prior to Recommendation

Elements that should be clearly identified

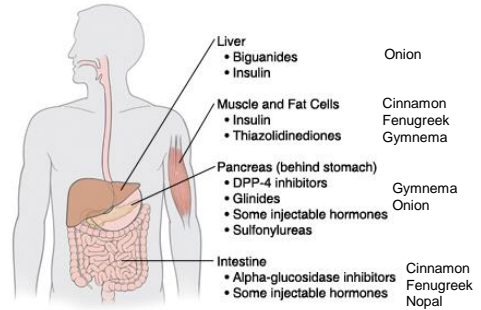
- Common or scientific name of product
- Dosage of the botanical
- Part of the plant from which it was made
- Active and other ingredients
- Manufacturer's name and address, lot number and date of manufacture and expiration

Tips and Resources for Providers

- Talk openly with patients about use of CAM
- Resources

Resources

Patients	Providers
NIH Office of Dietary Supplements www.ods.od.nih.gov	NIH Office of Dietary Supplements www.ods.od.nih.gov
National Center for Complementary and Alternative Medicine: http://nccam.nih.gov/	U.S. Pharmacopeia www.usp.org
Natural Medicines Comprehensive Database www.naturaldatabase.com	Natural standard: www.naturalstandard.com
http://quackwatch.com/	American Botanical Council http://www.herbmed.org/
Tips for the Savvy Supplement User http://www.fda.gov/Food/DietarySupplements/UsingDietarySupplements/ucm110567.htm	McWhorter, LS: Complementary and Alternative Medicine (CAM) Supplement Use in People with Diabetes: A Clinician's Guide



Modified from <http://www.fairview.org/healthlibrary/Article/89519> Accessed February 18, 2015

Educators – the Superheros of diabetes self-management

