Eye on Nutrition

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Please be advised that I have no financial relationship with any commercial interests. I am employed full-time by Aran Eye Associates (since 2014).

Steven M Newman OD

Conditions ODs see daily that are affected by nutrition/lifestyle

Macular degeneration - SMOKING

Dry Eye – sponge / freshly waxed car

Diabetes – more to come

Hypertension – heart healthy diet

Hypercholesterolemia (disease?) – separate lecture

Contact Lens wearer – lubrication / case care (or not)

Nutrition/Lifestyle affects every person that walks into your office

Lifespan v Healthspan


A TIP FROM A
FORMER
SMOKER

Diabetes

Types of diabetics (all patients in general)

- Type 1
- Type 2
- Type 3? (brain insulin resistance drives neurodegeneration)

Definitions + Parameters
Directed questions to ask
Current treatments
Current nutritional recommendations

di·a·be·tes
/ˌdīəˈbēdēz,ˌdīəˈbēdəs/

noun: **diabetes**; noun: **diabetes mellitus**
a disease in which the body's ability to produce or respond to the hormone insulin is impaired, resulting in abnormal metabolism of carbohydrates and elevated levels of glucose in the blood and urine.

Diabetes : Parameters

The higher your blood sugar levels, the more hemoglobin you'll have with sugar attached. An A1C level of 6.5% or higher on two separate tests means that you have diabetes. An A1C between 5.7% and 6.4% means that you have prediabetes. Below 5.7% is considered normal.

Continuous glucose monitors (CGMs)

People living with diabetes may choose to use CGMs,
especially people who have type 1 diabetes.
CGMs measure blood sugar every few minutes.
They use a device placed on the skin along with a sensor placed under the skin.
These sensors last for up to 6 months.

Effect of diet on type 2 diabetes mellitus: A review

Waqas Sami [1,2,✉], Tahir Ansari [3], Nadeem Shafique Butt [4], Mohd Rashid Ab Hamid [1]

. 2017 Apr-Jun;11(2):65–71.

The objectives of this review are to examine various studies to explore relationship of T2DM with different dietary habits/patterns and practices and its complications.

Effect of diet on type 2 diabetes mellitus: A review

Dietary habits and sedentary lifestyle are the major factors for rapidly rising incidence of DM among developing countries. In type 2 diabetics, recently, elevated HbA1c level has also been considered as one of the leading risk factors for developing microvascular and macrovascular complications. Improvement in the elevated HbA1c level can be achieved through diet management; thus, the patients could be prevented from developing the diabetes complications.

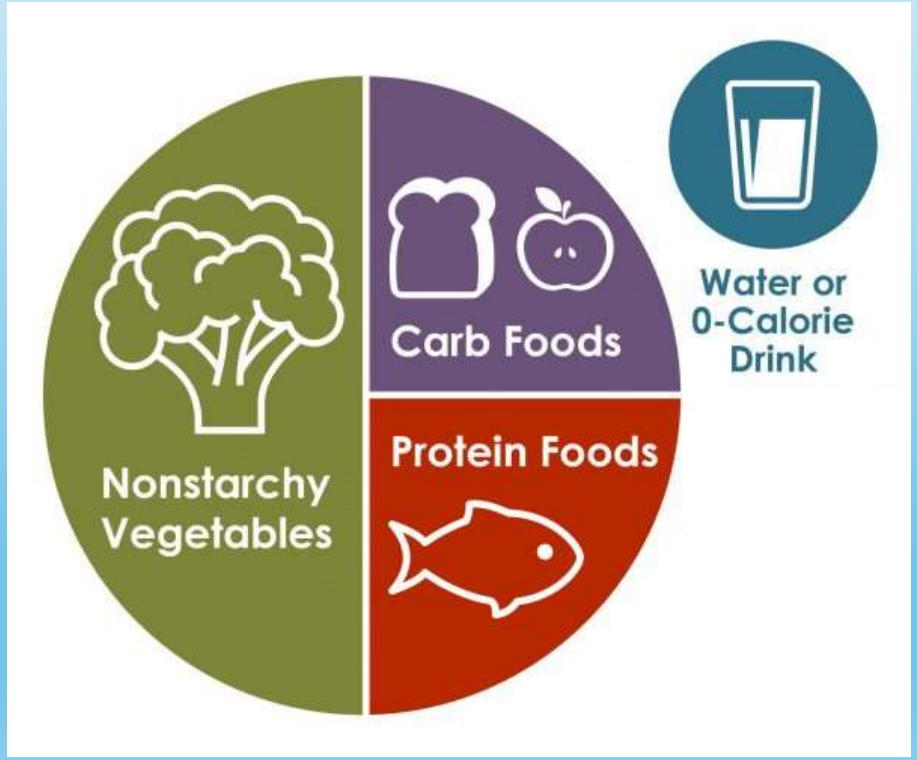
Effect of diet on type 2 diabetes mellitus: A review

American Diabetes Association has defined self-dietary management as the key step in providing the diabetics, the knowledge and skill in relation with treatment, nutritional aspects, medications and complications. A study showed that the dietary knowledge of the targeted group who were at high risk of developing T2DM was poor. Red meat and fried food were consumed more by males as compared to females. The percent of males to females in daily rice consumption was significantly high

Effect of diet on type 2 diabetes mellitus: A review

Awareness about diabetes complications and consequent improvement in dietary knowledge, attitude, and practices lead to better control of the disease. The stakeholders (health-care providers, health facilities, agencies involved in diabetes care, etc.) should encourage patients to understand the importance of diet which may help in disease management, appropriate self-care and better quality of life.

Food Plate 9”


Nonstarchy Vegetables
Carb Foods
Protein Foods
Water or 0-Calorie Drink

Systematic review and meta-analysis of different dietary approaches to the management of type 2 diabetes

The American Journal of Clinical Nutrition

Volume 97, Issue 3, March 2013, Pages 505-516

Design

We conducted searches of PubMed, Embase, and Google Scholar to August 2011. We included randomized controlled trials (RCTs) with interventions that lasted ≥6 mo that compared:

- low-carbohydrate
- vegetarian
- vegan
- low–glycemic index (GI)
- high-fiber
- Mediterranean
- high-protein diets with control diets including low-fat
- high-GI
- America Diabetes Association
- European Association for the Study of Diabetes
- low-protein diets

Results

A total of 20 RCTs were included (n = 3073 included in final analyses across 3460 randomly assigned individuals). The low-carbohydrate, low-GI, Mediterranean, and high-protein diets all led to a greater improvement in glycemic control [glycated hemoglobin reductions of −0.12% (P = 0.04), −0.14% (P = 0.008), −0.47% (P < 0.00001), and −0.28% (P < 0.00001), respectively] compared with their respective control diets, with the largest effect size seen in the Mediterranean diet. Low-carbohydrate and Mediterranean diets led to greater weight loss [−0.69 kg (P = 0.21) and −1.84 kg (P < 0.00001), respectively], with an increase in HDL seen in all diets except the high-protein diet.

Conclusion

Low-carbohydrate, low-GI, Mediterranean, and high-protein diets are effective in improving various markers of cardiovascular risk in people with diabetes and should be considered in the overall strategy of diabetes management.

Big Pharma

Common Type 2 Diabetes Medications

There are different types, or classes, of medications that work in different ways to lower blood glucose levels. Some options are taken by mouth and others are injected. Some of the commonly used classes of non-insulin medications include:

Metformin

Dipeptidyl peptidase 4 (DPP-4) inhibitors

Glucagon-like peptide 1 (GLP-1) and dual glucose-dependent insulinotropic polypeptide (GIP) and GLP-1 receptor agonists

Sodium-glucose cotransporter 2 (SGLT2) inhibitors

Sulfonylureas

Thiazolidinediones (TZDs)

Metformin

Metformin (Glucophage) is classified as a biguanide medication and is the only available medication in this class. Metformin lowers blood glucose levels primarily by decreasing the amount of glucose produced by the liver. Metformin also helps lower blood glucose levels by making muscle tissue more sensitive to insulin so blood glucose can be used for energy.

It is usually taken two times a day. A side effect of metformin may be diarrhea, but this is improved when the drug is taken with food.

DPP-4 Inhibitors

DPP-4 inhibitors help improve A1C (a measure of average blood glucose levels over two to three months) without causing hypoglycemia (low blood glucose). DPP-4's work by preventing the breakdown of naturally occurring hormones in the body, GLP-1 and GIP. These hormones reduce blood glucose levels in the body, but they are broken down very quickly so it does not work well when injected as a drug itself.

By interfering in the process that breaks down GLP-1 and GIP, DPP-4 inhibitors allow these hormones to remain active in the body longer, lowering blood glucose levels only when they are elevated. DPP-4 inhibitors do not cause weight gain and are usually very well tolerated.

There are four DPP-4 inhibitors currently on the market in the U.S.

Alogliptin (Nesina)

Linagliptin (Tradjenta)

Saxagliptin (Onglyza)

Sitagliptin (Januvia)

GLP-1 and Dual GLP-1/GIP Receptor Agonists

As noted in the description for DPP-4 inhibitors, GLP-1 and GIP are natural hormones in the body that help maintain glucose levels. Use of GLP-1 and dual GLP-1/GIP receptor agonists is another strategy to help use these hormones to improve blood glucose management in people with type 2 diabetes.

GLP-1 and Dual GLP-1/GIP Receptor Agonists

These medications have similar effects to the GLP-1 and GIP produced in the body but are resistant to being broken down by the DPP-4 enzyme. These medications can result in large benefits on lowering blood glucose and body weight. Some agents in this class have also been shown to prevent heart disease. Most of these medications are injected, with the exception of one that is taken by mouth once daily, called semaglutide (Rybelsus).

Injectable GLP-1 receptor agonists currently on the market include:

Dulaglutide (Trulicity)

Exenatide (Byetta)

Exenatide extended-release (Bydureon)

Liraglutide (Victoza)

Lixisenatide (Adlyxin)

Injectable semaglutide (Ozempic, Manjaro, Wegovi, Victoza, etc…)

Risk of Thyroid Tumors With GLP-1 Receptor Agonists: A Retrospective Cohort Study

OBJECTIVE

To assess the association between glucagon-like peptide 1 receptor agonist (GLP-1RA) use and risk of incident thyroid tumors.

RESEARCH DESIGN AND METHODS

The retrospective, active-comparator new-user cohort study used international administrative claims and electronic health record databases. Participants included patients with type 2 diabetes mellitus (T2DM) with prior metformin therapy initiating a GLP-1RA versus new users of sodium–glucose cotransporter 2 inhibitors (SGLT2is), dipeptidyl peptidase 4 inhibitors (DPP-4is), and sulfonylureas (SUs). The outcome was incident thyroid tumor and thyroid malignancy. Propensity score matching and stratification were used to adjust for confounders with an intention-to-treat and on-treatment strategy. Cox regression was used to estimate hazard ratios (HRs) pooled using a random-effects meta-analysis. Unmeasured confounding was evaluated using negative outcomes, with calibration of the HR.

RESULTS

A total of 460,032 users of GLP-1RAs, 717,792 users of SGLT2is, 2,055,583 users of DPP-4is, and 1,119,868 users of SUs were included. Only U.S. cohorts passed study diagnostics. Thyroid tumor incidence ranged from 0.88 to 1.03 per 1,000 person-years in GLP-1RA cohorts. GLP-1RA exposure was not associated with an increased risk of thyroid tumors compared with SGLT2is, DPP-4is, or SUs (meta-analysis: GLP-1RA vs. SGLT2i HR range from 0.83 [95% CI 0.57–1.27] to 0.95 [0.85–1.06]; GLP-1RA vs. SU HR range from 0.95 [0.75–1.20] to 1.03 [0.87–1.23]; GLP-1RA vs. DPP-4i HR range from 0.78 [0.60–1.01] to 0.93 [0.83–1.04]). Analysis using thyroid malignancy and including a 1-year lag period produced similar conclusions.

CONCLUSIONS

In patients with T2DM initiating second-line treatments, we observed no increased risk of thyroid tumors with GLP-1RA exposure.

Risk of stroke and retinopathy during GLP-1 receptor agonist cardiovascular outcome trials:

An eight RCTs meta-analysis

Jinjing Wei [1,†], Bing Yang [1,†], Ruxin Wang [1], Haowen Ye [1], Ying Wang [1], Lihong Wang [1,2,*], Xiaofang Zhang [3,*]

•PMCID: PMC9760859 PMID: 36545339

Results

A total of 60,081 randomized participants were included in the data of these 8 GLP-1RA cardiovascular outcomes trials. Pooled analysis reported statistically significant effect on total stroke risk[RR=0.83, 95%CI(0.73, 0.95), *p*=0.005], and its subtypes such as ischemic Stroke [RR=0.83, 95%CI(0.73, 0.95), *p*=0.008] from treatment with GLP-1RA versus placebo, and have no significant effect on the risk of hemorrhagic stroke[RR=0.83, 95%CI(0.57, 1.20), *p*=0.31] and retinopathy [RR=1.54, 95%CI(0.74, 3.23), *p*=0.25]

Conclusion

GLP-1RA significantly reduces the risk of ischemic stroke in type 2 diabetics with cardiovascular risk factors.

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GLP-1 Receptor Agonists May Modestly Reduce Risk of Fourteen Obesity-Related Cancers for People with Diabetes

May 22, 2025

GLP-1 Receptor Agonists May Modestly Reduce Risk of Fourteen Obesity-Related Cancers for People with Diabetes

Key Findings

Patients who took GLP-1 receptor agonists had a 7% lower risk of developing an obesity-related cancer and an 8% lower risk of death from any cause compared to those who took a DDP-4 inhibitor.

In the GLP-1 receptor agonist group, there were 2,501 newly diagnosed cases of obesity-related cancer out of 85,015. In the DDP-4 inhibitor group, there were 2,671 cases of obesity-related cancer out of 85,015.

Researchers looked at the difference between the risk of obesity-related cancer in men and women:

- For men, there was not a statistically significant difference between the two treatment groups for either obesity-related cancers or all causes of death.
- Women treated with GLP-1 receptor agonists had an 8% lower risk of obesity-related cancer and a 20% lower risk of all causes of death compared to women treated with DDP-4 inhibitors.

Taking a GLP-1 receptor agonist was also protective against two related types of cancer: colon and rectal cancer:

- There were 16% fewer colon cancer cases and 28% fewer rectal cancer cases in the group prescribed GLP-1 receptor agonists.
- This group also did not have an elevated risk of any of the 14 obesity-related cancers.

Adverse effects + recommendations

GLP-1 drugs, used for managing type 2 diabetes and weight loss, can cause a range of side effects, with gastrointestinal issues being the most common. These include nausea, vomiting, diarrhea, and constipation. While these side effects are often mild and temporary, some individuals may experience more severe reactions or complications.

To minimize the loss of lean body mass (LBM) during weight loss, especially when using medications like GLP-1 receptor agonists, it's crucial to incorporate both resistance training and a high-protein diet

SGLT2 Inhibitors

Glucose in the bloodstream passes through the kidneys where it can either be excreted in the urine or reabsorbed back into the blood. Sodium-glucose cotransporter 2 (SGLT2) works in the kidney to reabsorb glucose. A new class of medication, SGLT2 inhibitors, block this action, causing excess glucose to be eliminated in the urine.

Key drugs in this class include canagliflozin (Invokana), dapagliflozin (Farxiga), empagliflozin (Jardiance), ertugliflozin (Steglatro), and bexagliflozin (Brenzavvy).

SGLT2 Inhibitors

By increasing the amount of glucose excreted in the urine, people can see improved blood glucose, some weight loss, and small decreases in blood pressure. Bexagliflozin (Brenzavvy), canagliflozin (Invokana), dapagliflozin (Farxiga), and empagliflozin (Jardiance) are SGLT2 inhibitors that have been approved by the Food and Drug Administration (FDA) to treat type 2 diabetes. SGLT2 inhibitors are also known to help improve outcomes in people with heart disease, kidney disease, and heart failure.

For this reason, these medications are often used in people with type 2 diabetes who also have heart or kidney problems. Because they increase glucose levels in the urine, the most common side effects include genital yeast infections.

Sulfonylureas

Sulfonylureas have been in use since the 1950s and they stimulate beta cells in the pancreas to release more insulin. There are three main sulfonylurea drugs used today, glimepiride (Amaryl), glipizide (Glucotrol and Glucotrol XL), and glyburide (Micronase, Glynase, and Diabeta). These drugs are generally taken one to two times a day before meals.

All sulfonylurea drugs have similar effects on blood glucose levels, but they differ in side effects, how often they are taken, and interactions with other drugs. The most common side effects with sulfonylureas are low blood glucose and weight gain.

TZDs

Rosiglitazone (Avandia) and pioglitazone (Actos) are in a group of drugs called thiazolidinediones. These drugs help insulin work better in the muscle and fat and reduce glucose production in the liver.

A benefit of TZDs is that they lower blood glucose without having a high risk for causing low blood glucose. Both drugs in this class can increase the risk for heart failure in some individuals and can also cause fluid retention (edema) in the legs and feet.

Take home message

We (as ODs) CAN make a difference

Ask the right questions

Have information available in office

Lead by example

Get involved

My Contact Info