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SIMPLE STEPS FOR PREVENTING DIABETES

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ABSTRACT

Diabetes is a major public health problem that is approaching epidemic proportions globally. There is an urgent need for strategies to curb the rising prevalence of this disease, and prevention appears a logical approach. Lifestyle modifications with weight loss and moderate exercise can reduce the incidence of diabetes by >50% in patients with impaired glucose tolerance (IGT). The use of metformin, acarbose and other agents have been shown in randomized prospective trials to prevent type 2 diabetes in high-risk subjects with IGT. Other pharmacological interventions are currently being examined in large prospective studies. It is likely that one or a combination of these approaches could make diabetes prevention a reality in the near future. Key for preventing type 2 diabetes can be boiled down to five words: Stay lean and stay active.

Keywords: Diabetes, prevalence, metformin, randomized, type 2 diabetes

INTRODUCTION

If type 2 diabetes was an infectious disease, passed from one person to another, public health officials would say we're in the midst of an epidemic. This difficult disease, once called adult-onset diabetes, is striking an ever-growing number of adults. Even more alarming, it's now beginning to show up in teenagers and children.

RELATED STUDIES

More than 24 million Americans have diabetes; of those, about 6 million don't know they have the disease. (American Diabetes, 2007) In 2007, diabetes cost the U.S. an estimated \$116 billion in excess medical spending, and an additional \$58 billion in reduced productivity. (American Diabetes) If the spread of type 2 diabetes continues at its present rate, the number of people diagnosed with diabetes in the United States will increase from about 16 million in 2005 to 48 million in 2050. (Narayan et al 2006) Worldwide, the number of adults with diabetes will rise from 285 million in 2010 to 439 million in the year 2030. ((Niniño 2007)

The problems behind the numbers are even more alarming. Diabetes is the leading cause of blindness and kidney failure among adults. It causes mild to severe nerve damage that, coupled with diabetes-related circulation problems, often leads to the loss of a leg or foot. Diabetes significantly increases the risk of heart disease. And it's the sixth leading cause of death in the U.S., directly causing almost 75,000 deaths each year and contributing to thousands more. (Heron, et al 2007)

The good news is that type 2 diabetes is largely preventable. About 9 cases in 10 could be avoided by taking several simple steps: keeping weight under control, exercising more, eating a healthy diet, and not smoking.

WHAT IS TYPE 2 DIABETES

Our cells depend on a single simple sugar, glucose, for most of their energy needs. That's why the body has intricate mechanisms in place to make sure glucose levels in the bloodstream don't go too low or soar too high.

When you eat, most digestible carbohydrates are converted into glucose and rapidly absorbed into the bloodstream. Any rise in blood sugar signals the pancreas to make and release insulin. This hormone instructs cells to sponge up glucose. Without it, glucose floats around the bloodstream, unable to slip inside the cells that need it. Diabetes occurs when the body can't make enough insulin or can't properly use the insulin it makes.

One form of diabetes occurs when the immune system attacks and permanently disables the insulin-making cells in the pancreas. This is type 1 diabetes, once called juvenile-onset, or insulin-dependent, diabetes. Roughly 5 to 10 percent of diagnosed diabetes cases are type 1 diabetes. (National Diabetes Statistics fact sheet)

TYPE 2 DIABETES IN CHILDREN

Type 2 diabetes used to be called adult-onset diabetes, since it was almost unheard of in children. But with the rising rates of childhood obesity, it has become

more common in youth, especially among certain ethnic groups.

In the U.S., the SEARCH for Diabetes in Youth Study found that type 2 diabetes accounted for only 6 percent of new diabetes cases in non-Hispanic white children ages 10 to 19, but anywhere from 22 to 76 percent of new cases in other ethnic groups (Search for Diabetes in Youth Study Group, 2006) The highest rates were found in Asia-Pacific Islander and Native American youth.

The other form of diabetes tends to creep up on people, taking years to develop into full-blown diabetes. It begins when muscle and other cells stop responding to insulin's open-up-for-glucose signal. The body responds by making more and more insulin, essentially trying to ram blood sugar into cells. Eventually, the insulin-making cells get exhausted and begin to fail. This is type 2 diabetes.

In addition to the millions of adults with diabetes, another 57 million adults have "pre-diabetes." (American Diabetes Association) This early warning sign is characterized by high blood sugar levels on a glucose tolerance test or a fasting glucose test. Whether pre-diabetes expands into full-blown type 2 diabetes is largely up to the individual. Making changes in weight, exercise, and diet can not only prevent pre-diabetes from becoming diabetes, but can also return blood glucose levels to the normal range.

TYPE 2 DIABETES CAN BE PREVENTED

Although the genes you inherit may influence the development of type 2 diabetes, they take a back seat to behavioral and lifestyle factors. Data from the Nurses' Health Study suggest that 90 percent of type 2 diabetes in women can be attributed to five such factors: excess weight, lack of exercise, a less-than-healthy diet, smoking, and abstaining from alcohol. (Hu et al, 2001)

Among 85,000 married female nurses, 3,300 developed type 2 diabetes over a 16-year period. Women in the low-risk group were 90 percent less likely to have developed diabetes than the rest of the women. Low-risk meant a healthy weight (body mass index less than 25), a healthy diet, 30 minutes or more of exercise daily, no smoking, and having about three alcoholic drinks per week.

Similar factors are at work in men. Data from the Health Professionals Follow-up Study indicate that a "Western" diet, combined with lack of physical activity and excess weight, dramatically increases the risk of type 2 diabetes in men. (Van Dam, 2002). Information from several clinical trials strongly supports the idea that type 2 diabetes is preventable. The Diabetes Prevention Program examined the effect of weight loss and increased exercise on the development of type 2 diabetes among men and women with high blood sugar readings that hadn't yet crossed the line to diabetes. In the group assigned to weight loss and exercise, there were 58 percent fewer cases of diabetes after almost three years than in the group assigned to usual care. (Knowler et al, 2002) Even after the program to promote lifestyle changes ended, the benefits persisted: The risk of diabetes was reduced, albeit to a lesser degree, over 10 years. (Knowler et al, 2009) Similar results were seen in a Finnish study of weight loss,

exercise, and dietary change, and in a Chinese study of exercise and dietary change. (Tuomilehto et al, 2001, Lindstrom et al, 2006, Pan, 1997, Li et al, 2008)

SIMPLE STEPS TO LOWER YOUR RISK

Making a few lifestyle changes can dramatically lower the chances of developing type 2 diabetes. The same changes can also lower the chances of developing heart disease and some cancers.

CONTROL YOUR WEIGHT

Excess weight is the single most important cause of type 2 diabetes. Being overweight increases the chances of developing type 2 diabetes seven fold. Being obese makes you 20 to 40 times more likely to develop diabetes than someone with a healthy weight. (Hu et al, 2001) Losing weight can help if your weight is above the healthy-weight range. Losing 7 to 10 percent of your current weight can cut your chances of developing type 2 diabetes in half.

GET MOVING

Inactivity promotes type 2 diabetes (Rana et al, 2007) Every two hours you spend watching TV instead of pursuing something more active increases the chances of developing diabetes by 14 percent. (Hu et al, 2003) Working your muscles more often and making them work harder improves their ability to use insulin and absorb glucose. This puts less stress on your insulin-making cells.

Long bouts of hot, sweaty exercise aren't necessary to reap this benefit. Findings from the Nurses' Health Study and Health Professionals Follow-up Study suggest that walking briskly for a half hour every day reduces the risk of developing type 2 diabetes by 30 percent. (Tanasescu, et al, 2003, Hu et al, 1999, Durgadevi and Nazni, 2012) More recently, The Black Women's Health Study reported similar diabetes-prevention benefits for brisk walking of more than 5 hours per week. (Krishnan et al, 2009)

This amount of exercise has a variety of other benefits as well. And even greater cardiovascular and other advantages can be attained by more, and more intense, exercise.

TUNE UP YOUR DIET

Four dietary changes can have a big impact on the risk of type 2 diabetes.

CHOOSE WHOLE GRAINS AND WHOLE GRAIN PRODUCTS OVER HIGHLY PROCESSED CARBOHYDRATES

There's a growing body of evidence that diets rich in whole grains protect against diabetes, whereas diets rich in refined carbohydrates lead to increased risk. In the Nurses' Health Studies I and II, for example, researchers looked at the whole grain consumption of more than 160,000 women whose health and dietary habits were followed for up to 18 years. Women who averaged two to three servings of whole grains a day were 30 percent less

likely to have developed type 2 diabetes than those who rarely ate whole grains. (de Munter et al,2007) When the researchers combined these results with those of several other large studies, they found that eating an extra 2 servings of whole grains a day decreased the risk of type 2 diabetes by 21 percent.

Whole grains don't contain a magical nutrient that fights diabetes and improves health. It's the entire package—elements intact and working together—that's important. The bran and fiber in whole grains make it more difficult for digestive enzymes to break down the starches into glucose. This leads to lower, slower increases in blood sugar and insulin, and a lower glycemic index. As a result, they stress the body's insulin-making machinery less, and so may help prevent type 2 diabetes. (Ludwig,et al, 2002; Nazni and Ravinder Singh, 2014) Whole grains are also rich in essential vitamins, minerals, and phytochemicals that may help reduce the risk of diabetes.

In contrast, white bread, white rice, mashed potatoes, donuts, bagels, and many breakfast cereals have what's called a high glycemic index and glycemic load. That means they cause sustained spikes in blood sugar and insulin levels, which in turn may lead to increased diabetes risk. (Ludwig,et al,2002) In China, for example, where white rice is a staple, the Shanghai Women's Health Study found that women whose diets had the highest glycemic index had a 21 percent higher risk of developing type 2 diabetes, compared to women whose diets had the lowest glycemic index.(Villegas et al,2007). Similar findings were reported in the Black Women's Health Study. (Krishnan et al, 2007)

SKIP THE SUGARY DRINKS

Like refined grains, sugary beverages have a high glycemic load, and drinking more of this sugary stuff is associated with increased risk of diabetes. In the Nurses' Health Study II, women who drank one or more sugar-sweetened beverages per day had an 83 percent higher risk of type 2 diabetes, compared to women who drank less than one sugar-sweetened beverage per month; drinking one or more servings of fruit punch per day doubled the risk of diabetes.(Schulze,et al,2004)

The Black Women's Health Study, which followed 59,000 African American women for 10 years, found a similar link between sugary soft drinks and type II diabetes. (Palmer et al, 2008) The study also suggests that fruit drinks—such as Kool Aid, fortified fruit drinks, or juices—are not the healthy choice that food advertisements often portray them to be: Women in the study who drank two or more servings of fruit drinks a day had a 31 percent higher risk of type 2 diabetes, compared to women who drank less than one serving a month.

(Schulze,et al,2004,Palmer et al,2008)Several studies show that children and adults who drink soda or other sugar-sweetened beverages are more likely to gain weight than those who don't, (Ludwig et al 2001, Vartanian et al, 2007,) and that switching from these to water or unsweetened beverages can reduce weight.(Ebbeling et al 2006) Even so, however, weight gain caused by sugary drinks may not completely explain the increased

diabetes risk. There is mounting evidence that sugary drinks contribute to chronic inflammation, high triglycerides, decreased "good" (HDL) cholesterol, and increased insulin resistance, all of which are risk factors for diabetes. (Malik et al,2010)

CHOOSE GOOD FATS INSTEAD OF BAD FATS

The types of fats in your diet can also affect the development of diabetes. Good fats, such as the polyunsaturated fats found in liquid vegetable oils, nuts, and seeds can help ward off type 2 diabetes.(Riserus et al 2009) Trans fats do just the opposite.(Hu et al 2001, Riserus,2009) These bad fats are found in much margarine, packaged baked goods, fried foods in most fast-food restaurants, and any product that lists "partially hydrogenated vegetable oil" on the label. Eating polyunsaturated fats from fish—also known as "long chain omega 3" or "marine omega 3" fats—does not protect against diabetes, even though there is much evidence that these marine omega 3 fats help prevent heart disease (Kaushik et al,2009).If you already have diabetes, eating fish can help protect you against a heart attack or dying from heart disease.(Hu et al,2003)

LIMIT RED MEAT AND AVOID PROCESSED MEAT

People who regularly eat red meat have roughly a 20 percent greater risk of type 2 diabetes than people who rarely or never eat red meat.(Aune et al,2009) It may be that the high iron content of red meat diminishes insulin's effectiveness or damages the cells that produce insulin. Eating lots of processed meat can also increase your diabetes risk. (Aune et al,2009) Red and processed meats are a hallmark of the unhealthful "Western" dietary pattern, which seems to trigger diabetes in people who are already at genetic risk.(Qi et al,2009) So skip the steak, bologna, and ham. Nuts, seeds, beans, tofu, or poultry are much more healthful protein choices.

IF YOU SMOKE, TRY TO QUIT

Add type 2 diabetes to the long list of health problems linked with smoking. Smokers are roughly 50 percent more likely to develop diabetes than nonsmokers, and heavy smokers have an even higher risk.(Willi et al, 2007)

ALCOHOL NOW AND THEN MAY HELP

A growing body of evidence links moderate alcohol consumption with reduced risk of heart disease. The same may be true for type 2 diabetes. Moderate amounts of alcohol—up to a drink a day for women, up to two drinks a day for men—increases the efficiency of insulin at getting glucose inside cells. And some studies indicate that moderate alcohol consumption decreases the risk of type 2 diabetes.(Hu et al, 2001, Djousse et al,2007, Joosten et al, 2010; Nazni and Ramya, 2012) If you already drink alcohol, the key is to keep your consumption in the moderate range, as higher amounts of alcohol could increase diabetes risk.(Baliunas et al, 2009) If you don't drink alcohol, there's no need to start—you can get the

same benefits by losing weight, exercising more, and changing your eating patterns.

THE BOTTOM LINE: PREVENTING TYPE 2 DIABETES

The key to preventing type 2 diabetes can be boiled down to five words: Stay lean and stay active.

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