

Diabetes and You: Why Body Shape Matters

It's common knowledge that obesity is a key risk factor for the development of type 2 diabetes. But there are other, perhaps less-well-known risk factors that can help identify people at risk for developing diabetes. Among them: not only the size of your body, but where that extra weight is stored. In addition to heart disease, people who carry their weight around the middle are particularly at risk of developing diabetes.

There are three basic body types defined by distribution of body fat. These are android (apple shape), intermediate and gynoid (pear shape). Apple-shaped bodies have larger waists with a lot of weight around the abdomen. Pear-shaped bodies carry more weight around the hips and have thinner waists. However, the concern here is far deeper than just physical appearance. The important distinction is that people whose fat collects on their abdomen (central obesity), making them resemble an apple, are at a greater risk for type 2 diabetes. On the other hand, fat in the hips and legs (as seen in pear-shaped bodies) is linked to healthier metabolic profiles. So body shape becomes an important factor in determining whether a person is more or less likely to develop diabetes.

What influences body shape?

Although central obesity is a feature of certain endocrine diseases such as Cushing's syndrome, in the majority of people it is due to the imbalance between amount of food eaten and calories burned. Excessive alcohol consumption and screen time (time spent on sedentary activities such as the Internet, video games and television) can also lead to central obesity. And aging makes matters worse. With increasing age, the rate at which the body burns calories slows down, making it even harder to maintain a healthy weight. Post-menopausal women tend to gain more belly fat, likely due to decreasing estrogen, which appears to influence fat distribution. And in some cases, genetics can also play a role in the amount of fat that is stored and where it is stored.

How does central obesity contribute to diabetes mellitus?

Following food intake and digestion, blood sugar levels rise. In response to this rise in blood sugar, the body produces insulin to help the body utilize sugar for energy and keep blood sugar levels within normal range. Scientific studies have shown central obesity to be associated with insulin resistance, a state in which body cells fail to respond to insulin effectively. This results in high blood sugar levels and diabetes mellitus. In addition, central obesity also increases risk of cardiovascular disease, colorectal cancer, sleep apnea and high blood pressure.

Is body mass index alone a good predictor of diabetes?

For a long time, body mass index (BMI) – calculated by dividing a person's weight in kilograms by the square of the person's height in meters – has been used as a measure to define obesity (a BMI of 30 or higher is considered obese, signified as $BMI > 30 \text{ kg/m}^2$). However, there are two concerns about BMI. First, it does not differentiate between fat mass and lean (muscle) mass, which means a person in great physical condition may have a higher BMI due to increased muscularity rather than increased fatness. Second, BMI does not take into account the

distribution of body fat. Therefore, validity of BMI alone as a predictor of diabetes mellitus is now being questioned.

Waist circumference and waist-to-hip ratio may be better predictors than BMI. Central obesity is assessed in a doctor's office by measuring a person's waist-to-hip circumference ratio (WHR). Waist circumference is measured at the highest point of the iliac crest, the thick curved upper border of the ilium, the most prominent bone on the pelvis. Hip circumference is measured at the greatest circumference of the buttocks. Central obesity is defined by waist-to-hip circumference ratio greater than 0.90 for men and 0.85 for women.

In a recent study researchers found that persons with normal BMI but with central obesity (high WHR) had the worst long-term survival compared to those with similar BMI but no central obesity. These findings have significant clinical implications. During routine health maintenance visits, WHR ratio is usually not assessed. Therefore, a person with normal BMI and central obesity might not get screened for DM.

It is best to use BMI and WHR in conjunction, rather than either method alone. A person with BMI > 30 kg/m² is certainly at risk for obesity-related health concerns. However, a pear-shaped body should prompt discussion about improving lifestyle in general, rather than focused on risk of DM and heart diseases.

How can central obesity be reduced?

Restoring the balance between calorie intake and energy expenditure is key to diminishing central obesity. In fact, often, expending more energy than one is taking in as food is necessary to kick-start the process of restoring a healthy weight. A food diary (either a book or a mobile app) can be helpful in this circumstance. Keeping track of what you eat and drink, how much you move and daily screen time can help you and your doctor design a meal and physical activity plan that works best for you to reduce central obesity and your risk for developing DM.

Physical activity can be helpful as well. According to the HHS Physical Activity Guidelines for Americans, adults need at least 150 minutes of moderate-intensity aerobic activity every week and muscle-strengthening activities two or more days a week. Physical activity can be spread out over the week, with as little as 10 minutes at a time being considered beneficial. Brisk walking, pushing a lawn mower, dancing and biking count as aerobic or cardio exercises. Muscle-strengthening activities include lifting weights, resistance exercises, push-ups, sit-ups and heavy gardening.

Spot exercise targeted towards a specific muscle or location of the body can be beneficial. However, the common myth that toning abdominal muscles with crunches or push-ups gets rid of central obesity is not true. While these exercises might certainly strengthen the abdominal muscles and help them hold belly fat in, they do little for decreasing the belly fat itself. Muscle-strengthening activities should focus on all major muscle groups including the legs, hips, back, chest, abdomen, shoulders and arms.

And along with its many mind-body benefits, yoga has been shown to be beneficial in prevention and management of diabetes mellitus.

In present times, the expression “prevention is better than cure” holds true in the context of diabetes and heart diseases, more than for anything else. These lifestyle diseases contribute significantly to health care burden and require massive preventive measures. Since body shape is predetermined to a degree, adopting a healthier, more active lifestyle is the key.

Dr Shahjada Selim

Assistant Professor

Department of Endocrinology

Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Cell: +880 1919000022

Chamber

Comfort Doctors' Chamber

165-166 Green Road, Dhaka Mobile:

01731956033, 01552468377, **01826200665**

Email: selimshahjada@gmail.com, info@selimshahjada.com