Internal Medicine of Griffin

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Education

Diabetes and Exercise: Preventing Low Blood Sugar

You may become frustrated with the ups and downs of blood sugar levels when you exercise. But it is important to remember that you need to put up with the changes in blood sugar levels in return for a healthier heart and blood vessels. You can avoid problems by keeping good exercise records and being prepared.

How does exercise affect my blood sugar level?

Exercise usually helps lower your blood sugar. This is because insulin is more effective during exercise. Regular exercise increases the number of insulin receptors on your cells. The receptors are the places where insulin attaches to cells so sugar can pass into the cells. Having more receptors makes the body more sensitive to insulin. As a result, insulin works more efficiently. This means you will probably need a lower daily dose of insulin. Exercising can be a good way to lower a high blood sugar (as long as ketones are not present).

Sometimes blood sugars go up with exercise. This may happen because you are excited and are releasing a hormone called adrenaline. This is a normal response in people with or without diabetes. The adrenaline causes sugar to be released from stores in the muscle and liver and raises the blood sugar for awhile. This usually happens in the first hour of exercise.

How can I prevent low blood sugar (hypoglycemic) reactions during exercise?

Check your blood sugar before, during, and after the exercise.

The best way to know how exercise affects your blood sugar is to do a blood sugar test before, during (when possible), and after the exercise. Keeping good records of your exercise and the results of these tests is important. When you do a similar exercise at a similar time of the day (with your usual insulin dose) and with a similar starting blood sugar level, it will allow you to know how to adjust your insulin and snacks.

Eat before heavy exercise.

If you are going to exercise around mealtime, you should eat the meal first. When it is possible to choose the exercise time, try to begin the exercise 30 to 60 minutes after a meal or snack.

- Liquids are absorbed most rapidly and generally prevent low blood sugar reactions for just the next 30 to 60 minutes.
- Solid foods, such as those eaten at mealtime, are digested more slowly and usually keep the blood sugar level up for at least 2 to 3 hours.

Have extra snacks available during exercise.

You should always have a source of sugar available.

- You can sew pockets in basketball shorts, jogging pants, and other clothes to hold a sugar packet, sugar cube, or a glucose tablet for an emergency. Joggers' wallets on athletic shoes work nicely.
- A sandwich or similar snack should be available nearby, as the effects of a sugar packet may last only a few minutes.

It is often difficult to guess the amount of a snack necessary for a particular activity. If you exercise within an hour after a meal, you may not need an extra snack. If you are not physically fit, your blood sugar may drop more rapidly than if you are physically fit. It is very useful to monitor your blood sugar to figure out what the correct snack is for you. If your blood sugar is low (for example, below 100 mg/dL or 5.5 mmol/L), you need a larger snack than when your blood sugar is high. The type of snack can vary depending on the expected length of the activity.

- Snacks such as milk or juice are used for short-term (30 to 60 minutes) activities because they contain carbohydrates that are quickly absorbed. Milk is better than juice because it has protein. Add more food, such as crackers or bread if the activity is to last longer.
- Snacks that include protein and fat along with carbohydrate are good for long-term activities. This might be a cheese or meat sandwich with a glass of juice.

Extra water is also important, particularly during hot weather. A general rule is to drink 8 ounces of fluid for every 30 minutes of vigorous activity. Liquids such as milk and fruit juices help replace water, salts, and carbohydrates.

Change the insulin dose.

Before trying an activity for the first time, discuss any changes that might be needed in insulin dosage with your health care provider.

Change the injection site.

Where you inject the insulin can affect how quickly the insulin is absorbed. Exercise increases blood flow into the part of the body that is moving. The increased blood flow causes a faster absorption of insulin.

- If you inject insulin into an arm or leg that you will be using heavily during exercise, your body may absorb the insulin too fast. For example, if you are going to run, don't inject insulin into your leg. If you are going to play tennis, avoid injecting into your tennis arm.
- The abdomen is usually a good injection site before strenuous exercise.

Make sure others know.

Wear a medical alert bracelet or necklace. If you are on a team, it is important for your teammates to know about your diabetes. Make sure one of your teammates knows where your extra sugar snacks are kept. Remember that when you have a low blood sugar level during a sporting event, it is important for you to rest at least 10 minutes after eating some sugar to let your blood sugar rise.

What is delayed hypoglycemia?

Delayed hypoglycemia means you have low blood sugar several hours after the exercise is over. It may occur 3 to 4 hours or up to 12 hours after exercise. This can sometimes cause an insulin reaction in the middle of the night. It may happen because extra sugar in the blood goes back into storage in the muscle. Hormone changes with sleep (for example, lower adrenaline levels) may also cause the delayed reaction. It is best prevented by:

- eating extra carbohydrate at the next meal or snack after exercise
- eating a longer-lasting snack (including solid carbohydrate, protein, and fat) at bedtime
- reducing the insulin dose.

If you have this problem, you should discuss it with your health care provider.