Purpose

In diagnosing diabetes mellitus, several tests are used to determine as precisely as possible what metabolic error is causing the disease. Such tests are urinary glucose level, urinary ketone bodies, fasting blood glucose level, insulin sensitivity, and glucose tolerance tests. In this laboratory, we will be using the glucose tolerance test.

Procedures

1. Six student volunteers will be selected for this experiment. These subjects should report to the lab in the fasted state – not having eaten for 10-12 hours.
2. Each student's normal fasting blood glucose level will be determined using the test strips for the glucometer assigned to each student. Each volunteer will clean a finger with 70% alcohol, then use a sterile lancet to obtain a drop of blood for the test. **If a student is helping another obtain a blood sample, gloves and universal precautions will be followed.
3. Each subject will then drink a lemon-flavored solution (Tru-Glu) of 25% glucose. The quantity of solution will be based on 1 g of glucose per kilogram of body weight. To determine body weight in kilograms, the weight in pounds will be divided by 2.2.
4. After ingesting the glucose, the subject will repeat the blood testing procedures every 30 minutes. Testing will continue in this manner for 1 1/2 hours or until the end of the lab period.
5. Record and graph the average of the class results of the blood glucose tests.
6. Compare the results with the normal glucose tolerance test curve. Describe the graphs in terms of absorptive and post-absorptive states.

8-B: Insulin shock (information only)

An excess blood level of insulin causes a state of extreme nervousness and convulsions that is referred to as insulin shock. Insulin shock is caused by a low level of blood glucose (hypoglycemia), produced when insulin stimulates the entry of glucose into the body cells. The brain cells depend almost totally upon glucose for their energy, and when the blood glucose falls to a low level (50-70 mg%), the neurons become hyperexcitable and extreme nervousness develops. If the blood glucose level is lowered still further (30-50 mg%), clonic (spastic, irregular) convulsions may develop and eventually coma and death may result.

Results
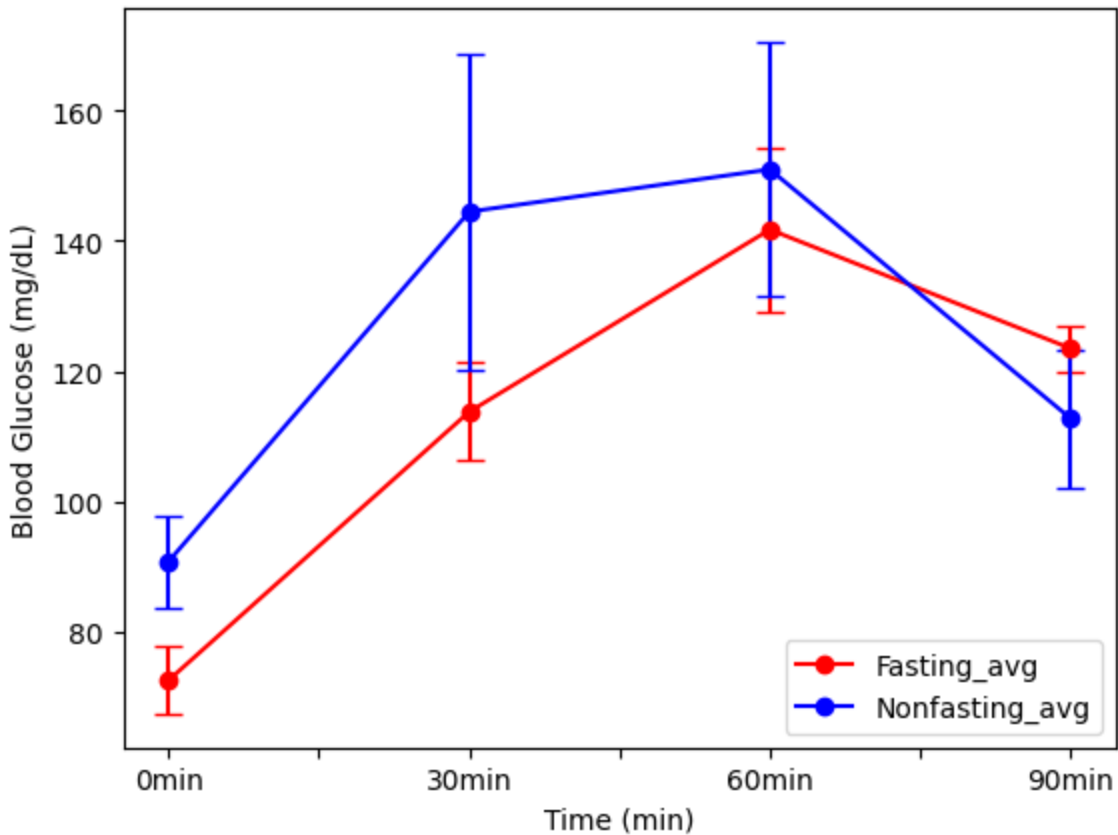
Discussion

Students who fasted for 10+ hours started at a blood glucose level of lower than 80 mg/dL after 30 minutes their blood glucose rose over 30 mg/dL. The highest level of glucose rise happened after 1 hour of taking the glucose drink. After the hour, blood glucose started dropping.

Conclusion

The blood glucose for the students that fasted all day was significantly lower than the students who ate during the day.