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Human Physiology

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Lab #8-Hormonal Activity: The Glucose Tolerance Test

Purpose

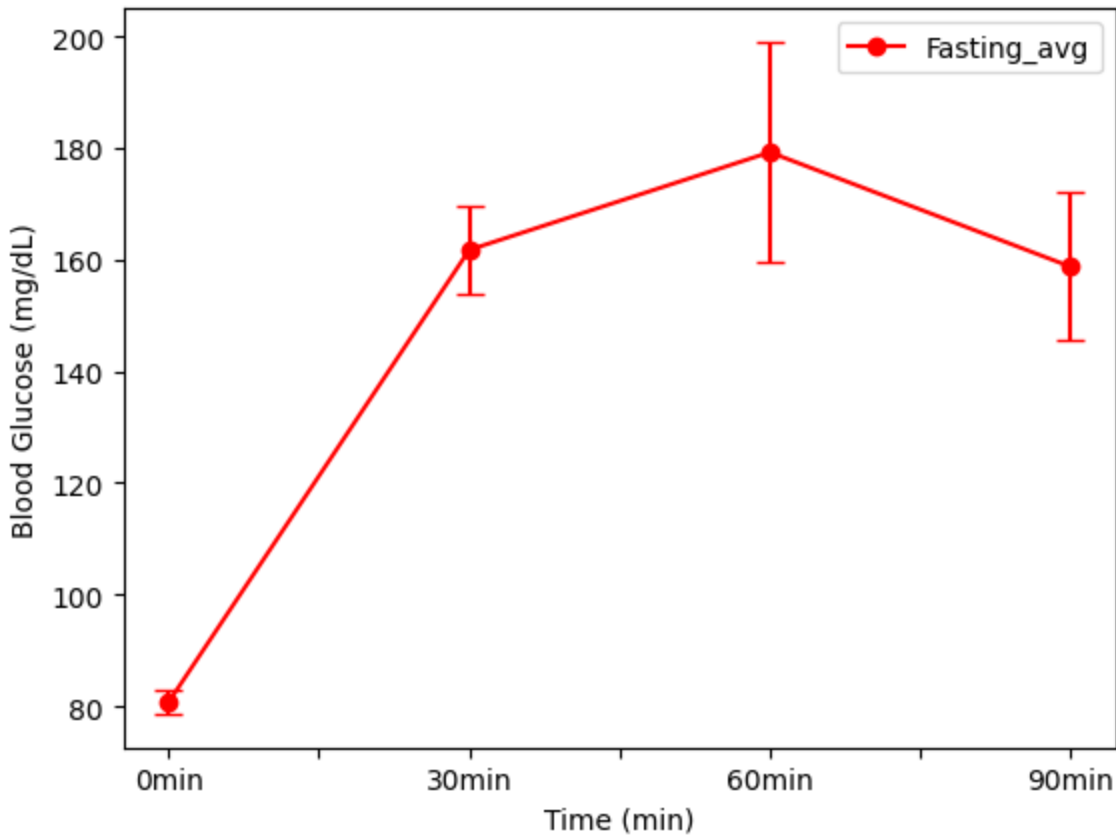
The purpose of this lab is to observe the changes in the level of glucose in the blood following its injection. To determine normal fasting blood glucose levels and how they are affected after ingesting a solution of 25% glucose and to see if the blood glucose levels drop or rise over a period of 90 minutes. This experiment will also show the body's ability (specifically the pancreas) to respond to the ingestion of excess glucose.

Procedures

1. Six student volunteers will be selected for this experiment. These subjects should report to the lab in the fastest state—**not having eaten for 10-12 hours**.
2. Each student's normal fasting blood glucose level will be determined using the teststrips 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 postabsorptive states.

Results

<u>Groups</u>	<u>Fasting 1</u>	<u>Fasting 2</u>	<u>Fasting 3</u>	<u>Fasting 4</u>	<u>Fasting 5</u>	<u>Fasting 6</u>	<u>Fasting 7</u>	<u>FastingA VRG</u>	<u>Fasting SEM</u>
<u>0min</u>	75	77	85	86	103	81	83	80.75	2.101587
<u>30min</u>	140	159	158	190	141	131	161	161.75	7.845988
<u>60min</u>	154	135	174	254	171	152	180	179.25	19.773419
<u>90min</u>	151	141	133	210	170	185	191	158.75	13.210295



Discussion

The results show a trend of mainly rising then dropping. In the first 30 minutes we can see the blood glucose level start to rise from the ingestion of the solution, after around 60 minutes we can see a sort of peak in the blood glucose level for most of the people who are fasting. After the 60 minute mark we can see a clear descent in the blood glucose level. I believe that after the 60 minute mark we see a descent because the body has now released insulin from the pancreas in order to return the blood glucose levels down to a normal state. Beta cells, located in the pancreas, make and release insulin after 60 minutes which cause the blood glucose levels to drop. We can also see that in the beginning (despite fasting) all the blood glucose levels were still around normal values (around 70-100 mg/dL), this is because the alpha cells in the pancreas were releasing glucagon in order to maintain normal blood glucose levels.

Conclusion

We can see that the body takes around 60 minutes to begin to respond to a spike of glucose in the blood, after 60 minutes the body responds by releasing insulin for the pancreas using beta cells.

After insulin is released it can be observed that blood glucose levels will begin to drop back to normal levels.