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Laboratory 8 – Hormonal Activity: The Glucose Tolerance Test

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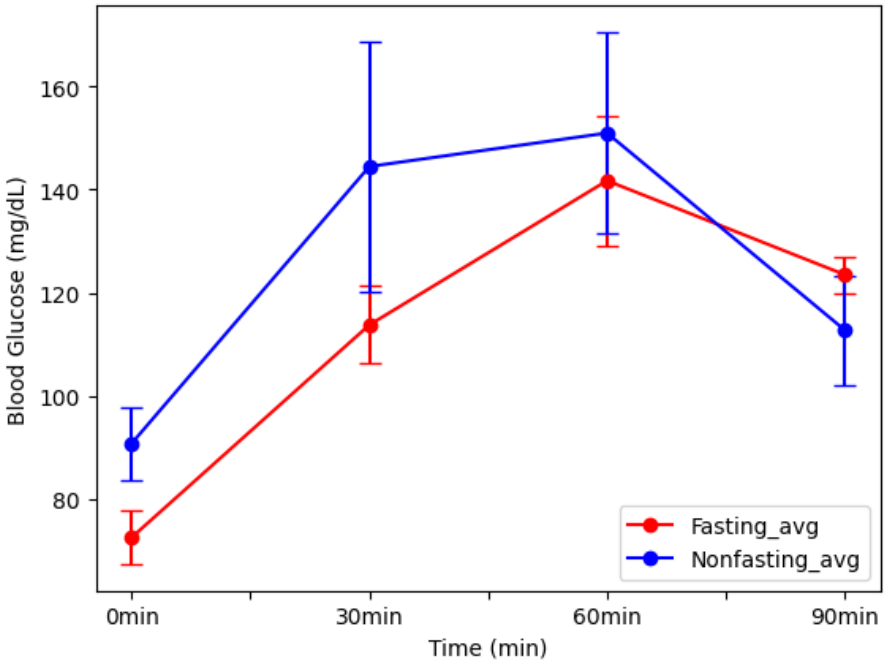
Purpose – Insulin is an endocrine hormone secreted by the beta cells of the islets of Langerhans in the pancreas. Its principal function is to assist the transport of glucose across the cellular membrane. When insulin is deficient or lacking only a small amount of glucose across the cell membrane and be used in cellular metabolism. This low rate of transports results in excess accumulation of glucose in the blood called hyperglycemia. An excess of insulin causes a decrease in the level of blood glucose or hypoglycemia. The normal concentration for blood glucose is 90 mg% (90mg/ 100 ml of blood) but it may range from 60 mg% to 140 mg% depending upon the individual's dietary intake of glucose. The purpose of laboratory 8 is the glucose tolerance test assays the ability of the body (especially the pancreas) to respond to an excess ingestion of glucose. The changes in blood glucose level following glucose ingestion (1 g/kg body weight) are markedly different between the normal and the diabetic person.

Procedure – In laboratory 8, glucose tolerance test helped us understand the basic mechanism of hormonal activity and the second messenger theory of some hormones. We understood the absorptive and post-absorptive states, the role of insulin and glucagon in the regulation of blood glucose and understood the terms of hyperglycemia and hypoglycemia. In experiment 8-A: glucose tolerance test, 8 students volunteered for this experiment. Out of the 8 students, 4 of them were in a fasting state (not having eaten for 10-12 hours) and the other 4 were not in a fasting state. The students in a fasting state blood glucose level will be determined using the test strips for the glucometer assigned to each student. The students not in a fasting state did the same thing, test their blood on a testing strip for the glucometer. Each volunteer will clean a finger with 70% alcohol, then use a sterile lancet to obtain a drop of blood for the test. Another student is also more than welcome to help another student obtain a blood sample, gloves and universal precautions will be followed. Each student 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. After ingesting the glucose, the subject will repeat the blood testing procedures every 30 minutes. Testing will continue in this manner for 90 minutes or until the lab period ends. Record and graph the average of the class results of the blood glucose test. Compare the results with the fasting and non-fasting test curve.

Results –

8-A: Glucose tolerance test



group	**Fasting1**	**Fasting2**	**Fasting3**	**Fasting4**	**Non-fasting5**	**Non-fasting6**	**Non-fasting7**	**Non-fasting8**
0min	72	59	75	84	86	101	103	73
30min	95	113	132	115	203	159	127	89
60min	115	136	176	140	208	122	129	145
90min	118	118	133	125	82	119	119	131

Discussion – In laboratory 8 there was one experiment done that was very interesting. The students who participated had to drink the glucose drink (chug it) ¾ of the way down which was not good at all. That glucose drink is supposed to make your glucose go up which did make mine go up dramatically but then it slowly started going back down. I think the highest mine went up to was 140-170 and then it dropped down to 80ish. Poking our fingers with the lancet was not fun at all, it didn't hurt just the thought of poking your finger 4 different times was not fun. This lab did take a few hours to complete but it was in our favor because we got to catch up on a lot of

our labs. It is crazy to think how one drink can make your glucose change or at least any food as well. Once drinking that sugary lemon drink, your glucose spikes up a lot. This experiment could have gone wrong if you didn't insert enough blood in for the test. If there was not enough blood for the glucose reading machine it gave you a very low number which was not accurate at all. I really enjoyed doing this lab even though we had to be poking our fingers, it was worth it. I got to see my own glucose levels rise and go down and plus we got extra credit for it.

Conclusion – All in all, the purpose of laboratory 8 is the glucose tolerance test assays the ability of the body (especially the pancreas) to respond to an excess ingestion of glucose. The changes in blood glucose level following glucose ingestion (1 g/kg body weight) are markedly different between the normal and the diabetic person. Insulin is an endocrine hormone secreted by the beta cells of the islets of Langerhans in the pancreas. Its principal function is to assist the transport of glucose across the cellular membrane. When insulin is deficient or lacking only a small amount of glucose across the cell membrane and be used in cellular metabolism. Laboratory 8 was a very different but fun experience, and would do it all over again.