

Blood glucose regulation lab essay sample



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1. When was plasma insulin concentration highest? If values are similar for several time points, then give range of times when plasma insulin concentration was highest. Plasma insulin concentration was at its highest during the 1 hour post meal time exceeding a concentration of 180. 2. When was plasma insulin concentration lowest? If values are similar for several time points, then give range of times when plasma insulin concentration was lowest.

Plasma insulin concentration was at its lowest during the fasting time period. Concentration was about 68 during that time. 3. When was plasma glucagon concentration highest? If values are similar for several time points, then give range of times when plasma glucagon concentration was highest.

Plasma glucagon concentration was at its highest during the 1 hour post meal time, at a concentration of 6. 4. When was plasma glucagon concentration lowest? If values are similar for several time points, then give range of times when plasma glucagon concentration was lowest.

Plasma glucagon concentration was at its lowest during the fasting time period, at a concentration between about 1.6 -1.8. 5. When was plasma insulin/glucagon concentration highest? If values are similar for several time points, then give range of times when plasma insulin/glucagon concentration was highest.

Plasma insulin/glucagon concentration differed significantly. Insulin levels were at their highest during 1 hour post meal time exceeding 180 while glucagon was at its highest during the 2 hour at 36.

6. When was plasma insulin/glucagon concentration lowest? If values are similar for several time points, then give range of times when plasma insulin/glucagon concentration was lowest.

Plasma insulin/glucagon concentration differed significantly. Insulin levels were at their lowest during the fasting time period at about 68 while glucagon was at its lowest during the 1 hour at 35.

Discussion

1. Explain how insulin changed plasma glucose concentration over the course of the experiment. Insulin increases the transport of glucose into body cells causing blood glucose levels to decrease. When the insulin calmed down a bit and decreased that when a rise in glucose was presented.

2. Explain how glucagon changed plasma glucose concentration over the course of the experiment. Glucagon caused blood glucose to increase. Laboratory Report/ Jazmine Ricine Parham/ Blood Glucose Regulation/ Professor Deno/ 12. 03. 2014/ Page [3] of [4]

3. Explain what caused the change in plasma ketone concentration over the course of the experiment. The break down of fatty acids is what forms ketones so the intake of the meal that was filled with carbs is what caused the change in plasma ketone concentration over the course of the experiment.

4. Explain how negative feedback caused the changes in plasma insulin concentration observed during the experiment. Well secretion of hormones are often time referred to as negative feedback. In the cause of insulin you need blood glucose to secrete it so thats were the negative feedback comes

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in one needs the other. Carbs led to glucose and glucose secretion leads to insulin production. 5. Explain how negative feedback caused the changes in plasma glucagon concentration observed during the experiment.

Secretion of hormones are often referred to as negative feedback. In the case of glucagon high blood glucose stimulates the secretion of insulin by the pancreas and that in turn causes the secretion of glucagon which is where negative feedback comes in; one needs the other to function. Carbs cause glucose production, glucose leads to insulin, and that insulin secretes glucagon. 6. The insulin/glucagon ratio changed over the course of the experiment indicating changes in glucose storage and changes in ability to increase blood glucose concentration via glycogenolysis and gluconeogenesis. State when glucose storage capability was highest and why.

Glucose storage capability was at its highest during the 1 hour post meal time because the carbs that were ingested during the meal caused blood glucose levels to rise. 7. State when glycogenolysis and gluconeogenesis were highest and why. Glycogenolysis is the conversion of glycogen to glucose, low blood glucose stimulates the production and secretion of glucagon so glycogenolysis was at its highest at time periods where blood glucose were low and that was around the fasting - 0 hour post meal time. Gluconeogenesis is the conversion of glucose from a non carb so Im assuming that this to was at its highest before eating. 8. Explain how a high blood ketone level helps the body conserve blood glucose. Ketones are transported into cells and then are used to create ATR. The use of that ATR

then creates ATP that conserves blood glucose, thereby helping to maintain normal blood glucose levels.

9. Restate your predictions that were correct and give the data from your experiment that supports them. Restate your predictions that were not correct and correct them, giving the data from your experiment that supports the correction. I predicted correctly that plasma glucose would be higher immediately after the meal. I also predicted correctly that plasma glucagon levels would be highest while fasting. The concentration levels in the chart supports my correct predictions. However I incorrectly predicted that plasma ketone was highest 1-3 hours after the meal it is actually higher while fasting to immediately after the meal. I predicted plasma insulin would be highest immediately after the meal when it is 1-3 after.

Application

1. During exercise, epinephrine and norepinephrine are released from the adrenal medulla. Epinephrine and norepinephrine have the same effect on plasma glucose levels as glucagon. Explain how epinephrine and norepinephrine affect plasma glucose and why this is important during exercise.

Epinephrine stimulates the breakdown of glycogen and glucose in the liver which then raises the level of blood sugar. The glucose secreted then is used by the body in times of stress or times when we need the extra energy or focus such as when exercising. Norepinephrine is essentially the same thing however this is administered unlike epinephrine that is natural. 2. The symptoms of diabetes mellitus include high plasma glucose levels and

ketoacidosis (blood pH decreases due to increasing levels of ketones).

Explain how diabetes causes these symptoms. Diabetes mellitus is a condition where either you cant produce enough insulin, your body cant use the insulin that was produced, or lastly it is a combination of both all of these things play a factor in glucose and ketone levels.

References:

Laboratory Report/ Jazmine Ricine Parham/ Blood Glucose Regulation/
Professor Deno/ 12. 03. 2014/ Page [4] of [4]