



How does hair growth change with blood glucose level?

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Abstract

The objective of study was to define the relationship between blood glucose and hair growth. Total subjects who joined this study were 150. Blood glucose level is the concentration of glucose in our body. Glucose is simply a sugar. In normal conditions, 4g glucose must be present in 7kg blood of a human. This amount is measured in mili mole per liter. A hormone called insulin regulates the overall glucose level. When the glucose level increases, insulin is released. It breaks the glucose and lowers its level. If blood glucose level is not maintained at normal concentration then it results in abnormalities. The high glucose level is called hyperglycemia and low glucose level is called hypoglycemia. Diabetes mellitus is a condition of hyperglycemia and it is common in 2 to 5% population. It is very important to maintain the blood glucose within narrow ranges. Normal blood glucose level prevent many abnormalities. This level can be adjusted by taking the proper food and dosage of insulin. Exercise also plays an important role. Hair growth is completed in 3 steps. First is ANAGEN phase. New hair stands are produced in thi phase. Growth rate of hair is normal that is ½ inch in a month. Second is CANAGEN phase. It comes after anagen phase and causes end of growth phase. Last is TELOGEN phase. It is also called resting phase. In this phase, the completely grown hair stands are shed. With help of a needle, a blood drop was taken from patient's body before breakfast. This blood drop was placed test strip. Readings were carefully taken from meter which displayed the blood glucose level of patient. It was concluded from results that hair growth does not change with glucose level.

Keywords: Diabetes, hyperglycemia, hypoglycemia, insulin

Introduction

Blood glucose level is the concentration of glucose in our body. Glucose is simply a sugar. In normal conditions, 4g glucose must be present in 7kg blood of a human. This amount is measured in mili mole per liter. A process called metabolic homeostasis regulates the level of glucose in our body. The form in which glucose is stored in cells of liver or muscles is glycogen. When someone is fasting, the blood glucose is maintained by the glycogen consumption. Glucose provides us a source of energy that is needed for everyday functions. Brain normally consumes 60% of glucose. The glucose is circulated throughout the body by blood circulation. A hormone called insulin

regulates the overall glucose level. When the glucose level increases, insulin is released. It breaks the glucose and lowers its level. In the morning, before taking meal, the blood glucose level is low. But it increases after taking meal. Normal blood glucose level is 70-130 mili mole/liter. Blood glucose should be measured during fasting,before exercise, after lunch and 2-3 hours after lunch. If blood glucose level is not maintained at normal concentration then it results in abnormalities. The high glucose level is called hyperglycemia and low glucose levelis called hypoglycemia. Diabetes mellitus is a condition of hyperglycemia and it is common in 2 to 5%

population. There are two types of diabetes. In type I, the insulin producing cells are attacked. That is why insulin is not release which results in increased glucose level. In type II, patients do not respond to insulin and insulin I not produced. Different drugs are used to increase or decrease the glucose level. It is very important to maintain the blood glucose within narrow ranges. Normal blood glucose level prevent many abnormalities. This level can be adjusted by taking the proper food and dosage of insulin. Exercise also plays an important role.

Hair growth is completed in 3 steps. First is ANAGEN phase. New hair stands are produced in this phase. Growth rate of hair is normal that is $\frac{1}{2}$ inch in a month. 90 percent of total hair remain in this phase. These remain in this phase for 2-3 years. Second is CANAGEN phase. It comes after anagen phase and causes end of growth phase. The contraction and detachment of follicles occur. 1 percent of total hair remain in this phase. These remain in this phase for 1-2 weeks. Last is TELOGEN phase. It is also called resting phase. In this phase, the completely grown hair stands are shed. After this, anagen phase is started again and new hair strands begin to form. 10 percent of total hair remain in this phase these remain in this phase for 3-6 months. This cycle repeated with average of 4-5 years.

Materials and Methods

Total subjects who participated in this study were 150. These subjects were students of Bahauddin Zakariya University Multan.

Table 1; How does hair growth change with glucose level?

Gender	Fast hair growth	Slow hair growth	p Value
Men	81.23 ± 5.83	95.5 ± 3.87	0.05
Women	92.74 ± 9.25	91.72 ± 7.84	0.20
Total	92.36 ± 8.51	92.24 ± 7.49	1.88

* $p < 0.05$ (where p value for male subjects is 0.05, for female subjects is 0.20 and for overall subjects is 1.88)

Table 1 showed that the male subjects with average blood glucose level of 81.23 ± 5.83 had fast hair growth and with average blood glucose level of 95.5 ± 3.87 had slow hair growth. The p value was 0.05 which showed that data is non-significant and hair growth cannot be changed with glucose level. The female subjects with average blood glucose level of 92.74 ± 9.25 had fast hair growth and with average blood glucose level of 91.72 ± 7.84 had slow hair

Glucose level measuring method:

A chemically sterilized test strip was taken. With help of a needle, a blood drop was taken from patient's body before breakfast. This blood drop was placed test strip. A meter was used to detect the reaction between blood drop and test strip. The numbers were displayed on meter with unit mg per dL or mili mole per liter. Readings were carefully taken from meter which displayed the blood glucose level of patient.

Project designing:

A questionnaire was prepared to evaluate that how blood glucose level can be related with hair growth.

Statistical analysis

Statistical analysis for the study were performed by using MATLAB statistical software, MS excel and also the t-Test to interpret the results. P value has to be less than 0.005.

Results

How does glucose level (Mean $\pm$ SD) can be changed with hair growth is given in Table 1.

growth. The p value was 0.60 which showed that data is non-significant and hair growth cannot be changed with glucose level. The total subjects with average blood glucose level of 92.36 ± 8.51 had fast hair growth and with average blood glucose level of 92.24 ± 7.49 had slow hair growth. The p value was 1.88 which showed that data is non-significant and hair growth cannot be changed with glucose level.

Discussion

This study was based on a questionnaire that was to define the relationship between blood pressure and hair growth (1-8). Sugar levels effect the health of hair follicles. Dr. Raman K. Madan explained high glucose levels effect the blood vessels which in turn damage hair follicles because the supply of oxygen and nutrients is decreased. These damaged vessels result in hair loss and slow hair growth (9). High glucose level results in diabetes. Due to diabetes, emotional and physical stress is caused. It limits the growth cycle of hair and results in hair loss. The relation between hair growth and glucose level is reversible (10). In 2000, studies were performed in Turkey, Taiwan and Mexico which showed that consuming sugar can result in hair loss. In men, this hair loss starts at hairline. While in women, diabetes results in total thinning of hair (11).

Conclusion

It was concluded from results that hair growth does not change with glucose level.

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