

## The effect of honey on the blood and urine glucose levels of wistar rats

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### ABSTRACT

The diabetogenic activity of honey was evaluated in a group of 40 wistar rats divided into experimental and normal control groups of 10 rats each. Experimental groups of male and female rats were administered with hone of 100g/kg of body weight through feed for 4 weeks while control groups were given normal rat chivo. Data was analysed using the student's t-test statistics. Fasting blood glucose and body weight were statistically significantly higher in experimental groups there was no glucose detected in urine of control and experimental group. This work suggest that: continuous ingestion of honey could lead to the establishment of type II DM and as such care must be exercised in substituting it for refined sugar.

**Key words:** Honey, Glucose levels, Wistar rats.

### INTRODUCTION

Honey is fast becoming a food item in most times in Nigeria especially with increase knowledge of its superior nutritional advantage over processed sugar. According to rational honey board (2003). Honey is a sweet and viscous fluid produced by honey bees from the nectar of flowers. It is a pure product that does not allow for the addition of any other substances. Humans have been consuming honey which contains about 60% of fructose for hundreds of years without considering its health significance. What is disturbing is that most individual now take honey as a substitute to refined sugar as a way of controlling or preventing diabetes milletus. Yet the incidence and prevalence of DM is on the increase.

Although there is a little evidence that modest amount of honey have detrimental effect

on carbohydrate and lipid metabolism, larger doses have been associated with numerous metabolic abnormalities in laboratory animal and humans suggesting that high consumption of honey adversely affect health (Halltis, 1990; Henry *et al*, 1991).

Blood glucose is mostly regulated because of its importance in the Brain, retina, germinal epithelium of ganads and Red blood cells. Thus there is need for maintenance of Blood glucose at a particular set point of about 100mg%, as higher or lower values with exposed the individual to health problems.

The insight that consumption of honey may have effects on the metabolism of lipids and carbohydrates calls for propare investigation into the diabetogernic effect of honey in order to appropriately advice on its consumption. This work

aims to find out the effect of chronic honey consumption on the fasting blood glucose level and the urine glucose level of wistar rats.

## METHOD

### Materials

Honey was purchased in the local market in Abraka Delta State, Nigeria

Twenty wistar rats, 10 males and 10 females weighing an average of 121g were divided into 4 groups two male groups MC and ME, and two female groups FC and FE. MC and FC were control groups and were fed normal rat chow and water adlibitum. ME and FE were experimental groups and were given 100g/kg body weight of honey feed and water adlibitum for 5 weeks.

### Procedure

Animal were weighed before commencement of experiment and weighed subsequently every week until the end of experiment.

At the end of administration, blood samples were collected via cardiac puncture under chloroform anesthesia after an over night test about 5 mls of blood were collected into container containing sodium oxalate, samples were centrifuged and serum obtained was assayed.

Fasting blood glucose level was determined through the enzymatic colorimetric method by Trinder P.A. (1966).

Statistics – Student's t-test and Anova was used to analyse data.

## RESULTS AND DISCUSSION

Our results show a statistically significant ( $P < 0.01$ ) increase in fasting blood glucose of male and female experimental rats with male rats being more affected. Urine glucose was negative in all groups. Suggesting that chronic consumption of honey may have a diabetogenic effect. This is in with work of Benard Thorens *et al* 1990; at Wali and Nadirs-Boni, 2007) who reported that increase in concentration of honey as a result of increase in

**Table 1: Show values of FBG and urine glucose results are presented in means and standard deviations (n=10)**

Group	FC	FE	t-value	P-value	Remarks
FBG	76.81±5.04	106.88±8.44	6.0	P<0.01	S
UG	0.0±0.0	Negative	-	-	NS
Group	MC	ME	t-value	P-value	Remark
FBG	79.27 ±18.83	171.91 ±28.76	5.39	P<0.01	S
UG	Negative	Negative	-	-	NS

**Table 2: Show result of weekly weight measurement presented in means and standard deviations (n=10)**

Group	Weight(g) in wk 1	Wt (g) in wk 2	Wt (g) in wk 3	Wk (g) wk 4	Wt (g) week 5
MC	106±9.0	112±8.6	125±13.1	137±6.3	142±18.2
ME	112±12.3	143±10.5	133±19.3	164±16	173±12.5
FC	98.6±6.3	107±10.2	126±13.0	135±10.8	139±16.0
FE	102±5.6	185±16.7	125±11.3	140±8.6	160±14.2

consumption with subsequent metabolism of disaccharide containing glucose may lead to hyperglycemia with its attendant effects on pancreatic islets, liver, blood and urine. Hyperglycemia reduces the expression of beta cell specific glucose transfer isoforms and the extent of reduction correlates with the severity of hyperglycemia. This from the view point excess consumption of honey may not be of benefit but may result in the establishment or aggravation of Diabetes Mellitus.

We also observed increase in weekly weight gain compared to control. However in the 3<sup>rd</sup> week when honey was withdrawn, there was a

sudden and severe drop in weight which further increased when honey was reintroduced in the fourth and fifth weeks. It is our view that this increase in weight may be of negative impact as obesity is one of the strongest predisposing factor in Metabolic syndrome. Thus increase in weight of persons who continuously consume honey may predispose them to obesity. And couple with hyperglycemia and possible dyslipidemia may result in metabolic syndrome (syndrome x). We therefore advocate that the use of honey as alternative to refined sugar in diabetics or those primitive to refined sugar in diabetics or those prime to diabetic, should be with caution. That is it should not be taken continuously and should be taken in very small quantities.

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