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Apr 25th, 9:00 AM - 11:00 AM

### Effect of the Golden Liquid from Honeybees and Refined Granulated Sugar on the Blood Glucose and Serum Iron Levels of Albino Rats.

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# Effect of the Golden Liquid from Honeybees and Refined Granulated Sugar on the Blood Glucose and Serum Iron Levels of Albino Rats

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## Background

- Natural honey is one of the most popular products because its chemical groups interact to provide nutritional and medicinal benefits.
- Modern people eat a lot of refined granulated sugar, directly or indirectly.
- Refined granulated sugar causes hematological and physiological abnormalities in humans.
- Honey is safer than refined granulated sugar, according to multiple research.
- Since honey contains hemoglobin precursor iron, using it raises serum iron and red blood cell numbers.
- Refined granulated sugar is a risk factor for obesity, metabolic syndrome, cardiovascular disease, type 2 diabetes, and non-alcoholic fatty liver disease.

## OBJECTIVE

- The objective was to test the effect of natural honey and refined granulated sugar on Wistar albino rats' blood glucose and serum iron levels.

## Methods

- The albino rats were separated into five treatment groups depending on the dosage of natural honey and granulated sugar: T1 (1.02g of honey /kg BW), T2 (1.40g), T3 (1.02g), and T4 (1.40g). T5 was the control group, receiving neither honey nor sugar.
- The experiment setup was random. Five albino rats per treatment.
- Glucose strips and glucometers measured albino rats' weekly blood glucose levels.
- Atomic Absorption Spectrophotometer to analyze serum iron according to APHA 1995 [1]. Excel 2019 was used to capture study data. ANOVA was performed on blood glucose and serum iron data from the five treatments.
- IBM SPSS statistics version 23 employed Turkey Honest Significant Difference (HSD) test at 5% significance to separate means.

## Results

Table 1. Blood glucose concentration in albino rats orally administered natural honey and refined granulated sugar for a period of three weeks

| Treatment | Weekly mean concentration of blood glucose (mg/dl) level $\pm$ SD |                                  |                                  | Mean blood glucose level (mg/dl) $\pm$ SD |
|-----------|---|----------------------------------|----------------------------------|---|
|           | Week 1  | Week 2                           | Week 3                           |   |
| T1        | 78.20 <sup>a</sup> $\pm$ 8.871                                    | 84.70 <sup>a</sup> $\pm$ 19.709  | 104.70 <sup>b</sup> $\pm$ 23.905 | 89.20 <sup>a</sup> $\pm$ 20.808           |
| T2        | 70.95 <sup>a</sup> $\pm$ 36.502                                   | 85.20 <sup>a</sup> $\pm$ 22.510  | 68.45 <sup>a</sup> $\pm$ 7.098   | 74.86 <sup>a</sup> $\pm$ 24.457           |
| T3        | 97.70 <sup>a</sup> $\pm$ 22.726                                   | 144.95 <sup>b</sup> $\pm$ 34.956 | 96.20 <sup>ab</sup> $\pm$ 21.993 | 112.95 <sup>b</sup> $\pm$ 34.407          |
| T4        | 93.70 <sup>a</sup> $\pm$ 21.058                                   | 94.45 <sup>a</sup> $\pm$ 18.341  | 87.45 <sup>ab</sup> $\pm$ 16.908 | 91.86 <sup>ab</sup> $\pm$ 17.749          |
| T5        | 92.45 <sup>a</sup> $\pm$ 22.19                                    | 94.95 <sup>a</sup> $\pm$ 21.045  | 89.20 <sup>ab</sup> $\pm$ 3.962  | 92.20 <sup>ab</sup> $\pm$ 16.663          |

Columns sharing similar superscripts are not significantly different ( $P>0.05$ )

Table 2. Serum iron concentration of albino rats orally administered natural honey and refined granulated sugar

| Treatment | Mean Serum iron level $\pm$ SD |
|-----------|--------------------------------|
| T1        | 0.88 <sup>a</sup> $\pm$ 1.319  |
| T2        | 1.22 <sup>a</sup> $\pm$ 0.115  |
| T3        | 1.04 <sup>a</sup> $\pm$ 0.277  |
| T4        | 0.99 <sup>a</sup> $\pm$ 0.299  |
| T5        | 1.31 <sup>a</sup> $\pm$ 0.395  |

Columns sharing similar superscripts are not significantly different ( $P>0.05$ )

- There was a significant difference in the blood glucose levels of albino rats orally administered natural honey and refined granulated sugar at varying levels ( $P<0.05$ ) among treatments.
- It was found that the highest serum iron level was recorded in T5 (1.31 $\pm$ 0.395 ppm) followed by T2 (1.22 $\pm$  0.115 ppm), while the least serum iron level was recorded in T1 (0.88 $\pm$ 1.319ppm).
- It was observed that there were no significant differences in the serum iron levels of the albino rats ( $p>0.05$ ) among treatments .

## Discussion & Conclusions

- It was concluded that the mean blood glucose level of albino rats orally administered natural honey at varying doses was significantly lower than those administered 1.02g of granulated sugar /kg BW.
- The use of natural honey is recommended since albino rats orally administered honey at varying doses had lower blood glucose levels than those given refined granulated sugar.
- This work was a useful tool for understanding the role of honey over granulated sugars, especially among prediabetic and diabetic patients in order to control their sugar levels using diet as a source.
- This implies that the consumption of natural honey did not significantly increase blood glucose levels.
- The result also showed that the mean blood glucose level of the albino rats was significantly lower at week 2 and week 3. This observation supports earlier reports [2] that daily ingestion of honey for three weeks progressively and effectively reduced blood glucose levels in rats with alloxan-induced diabetes
- It was therefore recommended that physicians and dietitians should advocate for natural honey use over refined granulated sugar which could be safe for consumption by diabetic patients.

## References

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- Adesoji F, Oluwakemi A. Differential effect of honey on selected variables in alloxan-induced and fructose-induced diabetic rats. African Journal of Biomedical Research. 2008;11(2).



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