CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

Nitya Mehrotra-Venkat

Project Number

S1219

Project Title

The Effect of Herbal Remedies on Alleviating Hyperglycemia in Type 2 Diabetes

Abstract

Objectives/Goals

The foremost goal of this study was to help diabetics keep low glucose levels without any pharmaceutical products.

Methods/Materials

This approach explores the use Bitter melon (Momordica charantia), Fenugreek (Trigonella foenum graecum), Neem (Azadirachta indica), Okra (Abelmoschus Esculentus), and Turmeric (Curcuma Longa), which are commonly used alternative remedies. Different forms of these herbal remedies were explored (pills, gels, roots) to assess their efficacy. Solutions of the above elements were created, the enzyme invertase was used to accelerate the hydrolysis and the resultant glucose levels measured using glucose reagent strips and Benedict#s reagent for accuracy. For the assurance of the accuracy of results, the reagent strips and invertase were calibrated; multiple in vitro measurements were conducted in a laboratory setting. In vivo testing was also done with two willing subjects, one diabetic and one non-diabetic. The diabetic patient still took their medicines so that they would not be negatively impacted from the study. Interviews (in-person and crowd sourced) with diabetics were done to gauge the acceptance and magnitude of use of the herbal remedies.

Results

The natural remedies that worked best among those tested were T. Foenum Graecum gel, T. Foenum Graecum powder, C. Longa tablet and C. Longa root # human and animal testing conducted in other research indicates that the high levels of fiber in such remedies slows glucose absorption during metabolism, resulting in better blood sugar control. From the interviews and crowdsourcing surveys, it was discovered many took or were willing to try herbal remedies, especially if they experienced side effects with medicines. In reference to the in vivo study, it was found that the glucose levels of the diabetic patient reduced while the glucose levels of the non-diabetic stayed the same.

Conclusions/Discussion

The major finding of the study was that herbal remedies do indeed lower the glucose levels with T. Foenum Graecum powder, T. Foenum Graecum gel, C. Longa root and the C. Longa powder being the most effective. The experiments indicated a correlation between the effectiveness of the herbal remedy and the amount of fiber in the remedy. Non-diabetics were unaffected by the natural remedies, indicating that they do not lead to hypoglycemia and may be a good solution for pre-diabetics.

Summary Statement

My project evaluates the effectiveness of herbal remedies as a way to help Type 2 Diabetics lower their blood glucose.

Help Received

Received advice on methodology and information of the physiological aspects of diabetes from Dr. Ram K. Sindhu; Used lab equipment at UCI under the supervision of Dr. Andy Borovik and Mr. Sam Mann; Dr. Nalini Venkatasubramanian and Dr. Sharad Mehrotra taught me about different crowdsourcing