Lycotec

LYCOFLAVON™

Treatment for Insulin Resistance – Glycemic Control

Insulin resistance is one of the main causes of the development of diabetes II and obesity. Despite a growing global spread of these diseases, the number of successful therapies that increase insulin sensitivity is very limited.

Lycoflavon

Is a new combinatory product where molecules of Genistein and Diadzein Isoflavones, GDI, which can increase the expression of insulin receptors, are embedded into clusters of *trans*-lycopene. This embedment, LYCOFLAVON, provides protection of the former from the stomach environment by the acid resistant molecules of the latter. As a result of this, low doses of the isoflavones can be used to achieve a comparable or even superior therapeutic effect to that of its unprotected form.

In addition, *trans*-lycopene serves in this formulation not only as a facilitating delivery entity, but also as a bioactive anti-hypoxia molecule, which is important for improvement of the microcirculation in skeletal muscles, and in particular in steatotic tissues of the liver and pancreas. Therefore, a combination of high potency GDI and lycopene molecules could provide a synergetic therapeutic effect in patients with insulin resistance.

Animal studies

Two groups of 8 pre-diabetic 7-week-old Zucker Diabetic Fatty (ZDF) rats were fed either with a control chow or one mixed with 0.2% LYCOFLAVON. After 6 weeks the control rats developed fatty liver and insulin resistance. However, in the rats fed with LYCOFLAVON, fasting plasma glucose and liver triglycerides were about 50% lower than in the control group, table 1.

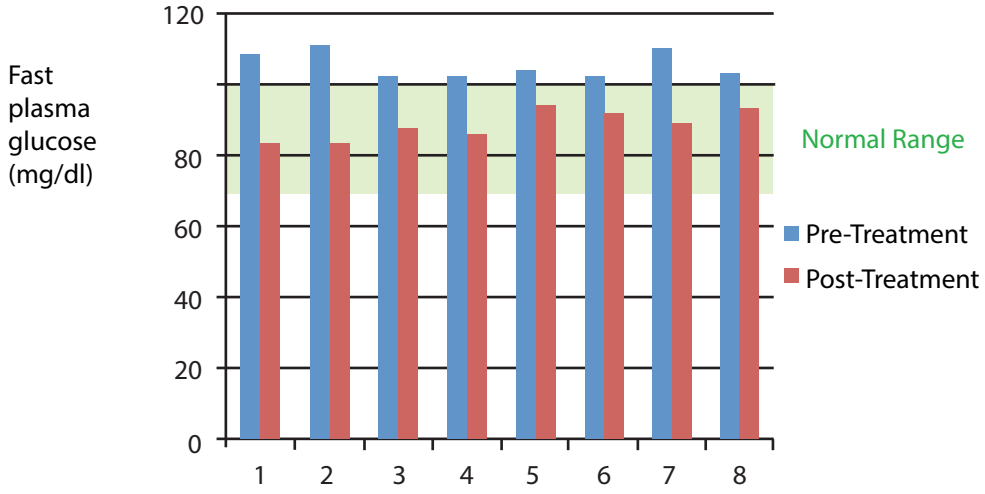
Table 1. Effect of LYCOFLAVON on pre-diabetic ZDF rats

Parameters	6% Chow Control	6% Chow + 0.2% LYCOFLAVON
Body weight, g	477.25 ± 20.7	460.75 ± 39.3
Plasma glucose, mg/dL	171.25 ± 53.97	83.5 ± 13.47
Plasma TG, mg/dL	509.58 ± 63.07	335.85 ± 71.46
Plasma CH, mg/dL	177.18 ± 11.26	131.15 ± 7.01
Liver weight, g	21.2 ± 1.12	17.35 ± 2.44
Liver TG, mg/g	20.43± 3.18	11.97 ± 2.21

In addition, it was found that LYCOFLAVON suppressed the major insulin regulated gluconeogenic enzymes in the liver, PEPCK and G6Pase.

Pharmacodynamics - Fasting Glucose

In an open-label clinical trial on 8 middle-aged patients with metabolic syndrome, daily oral administration for 4 weeks of LYCOFLAVON, the daily dose of which contained 50 mg of GDI embedded into 7 mg of *trans*-lycopene, resulted in a reduction of fasting glucose by 10-25 mg/dL.



Insulin Resistance – Clinical Trial Phase II

Professor Nicola Abate, University of Texas Medical Branch, Galveston, USA
An open-label study was undertaken on 31 normoglycemic volunteers, 18 – 45 years old, with daily oral administration for 16 weeks of LYCOFLAVON, the daily dose of which contained 50 mg of GDI embedded into 7 mg of trans-lycopene. Insulin sensitivity was measured by an euglycemic hyperinsulinemic clamp, using an insulin infusion protocol of 80 mU/m2/min. 25 of the 31 participants completed the clamp study before and after treatment.

In those persons with a baseline Rd below 6 mg/min/kg of body mass (n=19) there was a 9% increase in glucose disposal rate with an average post-treatment value of 4.21 + 1.45 vs baseline 3.86 + 1.26 mg/min/kg, $p<0.05$. In the remaining 6 participants who were insulin sensitive at baseline, no changes were recorded. This level of change in insulin resistance was on a par with Metformin, which is typically around 10%, and more effective than Thiazolidinediones, 5%.

Himara Davila Arroyo, MD, Wengton Pan, M.D.; Manish Saraf, Ph.D.; Geetika Saraf; Manisha Chandalia M.D.; Nicola Abate, M.D. - A PILOT STUDY ON TREATMENT EFFECT OF LYCOPENE AND ISOFLAVONES ON INSULIN RESISTANCE. (2011) Diabetes Mellitus, Abstract 205, p.23-24.

Next Step

The main objective of Lycotec is to find funding and/or a partner to take LYCOFLAVON to a larger double blind clinical trial programme to assess further its impact on insulin resistance.

Regulatory

All molecules comprising LYCOFLAVON are safe for humans and do not require FDA or other countries' regulatory body approval for oral administration in their therapeutic dose-range.

For more information and enquiries please contact: info@lycotec.com | www.lycotec.com