

## Efficacy of the Mexican Naturopathy, Feeding, Exercise and Fasting (Ca Ye Cualli Aztec Health Model) in Management of Hypertriglyceridemia: A Case Report

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### Abstract

Hypertriglyceridemia is associated with a high risk of mortality and cardiovascular disease. In Mexico, the most common type of dyslipidemia is hypertriglyceridemia with a prevalence of 19.5%. Nevertheless, this percentage may increase because of those populations that have not been diagnosed and do not go to health services. Ca Ye Cualli is an individualized health model based on Aztec wisdom which includes naturopathy, adequate feeding, exercise, and fasting. In 2011, a 48-year-old female obese was diagnosed with hypertriglyceridemia. After 9 years in dealing with different doctors and not being satisfied with the results, she chose to try the Mexican Ca Ye Cualli treatment in July 2020. The patient had generalized tiredness, hair loss, increased body weight, constipation, a family history of cancer, diabetes mellitus, and obesity. The results of this study, after 32 weeks of treatment, showed a reduction in weight, BMI, %fat, blood pressure, total cholesterol, no-HDL cholesterol, triglycerides, total lipids, blood glucose and TSH. The patient showed an increase of energy and wellness. As a result, this case suggests that Ca Ye Cualli Aztec Health Model is feasible and safe in the management of hypertriglyceridemia. Further studies are required to warranty these results.

**Keywords:** Aztec health model; Hypertriglyceridemia; Naturopathy; Fasting

### Introduction

Hypertriglyceridemia is a condition that is associated with a high risk of mortality, cardiovascular disease and arteriosclerosis [1]. Cardiovascular diseases lead the global mortality in the world estimating 17.8 million of deaths worldwide [2] (without taking into account the COVID-19 pandemic). Cardiovascular disease, on the other hand, is the main cause of death in Mexico with a prevalence of 20.8%. Hypertriglyceridemia is the most common type of dyslipidemia in this country with a prevalence of high triglyceride and cholesterol concentrations of 19.5% in the population over 20 years of age according to the latest National Health and Nutrition Survey 2018 [3] but this figure is increased by those populations that have not been diagnosed and do not go to health. Hypertriglyceridemia is known to be caused by genetic and environmental factors. Among the latter are obesity, uncontrolled diabetes, hypothyroidism, kidney disorders, systemic lupus erythematosus, sedentary lifestyle, excessive alcohol, tobacco or drug use and medication such as estrogens, anabolic, tamoxifen, thiazides, non-cardioselective beta blockers, cyclophosphamide, cyclosporine, protease inhibitors, bile acid sequestrants, clozapine, atypical antipsychotics, and antidepressants [4]. Classic clinical management of the patient with hypertriglyceridemia includes lifestyle modification, weight loss, blood glucose control and medication. In the Ca Ye Cualli Aztec health model, the treatment is individualized with naturopathy, adequate diet to the patient's situation, physical activity and fasting. This model is based on the wisdom of Aztec culture [5-7] and contemplating contemporary studies on the various diseases most

prevalent in Mexico and the world [8-10]. This case study was performed to evaluate the feasibility of this model in the management of a patient with hypertriglyceridemia for improving her lipid profile to desirable values as well as anthropometric indicators.

### Case Presentation

Mrs. MRHG, a 48-year-old female with sedentary lifestyle, attended consultation in Mexico City on July 14, 2020. She had generalized tiredness, hair loss, increased body weight and constipation problems. She started with high triglycerides for 10 years for which she went 3 with different doctors who prescribed medications. However, her concentrations have not been able to stabilize due to her sedentary lifestyle in addition to a diet rich in simple carbohydrates, saturated fats and the fact that she has decided not to take her medications systematically. She has a family history of diabetes, cancer and obesity. She says that from the beginning of the COVID-19 pandemic she suffers from stress and anxiety that tries to calm her down by eating food, especially junk food. Her initial weight was 87.4 Kg (192.68 lb), height of 1.66 m (5.44 ft) with a BMI of 31.3 Kg/m<sup>2</sup>, her pulse rate was 78 beats/minute and blood pressure 126/79 mmHg. Before consultation she was taking atorvastatin 40 mg a tablet daily and bezafibrate 200 mg two pills daily and novotiral 100 mcg/20 mcg a daily pill. All this treatment was indicated by a private physician in Mexico City however the patient notes that these medical indications did not follow them properly. At the beginning of the consultation with the Health Model Ca Ye Cualli began to take in a systematically bezafibrate 200 mg one pill a day. Height was recorded

on a stadiometer SECA 206. Weights, %of body fat, were measured with the Tanita Scale Segmental Body Composition Monitor BC-545F. Resting blood pressure was measured during the doctor's visit using a standard sphygmomanometer Liftman Quality. Medical and nutritional history was recorded since the first consultation in addition to obtaining the signed informed consent. The intervention was planned by a team of consultants that included a naturopathic doctor and dietitian. The patient's metabolic indicators were determined at the start of the consultation and after 32 weeks in a private clinical analysis laboratory in Mexico City with experience in taking blood samples and processing them. In relation to naturopathy, she was prescribed daily to treat teas and extracts with mixtures of Mexican medicinal plants that included: *-Tilia platyphyllos*, *Azahar*, *Citrus aurantifolia*, *Casimiroa edulis*, *Ipomoea stans* Cav., *Rhizoma gastrodine*, *Foeniculum vulgare*, *Melissa officinalis*, *Viscum album*, *Chiranthodendron pentadactylon* *Rhizoma gastrodine*, *Foeniculum vulgare*, *Melissa officinalis*, *Viscum album* and *Chiranthodendron pentadactylon*-*Olea europaea*-*Pajosa-Smilax aspera*. The patient was indicated a food plan with energy reduction of 500 Kcal every day based on her energy recommendations including foods of Mesoamerican origin and high in omega-3 fatty acids and functional properties such as chia and amaranth, quelites, nopales, blue corn, huitlacoche [11-13]. In relation to physical activity, she was told daily walk of at least 30 minutes daily during the first 3 weeks and then increase to a daily hour. Her fasting plan began once the patient fully adopted her food plan consistently (three months) which consisted of: 8 hours daily/2 weeks, followed by 16 hours per day/1 week and then going to 18 hours 3 times during a week. Fasting was indicated to cover most of the hours for sleeping.

## Results

The results showed reduction in body weight of 9%, BMI of 8%, %of body fat of 5, blood pressure (systolic) of 4%, blood pressure (diastolic) of 6%, cholesterol of 28%, triglycerides of 85%, No-HDL Cholesterol, 39%, Total lipids of 77% and fasting blood glucose of 17%. TSH concentrations changed towards normal reference parameters visible in Table 1. In her early days of fasting therapy, she referred to a headache during the first 2 days which subsequently disappeared. It is important to note that the patient had no side effects during treatment.

	Triglycerides (mg/dL)	1951	285
	Total lipids (mg/dL)	2961	702
	Blood glucose (mg/dL)	118 mg/dL	98
	TSH	<0.010	1.24

**Table 1:** Baseline and follow-up assessments of the patient.

## Discussion

After the implementation of a 32-week protocol with this health Model, a 48-year-old woman presented positive progress in her metabolic indicators, especially in lipids. In the 5 scientific literatures, there is no similar research with the components of the Mexican Aztec model, Ca Ye Cualli (naturopathy, adequate feeding, exercise, and fasting). However, comparing it with different studies with some of its components the results are interesting. For example, a study from China with alternate-day fasting and time-restricted feeding, along with proper diet, a weight reduction was achieved of 5% in 12 weeks [14]. The Mexican health model case study compared to this China research, shows a 1.8% greater efficiency in weight reduction (9% in 34 weeks). Another meta-analysis research of 70 studies where weight loss was assessed for different dietary interventions, it was found that, for each kilogram of weight lost, the concentration of serum triglycerides, decreased by about 1.5 mg/dL [15]. In our case study with the Ca Ye Cualli model, for each kilogram of lost weight, 216 mg/dL was reduced being an important difference. A controlled study with 246 Canadian patients was found that naturopathy, along with healthy eating, had resulted in a lower cardiovascular risk of (7.74%) compared with the control group (10.81%) [16]. Although in our case study, this parameter was not calculated, we find positive changes in the decrease of 5 out of 7 cardiovascular risk criteria analyzed under the approaches proposed by the American Heart Association [1]. See in Table 2, it can be observed that the parameters that were improved in terms of cardiovascular risk were BMI, physical activity, total cholesterol, fasting plasma glucose, and healthy diet. On the other hand, it draws attention to a relevant improvement in triglyceride figures which fell by 85%. A review study with different therapeutics with total fasting [17] found a decrease between 17% and 50% for a total fast between 12 and 24 weeks which indicates that possibly the effect of naturopathy, health diet, physical activity in addition to fasting played an important role in the descent of this indicator in the Aztec health model.

Approach	Baseline	32 weeks follow-up
Current smoking	Ideal	Ideal
BMI	Poor	Intermediate
Physical activity	Poor	Ideal
Healthy diet	Poor	Ideal
Total cholesterol	Poor	Ideal
Blood pressure	Intermediate	Intermediate
Fasting plasma glucose	Intermediate	Ideal

**Table 2:** Changes of the approaches to staying heart healthy according to the american heart association [1] for the Ca Ye Cualli health model case study.

	Variables	Baseline	32 weeks Follow up
Anthropometric parameters	Weight (Kg)	87.4	79.7
	BMI (Kg/m <sup>2</sup> )	31.3	28.9
	% of Body Fat	39.2	37.1
Blood pressure	Systolic (mmHg)	126	121
	Diastolic (mmHg)	79	74
Lipid profile	Cholesterol (mg/dL)	258	186
	LDL Cholesterol (mg/dL)	34	101
	No-HDL Cholesterol	242	148

Apparently, after 32 weeks, the values found for LDL cholesterol were not positive because LDL cholesterol concentration increased from 34 mg/dL to 101 mg/dL. Here, it is important to note. When triglyceride values are high (>400 mg/dL), as it is in our case study, measurements for LDL cholesterol are not considered reliable because their variability has been increased. In this sense, it is recommended to determine them when triglyceride concentrations have reached normal values [18] which has not been possible in our study. Finally, the change in TSH concentrations is striking, which after the application of the Ca Ye Cualli model were adjusted to the normal reference parameters. We also attribute the improvement of blood glucose to the reduction of lipid profile with a small contribution of body weight which leads to increased insulin sensitivity.

### Strengths of the study

It was a safe intervention and without side effects. The patient adhered to the treatment. It has been effective to reduce weight, %of body fat, blood pressure BMI, TSH and lipid profile, especially triglycerides.

### Study limitations

The validity of the data can be questioned as it was only a case, so the results cannot be extrapolated. However, these may be a starting point for a subsequent observational study.

### Conclusion

The Ca Ye Cualli Health Model is useful in the management of hypertriglyceridemia and improving the lipid profile such as triglycerides, total lipids, total cholesterol, No-HDL Cholesterol and blood glucose concentrations, TSH as well as anthropometric indicators such as weight, BMI and %of body fat making it a good choice for treating this condition.

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