EFFECT OF ORAL SUPPLEMENTATION OF UNDENERUTED CYSTEINE RICH WHEY PROTEIN ISOLATE ON NON-ALCOHOLIC STEATOHEPATITIS PATIENTS

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INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) is becoming a common cause of chronic liver disease worldwide reflecting the increasing prevalence of obesity and diabetes. Non-alcoholic steatohepatitis (NASH) is part of a spectrum of NAFLD that ranges from pure fatty liver (steatosis) to steatohepatitis and to cirrhosis. Long-standing NASH with cirrhosis has been associated with the development of hepatocellular carcinoma. There are no medical drugs approved for the treatment of NASH.

The pathogenesis of NASH is not well defined. Hepatocyte and plasma glutathione (GSH) decreased in nonalcoholic liver disease patients, whereas glutathione disulfide (GSSG) increased. As a consequence, to increase glutathione concentrations and to compensate for the oxidant-antioxidant imbalance have become a focus of clinical research.

HMS 90®, a undenatured cytoine rich whey protein isolate, has been proven to raise glutathione levels by supplying the precursors required for intracellular glutathione synthesis. This has been demonstrated in several glutathione deficient patient groups. Consequently, a pilot, prospective clinical study was performed to determine the potential benefits of supplementation with undenatured cytoine rich whey protein isolate (HMS 90®) in untreated patients with NASH.

METHODS

1. Patients enrolment

Study participants were recruited by the Division of Gastroenterology and Hepatology at the Faculty of Medicine, Chiang Mai University.

Inclusion criteria:
- Male/Female age between 15 and 60 years.
- Diagnosis of NASH:
  - Persistent elevation of aminotransferases at least 1.5 times the upper limit of the normal range for at least 3 months
- Unchanged computed tomography showing low parenchymal liver attenuation diagnostic for hepatic macrovesicular steatosis.

Exclusion criteria:
- Weekly ethanol consumption of more than 40 g as confirmed through interview with the patients.
- Pregnancy or lactation.
- History of cow milk’s protein allergy.

2. Experimental Design

Dosing - Patients were instructed to take 20 g per day of undenatured cysteine rich whey protein isolate (HMS 90®) for 12 weeks in two equal portions of 10g mixed with water. No dose adjustments were made for patient weight.

Evaluation - The following information was collected according to the patient visit schedule:
- Clinical assessment
- Adverse events
- Concurrent medication
- Protocol compliance
- Body weight, height, waist and hip circumference, systolic and diastolic blood pressure was measured.
- Blood samples - to allow measurement of biochemical parameters.

3. Objective assessment of NASH by Computed Tomography

CT Results

The mean LAI values at baseline and at the end of the study are shown on Table 4.

RESULTS

Patients Enrolled

Fifty six (56) patients suspected of having NASH were evaluated and 38 patients were enrolled. The mean age and standard deviation (SD) of the subjects were 49 years (SD 14 years). The demographic features of the patient population at baseline are given in Table 1.

Anthropometric Results

The baseline and measures of change in biochemical parameters are listed in Table 2. The clinical and biochemical data at baseline and after 12 weeks supplementation are summarized in Table 3.

Biochemical Responses

The baseline and changes in serum biochemistry after 12 weeks supplementation with undenatured cysteine rich whey protein isolate are summarized in Table 4.

CONCLUSIONS

Unadenatured cytoine rich whey protein isolate (HMS 90®) supplementation of NASH patients leads to a significant reduction of hepatic steatosis, a significant reduction of AST and ALT levels and a significant increase of plasma glutathione levels. Supplementation with this protein might well find other applications for patients where oxidative stress and pathology of glutathione deficiency are implicated.