

## Abstract

Four week trials were conducted on a total of 59 females between the ages of 20 and 55, with no major medical illness. They were placed on a 500 calorie diet (50% protein). Measured parameters: weight, body composition via bioimpedance, blood pressure, and blood labs were performed. Subjects received daily hCG or saline (placebo) subcutaneous injections. After 4 weeks, the subjects body compositions were analyzed for overall change. There was significantly more muscle lost in the placebo group versus the HCG group. Overall weight loss was similar between the two groups. This lends support to the theory that HCG is acting to preserve lean body mass during a calorie deprived state.

## Objectives

Objective: To elucidate the role that human chorionic gonadotropin (hCG) may have on body composition during weight loss.

This controversial topic has been under investigation for over fifty years. Repeated clinical trials have failed to show any significant difference in weight loss between HCG and placebo. The proposed theory is that HCG being a prohormone should serve to counteract muscle catabolism during a calorie deprived state. This trial was designed to analyze changes in body composition and therefore help to clarify whether or not HCG is in fact preserving lean muscle mass, thereby allowing for a more selective fat loss, by default.

## Materials & Methods

59 females were randomized to HCG or Placebo Study Groups. All subjects were between the ages of 20 and 55, with no major medical conditions.

Recorded variables: weight, body composition, blood pressure, blood labs (CBC, complete metabolic panel, thyroid panel, hormones, and B-HCG), and in some patients, EKG. All were placed on a 500 calorie diet (approximately 50% protein) and were instructed to keep a diary of progress, hunger, and a food log. Subjects were randomized to HCG or placebo (saline) and injected between 200 and 300 IU subcutaneously daily for 4 weeks. Weekly follow-up visits were required during which patients received repeat weight, blood pressure, and medical evaluation. Blood tests were conducted every 2 weeks for electrolyte, hormone, and lipid monitoring.

Of the subjects, there were 30 HCG and 29 Placebo. Six subjects dropped out in each group. In the placebo group, five were noncompliant and one had a starting BMI less than 25, and thus were eliminated from analysis. In the HCG group, three were noncompliant (weight loss less than 5 lbs or extreme outlier (1) and one had a starting BMI less than 25, and thus were eliminated from analysis.

Median weight loss achieved in each group was 14 pounds. The mean was 14 pounds in HCG and 15 pounds in placebo. Median fat loss was 11 pounds in HCG, 9.2 in placebo. Median muscle loss was 3.2 in HCG and 4.8 in placebo. The means were 2.7 and 5.4, respectively.

## Discussion

ANALYSIS: Mann-Whitney U Test Median Comparison: HCG vs. placebo. Primary endpoint: weight change. Secondary endpoints: change in muscle mass and change in fat mass.

RESULTS: PRIMARY: no significant difference in weight loss between the two groups ( $p=0.5521$ ), SECONDARY: Comparison of fat mass loss was not significant, with a  $p$  of 0.4189.

Comparison of muscle mass loss was **significant at a p-value of 0.0303** with the HCG group retaining more muscle.

As was expected, on a 500 calorie diet, nearly equivalent amounts of weight will be lost. The difference is in that the body will preferentially burn fat for energy and protect muscle in the HCG group versus the placebo group.

## Conclusions

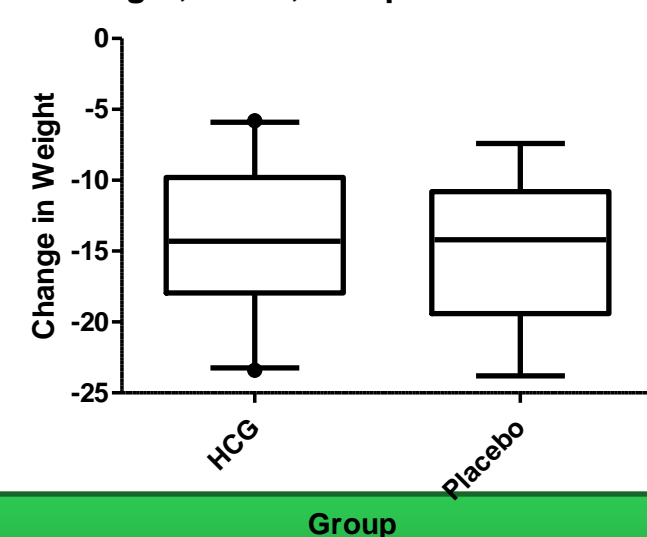
HCG has been questioned as a weight loss aid due to the numerous dated studies that showed HCG had no impact on overall weight loss than placebo. To that we are in agreement. HCG demonstrates no significant stimulant properties or weight loss beyond diet alone. Rather it is a tool for creating a stable environment in the body during a VLCD to prevent the sarcopenia that occurs with use of such a diet. This muscle preservation is favorable due to maintenance of metabolism and physique, and therefore should be reconsidered as an aid to rapid weight loss methods.

## References

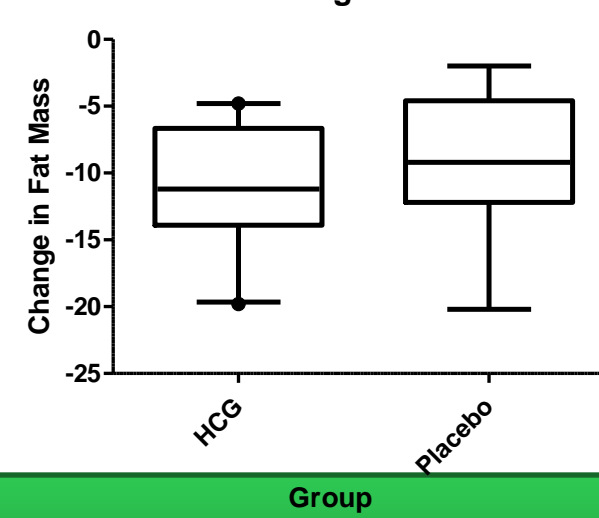
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## HCG vs. PLACEBO RESULTS:

Change in Weight, 4 wks, Completers & lost at least 5 lbs



Change in Fat Mass, 4 wks, Completers who lost at least 5 lbs of overall Weight



Change in Muscle Mass, 4 wks, Completers who lost at least 5 lbs of overall weight

