

# The Effect of a Very Low Carbohydrate Diet on Residual Dyslipidemia in Statin Treated Overweight Patients

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## ABSTRACT

### Introduction:

Obesity, hypercholesterolemia, and hypertriglyceridemia are potent, independent risk factors for the development of cardiovascular (CV) disease. Statin agents significantly improve dyslipidemias, but frequently do not achieve the desired goal leaving residual dyslipidemias and CV risk. Low carbohydrate diets can lead to weight loss, lower total cholesterol (TC), lower non-high density lipoprotein cholesterol (non-HDL) and lower triglycerides (TG). We sought to determine the effectiveness of a very low carbohydrate diet on weight loss and the residual dyslipidemias in statin treated patients.

### Methods:

40 patients who were on statin therapy and had residual dyslipidemia, defined as TC greater than 200, non-HDL greater than 160, or TG greater than 150, started on a very low carbohydrate diet as part of the Ideal Protein Weight Loss Method (IPWLM). The IPWLM is a 4 stage, partial meal supplement, ketogenic diet that has low carbohydrate, low fat, and normal protein intake. Lipids were measured before and again 12 weeks after starting the program. Weight and waist measurements were also measured. A statistical paired t-test was performed on all data sets.

### Results:

36 patients completed at least 12 weeks of this diet for a 90% compliance rate. Weight and waist size decreased from 255.3±40.5 to 219.5±34.5 lbs ( $p<0.001$ ) and 49.2±4.8 to 43.6±4.4 inches ( $p<0.001$ ), respectively. TC fell from 185.1±44.3 to 153.6±41.7 mg/dl ( $p<0.001$ ) while non-HDL also fell from 139.3±39.3 to 104.8±38.7 mg/dl ( $p<0.001$ ). TG had a significant drop from 213.8±105.9 to 90.1±36.6 mg/dl ( $p<0.001$ ). The effect of the IPWLM on lipid parameters is listed in the graph below.

### Conclusion:

The IPWLM has a powerful effect on lipid abnormalities and can significantly improve the residual dyslipidemia in statin treated patients. Further investigation and long term results of the role of a very low carbohydrate diet on treating residual dyslipidemias is indicated.

### Introduction:

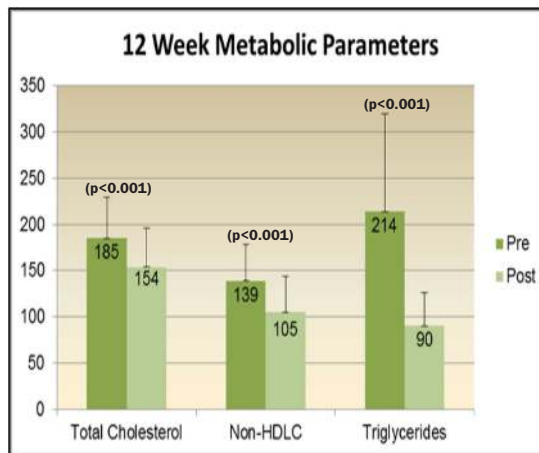
- Obesity and elevated levels of total cholesterol (TC), non-HDL cholesterol and Triglycerides (TG) are established independent cardiovascular (CV) risk factors.
- Statin agents significantly improve dyslipidemias but often without achieving lipid parameter goals.
- Residual dyslipidemias sometimes remain despite statin therapy.
- Diets low in carbohydrates can improve lipid parameters independent of statin use.
- IPWLM is a low carbohydrate, low fat and normal protein diet.
- We sought to determine the efficacy of IPWLM in reducing residual dyslipidemias in statin treated patients.

### Methods:

- 1) 40 patients with residual dyslipidemia participated in the 4-stage program which included:
  - Ketogenic partial meal replacement diet with low carbohydrates, low fat and normal protein.
- 2) Measurements included:
  - Lipid panel before and 12 weeks into the program.
  - Weight and waist measurements before and 12 weeks into the program.

### Results:

- 1) 36 patients completed at least 12 weeks of the diet with a 90% compliance rate.
- 2) Weight decreased from 255.3±40.5 to 219.5±34.5 lbs ( $p<0.001$ ).
- 3) Waist size decreased from 49.2±4.8 to 43.6±4.4 inches ( $p<0.001$ ).
- 4) Total Cholesterol decreased from 185.1±44.3 to 153.6±41.7 mg/dl ( $p<0.001$ ).
- 5) Non-high density lipoprotein cholesterol decreased from 139.3±39.3 to 104.8±38.7 mg/dl ( $p<0.001$ ).
- 6) Triglycerides dropped significantly from 213.8±105.9 to 90.1±36.6 mg/dl ( $p<0.001$ ).



### Final Conclusions:

- 1) The IPWLM significantly improves the residual lipid abnormality present in patients on statin therapy.
- 2) Significant improvements in blood pressure, lipid profile, and fasting glucose levels suggest the method should decrease cardiovascular risk.
- 3) The long-term effect of this method in patients with lipid abnormalities needs to be explored.



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