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Effect of Modified Atkins Diet on Short Term and Intermediate Term Weight Loss

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ABSTRACT

To assess the effect of modified Atkins diet and exercise on short term and intermediate term. Randomised control trial. 150 subjects were included in the study who were divided into 3 sub-groups (n=50). Effect of modified Atkins diet and exercise was determined over a period of 3 months (short term) and 6 months (Intermediate term). The results were analysed by applying ANOVA (Fisher's F Test) and Tukey's Test. The average weight loss in group 2 (following modified Atkins diet) was significantly higher than group 1 (control), at the end of 3 months (3 ± 0.9), $p < 0.05$ and also at the end of 6 months (5 ± 1.1), $p < 0.05$. The average weight loss in group 3 (following modified Atkins diet plus structured weight loss exercise programme) was significantly higher than group 1 at the end of 3 months (7 ± 1.3), $p < 0.05$ and also at the end of 6 months (10 ± 1.5), $p < 0.05$. The average weight loss in group 3 was significantly higher than group 2 at the end of 3 months (7 ± 1.3), $p < 0.05$ and also at the end of 6 months (10 ± 1.5), $p < 0.05$. Modified Atkins diet was effective in weight reduction both in short term and intermediate term studies. The effect of exercise along with modified Atkins diet had an additive effect and resulted in greater weight loss than Atkin's diet alone.

Keywords: modified Atkins, low carbohydrate, high protein, weight loss

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INTRODUCTION

The Atkins diet, sometimes called the "Atkins Nutritional" approach, is a low-carbohydrate (high fat and high protein) diet created by Dr. Robert Atkins during the 1970's. The basic premise of the diet is that eating refined carbohydrates, such as sugar, high fructose corn syrup and flour, is one of the main contributors to obesity. The theory is that restricting carbohydrates causes the body to burn stored fat for energy instead of burning glucose for energy. His concepts regarding weight loss have been controversial, but the diet has enjoyed popularity for several decades [1].

Previous studies comparing low-carbohydrate and low-fat diets have not included a comprehensive exercise routine, resulting in suboptimal weight loss. They also didn't evaluate conclusively the results of a short term (6 month) program with modified Atkins diet with or without a weight loss exercise routine.

Foster GD et al [2], evaluated the effects of 2-year treatment with a low-carbohydrate or low-fat diet, each of which was combined with a comprehensive lifestyle modification program. They concluded that weight loss was approximately 11 kg (11%) at 1 year and 7 kg (7%) at 2 years.

MATERIALS AND METHODS

Methods

One hundred and fifty subjects were included in the study. They all belonged to the overweight category (BMI between 25-29.9). The subjects were randomly subdivided into 3 sub-groups.

Mean age of the subjects were 25-40 yrs (SD, ± 2 yrs) and a mean BMI of 27.1(SD, ± 2.9 kg/m²).

The study was conducted for a period of 6 months.

Study design: Randomised control trial.

Group 1 (n=50): consisted of those who were neither following modified Atkins diet, nor assigned any exercise routine. They continued with their sedentary life-style.

Group2(n=50): consisted of those subjects who were only following modified Atkins diet, but they were not assigned any exercise routine. The subjects in this group also continued with their sedentary life-style



Group3(n=50): consisted of those subjects who followed modified Atkins diet as well as were assigned a weight loss exercise routine which consisted of 30 mins of aerobic workout per day (10 mins of Trademill, 10 mins of cross trainer and 10 mins of cycling)

This exercise schedule was chosen because of convenience and easy availability of the instruments as well as good subject compliance.

A modified Atkins diet i.e. low-carbohydrate diet, which consisted of limited carbohydrate intake (25 g/d for 6 months) in the form of low-glycemic index vegetables with unrestricted consumption of fat and protein, approximately 65g/d of fat and 85-90g of protein per day (adding upto an energy consumption of 1800 to 2000 kcal/d) was given to the subjects in Subgroup 2 and 3.

The subjects in sub-group 1 were given a regular/ high carbohydrate diet with a total calorie intake of upto 2000 kcal/day

Weights were taken at the commencement of the study and at the end of 3rd and 6th month.

RESULTS

The mean BMI at the commencement of study in all the 3 groups were 27.1 ± 2.9 . At the end of 3 months, the average weight gain in sub-group 1 was 1 kg, The average weight loss in sub-group 2 was 3 kg and sub-group 3 was 7 kg, for the same duration of study. This implies that at the end of 3 months, the greatest weight loss was seen in Group 3 who followed modified Atkins diet as well as a structured weight loss program.

At the end of 6 months, the average weight gain in sub-group 1 was 3 kg. Average weight loss in sub-group 2 was 5 kg and group 3 was 10 kg during the same period. This implies that at the end of 6 months, the greatest weight loss was seen in sub-group 3 who followed, modified Atkins diet as well as a structured weight loss exercise programme. It was also noted that the magnitude of weight loss in kg was greater at the end of 3 months as compared to 6 months in groups 2 & 3.

Total comparison was done by ANOVA (Fisher's F Test) and Inter group comparisons were done by using TUKEY'S Test.

The inter - group comparisons are shown in Table 1, 2 and 3.

Table 1

Parameters	Group 1 n=50	Group 2 n=50	p value
Mean weight loss or gain in (kg) at the end of 3 months	+1 ± 0.3	-3 ± 0.9	<0.05**
Mean weight loss in (kg) at the end of 6 months	+3 ± 0.7	-5 ± 1.1	<0.05**

Table 2

Parameters	Group 1 n=50	Group 3 n=50	p value
Mean weight loss or gain in (kg) at the end of 3 months	+1 ± 0.3	-7 ± 1.3	<0.05**
Mean weight loss in (kg) at the end of 6 months	+3 ± 0.7	-10 ± 1.5	<0.05**

Table 3

Parameters	Group 2 n=50	Group 3 n=50	p value
Mean weight loss or gain in (kg) at the end of 3 months	-3 ± 0.9	-7 ± 1.3	<0.05**
Mean weight loss in (kg) at the end of 6 months	5 ± 1.1	10 ± 1.5	<0.05**

**p<0.05 is significant

(+) indicates-weight gain

(-) indicates- weight loss

As shown in table 1, the average weight loss in sub-group 2 was significantly higher than sub-group 1 at the end of 3 months (3 ± 0.9), p<0.05 and also at the end of 6 months (5 ± 1.1), p<0.05.

As shown in table 2, the average weight loss in sub-group 3 was significantly higher than sub-group 1 at the end of 3 months (7 ± 1.3), p<0.05 and also at the end of 6 months (10 ± 1.5), p<0.05.

As shown in table 2, the average weight loss in sub-group 3 was significantly higher than sub-group 2 at the end of 3 months (7 ± 1.3), p<0.05 and also at the end of 6 months (10 ± 1.5), p<0.05.



DISCUSSION

Atkins diet acts presumably by restricting carbohydrates drastically to a mere fraction of that found in the typical American diet, the body goes into a state of ketosis, which means it burns its own fat for fuel. A person in ketosis is getting energy from ketones, little carbon fragments that are the fuel created by the breakdown of fat stores. When the body is in ketosis, body tend to feel less hungry, and thus you're likely to eat less than you might otherwise. However, ketosis can also cause a variety of unpleasant effects (such as unusual breath odor and constipation) in a small number of people [3].

As a result, body changes from a carbohydrate-burning engine into a fat-burning engine. The purported result: weight loss. This is evident from Table 1, 2 and 3.

However, for most people, the carbohydrate consumption must be no more than 40 grams a day for this biochemical mechanism to occur. Although exercise isn't stressed, the Atkins theory holds that some people will need to add physical activity for ketosis to kick in. People are urged to supplement with vitamins, since they won't be getting them from sources such as vegetables and fruits.

On the Atkins diet, one is eating almost pure protein and fat. Red meat, fish (including shellfish), fowl, and regular cheese (not "diet" cheese, cheese spreads, or whey cheeses) can be consumed [4].

On the other hand, carbohydrate are restricted (about 25 grams of net carbohydrate per day, meaning total carbohydrate minus fiber) in the first two weeks, which translates to three cups of loosely packed salad or two cups of salad with two-thirds cup of certain cooked vegetables each day. [5]

There are no exceptions to these rules during the first two weeks because low-carbohydrate consumption (no fruits and only a few leafy green vegetables) is supposed to jump-start the weight-loss biochemical activity of the diet. Later, the carbohydrate allowance is increased in the form of fiber-rich foods, there is not return to eating refined sugar (by the teaspoonful or in desserts), milk, white rice, white bread, white potatoes or pasta made with white flour. The diet does allow for adding fruits, vegetables, and whole-grain foods after the two-week induction period. [6]

Then, over time, the transition from weight loss to weight maintenance is made by gradually increasing carbohydrate so long as gradual weight loss is maintained.

Exercise in all phases as part of a healthy lifestyle is now emphasized more than when the diet was first introduced. [1]

As evident from Table 1, 2 and 3 a combined effect of exercise plus Atkins diet resulted in a higher amount of weight loss as compared to modified Atkins diet alone, presumably

because they had a synergistic effect. This effect is evident both in short term (3 months) and intermediate term studies (6 months).

There is however substantial controversy regarding the Atkins Diet and even disagreements in interpreting the results of specific studies it is difficult to objectively summarize the research in a way that reflects scientific consensus [7,8]. Although there has been some research done throughout the twentieth century [9,10] most directly relevant scientific studies, both those that directly analyze the Atkins Diet and those that analyze similar diets, have occurred in the 1990s and early 2000s and, as such, are relatively new. Researchers and other experts have published articles and studies that run the gamut from promoting the safety and efficacy of the diet [11,12] to questioning its long-term validity [13] to outright condemning it as dangerous [14]. Until recently a significant criticism of the Atkins Diet was that there were no studies that evaluated the effects of Atkins beyond a few months. However, studies are emerging which evaluate low-carbohydrate diets over much longer periods, controlled studies as long as two years and survey studies as long as two decades [2,15].

CONCLUSION

Our study showed modified Atkins diet was effective in weight reduction both in short term and intermediate term studies. The effect of exercise along with modified Atkins diet had an additive effect and resulted in greater weight loss than Atkin's diet alone.

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