**Effects of low carbohydrate diet compared to low fat diet on reversing the metabolic**

**syndrome, using NCEP ATP III criteria: a randomized clinical trial**

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**Abstract:**

**Introduction**: The purpose of this study is to compare the change in the metabolic syndrome prevalence and risk

factors between participants who followed a low carbohydrate diet and those who followed a low fat diet for six

months in Erbil city/ Iraqi Kurdistan.

**Methods**: Out of 289 apparently healthy obese adults who were chosen by a stratified multistage probability

sampling method, 94 of them agreed to participate in the study. They were assigned to low carbohydrate and low

fat diet groups. Both groups were followed up for 6 months and the data were taken at baseline, after 3 months

and after 6 months of intervention. Ninety-four obese adults completed the intervention. One-way repeated

measures ANOVA was used to compare differences of metabolic dependent variables between the two

independent variables, the low carbohydrate and low-fat diet, at baseline, after 3 months and after 6 months of

intervention.

**Results**: The Participants in low carbohydrate diet group had greater decrease in the prevalence of MetS. At the

baseline, according to the ATP III criteria, the prevalence of metabolic syndrome was 44.4% (24/54) in low

carbohydrate diet group and 60% (24/40) in low fat diet group. The prevalence of MetS was decreased significantly

to 16.7% (9/54) after 3 months and to 3.7% (2/54) after 6 months in low carbohydrate diet (p < 0.001). Moreover, the

prevalence of MetS was decreased significantly to 32.5 (13/40) after 3 months and to 22.5% (9/40) after 6 months in

low fat diet (p < 0.001). No statistically significant difference was found between low carbohydrate diet & low fat

diet at the baseline (p-value = 0.136) and after 3 months and after 6 months of intervention.

**Conclusions**: Both low carbohydrate diet and low-fat diet have significant effects on reducing the prevalence of

MetS in obese adults when followed up for 6 months. Compared to low fat diet, low carbohydrate diet had greater

effect in reducing the prevalence of metabolic syndrome. Both diet programs were found to be effective in

improving the metabolic state of obese adults.

**Trial registration**: The trial is registered retrospectively at the US National Institutes of Health (ClinicalTrials.gov).

The registration in the US National Institutes of Health was done in 23/12/2020 with the registration number:

NCT04681924.

**Keywords**: Metabolic syndrome, Reversing, Low carbohydrate diet, Low fat diet, NCEP ATP III, Erbil, Iraq

**Biography of presenting author** (should not exceed 100 words)

Dr. Sherzad Ali Ismael, studied Medicine at the University of Salahaddin, Erbil-Iraq and graduated in 1995 with MBChB in Medicine & General Surgery. He then joined the fellowship of Iraqi Board for Medical Specialties/ Community Medicine. He received his Board certification in Community Medicine in 2007. After his research experience in Public Health, especially, he obtained the position of Assistant Professor at the Public Health Department as the head of the department. He has published many research articles in national and international medical journals.

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