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Comparison of paleo diets pormulated from foods available in Jaffna with modern diets on plasma glucose and serum insulin levels

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Background: The 'paleo diets' are based on the types of food presumed to have been eaten by early humans consisting chiefly of meat, fish, vegetables, and fruits excluding dairy or cereal products and processed food. If the entire survival of the mankind considered, Paleo diet has been evolved for about 80% of the existence of human being. The nutrient content of the Paleolithic diet had a ratio of carbohydrate: protein: fat as 45:34:21. This research was mainly conducted to compare the effects of two types of Paleo diets formulated from foods available in Jaffna with modern diet on plasma glucose and insulin levels.

Methodology: This was a laboratory based experimental study with Complete Randomized Design and it was conducted on 24 healthy adults. The selected 24 healthy adults were divided into four groups each consisting of 6 members to administer the different diets. Paleo Diet-1 was prepared from mutton (150g), sweet potato (150g), egg white (100g) and wood apple (100g) while Paleo diet-2 was prepared from fish (150g), sweet potato (150g), egg white (100g), cashew nut (25g) and wood apple (100g). Modern Diet-1 contained bread (150g) with 'sambol' (50g) and Modern Diet-2 contained bread (150g) with margarine (10g) and Milo drink (200ml). Blood samples were collected after fourteen hours of fasting and after the administration of the respective diets, in half an hour intervals for two hours and plasma glucose level and insulin level were measured by standard methods. Approval of Ethical Review Committee, Faculty of Medicine, University of Jaffna was obtained. The collected data were analysed using SPSS software.

Results and Discussions: Total calorific values of the Paleo diet- 1,Paleo diet- 2, Modern diet-1 and Modern diet-2 were 518.7, 503.0**,** 542.4and 536.2Kcal respectively. The mean BMI of the subjects was 22.1 (±1.1) kg/m^2 and those of the males and the females were 22.5 (±2.1) and 21.4 (±0.3) kg/m^2 respectively. The mean fasting plasma glucose and serum insulin levels of the subjects were 83.8 (±5.61) g/dl and 7.4(±6.0)µIU/mlrespectively.The plasma glucose levels of those who have consumed Paleo Diet-1 [123.0 (±21.23) mg/dl] reached the highest value at 1h while those who had the Paleo Diet-2 reached at 0.5h [120.3 (±12.95) mg/dl]. On the other hand the plasma glucose levels of those who have consumed Modern Diet-1 [114.7 (±12.64) and 111.0 (±17.92) mg/dl] and Modern Diet-2 [97.73 (±6.1) and 96.2 (±14.46) mg/dl] had almost same levels of plasma glucose at 0.5 and 1.0h. When the Paleo Diet 1 and 2 were consumed the reduction of blood glucose levels from 1h to 2h were 19.36 and 34.20 mg/dl respectively while when Modern Diet 1 and 2 were consumed the reduction were from 1h to 2h were 6.66 and 4.2 mg/dl respectively. The serum insulin levels of those who have consumed Paleo Diet-1 [73.3 (±20.81)µIU/ml] reached the highest value at 1h while those who had the Paleo

Diet-2 reached at 0.5h [100.1 (±41.86)μIU/ml] and remained the same at 1h [100.8 (±29.72)μIU/ml]. On the other hand the serum insulin levels of those who have consumed Modern Diet-1 [144.4 (±56.32)μIU/ml] and Modern Diet-2 [170.7 (±51.37)μIU/ml] had highest serum insulin levels at 1.0h. When the Paleo Diet 1 and 2 were consumed the reduction of plasma levels from 1 to 2h were 54.3 and 71.7μIU/ml respectively while when Modern Diet 1 and 2 were consumed the reduction of plasma glucose levels from 1 to 2h were 89.5 and 94.7 μIU/ml respectively. The area under the curve for serum insulin for Modern diet -2 was the highest [258.8(±22.6)] followed with Modern diet -1(210.5 ±59.3), Paleo diet -2 (137.2 ±48.3) and Paleo diet -1 [92.2 (±12.4)].

Conclusion: The Subjects who consumed the Paleo Diets 1 and 2 ended up with normal blood glucose levels less than 95mg/dl thanthose who consumed the Modern Diets -1 and 2 (above 100 mg/dl) at 2h. Those who consumedPaleo Dietshad less area under the curves for insulin than those who consumed Modern Diets - 1 and 2. Major difference between the Paleo - and Modern Diets formulated for this research were the protein contents and method of cooking. Therefore the study emphasises the importance of including the proteins to the diets as well as the inclusion of the crude carbohydrates rather than the refined carbohydrates (which were in the bread).

Keywords: Pale diet, Modern Diet, Area under the curve,