To Study the Effect of Diet Supplementation with Coconut Oil, Mustard Oil and Sunflower Oil on Blood Lipids in Rabbit

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This refers to the paper entitled “Comparison of Lipid Profile and Antioxidant Enzymes among South Indian Men Consuming Coconut Oil and Sunflower Oil” which appeared in the 2009 issue of Indian Journal of Clinical Biochemistry volume 24(1) pages 76–81, wherein the authors, Sabitha et al [4] had compared the lipid profile and antioxidant enzymes of normal and diabetic subjects consuming two different oils namely, coconut oil and sunflower oil as cooking medium. The authors had concluded in their study that the lipid profile and oxidative stress were deranged and raised in Type 2 diabetic subjects as compared to that in controls, though no significant and perceptible change could be appreciated in various blood lipids and oxidative status in the pre-designated subgroups consuming coconut oil and sunflower oil.

As an extension to the above quoted study, we would like to underscore the results of our experimental research protocol that was undertaken to evaluate the effect of various cooking medium oils namely, coconut oil, mustard oil, and sunflower oil per se and a mixture of mustard and sunflower oil on blood lipids in forty apparently healthy adult rabbits, keeping in view the predominant metabolic effects of blood lipids on cardiovascular dynamics besides

other systems physiology [3]. The experimental design was divided into four groups of ten animals in each group, with each group given the desired oil supplemented (daily intake of 5 ml for 4 weeks) in their diet. Base line data before oil feeding served as control. Normal values of serum lipids of rabbits for the present study were established. Serum lipids of all forty animals were estimated after 1 month oil supplementation of the study (Table 1). Coconut oil supplementation significantly increased High Density Lipoproteins-Cholesterol (HDL-C) levels (by about 14% of the basal control values) though other lipoproteins levels in blood namely, Total Cholesterol (TC), Triglycerides (TG), Low Density Lipoproteins-Cholesterol (LDL-C), Very Low Density Lipoproteins-Cholesterol (VLDL-C) also registered an increased levels, offsetting the advantage of a raised HDL-C to the dynamics of systems physiology. Ambiguous and ambivalent results were appreciated in blood lipid levels in the other groups on pure oil supplementation of sunflower and mustard oils, respectively. However, encouraging and favorable results in blood lipid levels were observed in the group on mixed oil supplementation. It gave better results as it contains both essential fatty acids omega-3 linolenic acid and omega-6 linoleic acid [1, 2]. It significantly decreased total cholesterol by 14%, TG by 27%, LDL by 18% and VLDL by 27.20%, though only slight decrease in HDL-C levels of 3% was observed.

Relevant and pregnant implications can be deduced from the present study, wherein pertinent changes in life-style need to be incorporated to achieve blood lipid levels beneficial for various organ systems. Supplemental fats, unsaturated, including mono unsaturated and poly unsaturated and saturated fats, in the right ratio(s) have the capability to influence the blood lipids levels significantly and it would indeed be interesting and worthwhile to

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Table 1 Effect of diet supplementation with coconut oil, mustard oil, sunflower oil and mixed (mustard and sunflower oil) on blood lipids (values are mean $\pm$ SD)

Test	N	T.C. (mg/dl)	T.G. (mg/dl)	HDL-C (mg/dl)	LDL-C (mg/dl)	VLDL-C (mg/dl)	LDL/HDL	T.C./HDL
Before oil supplementation (control Group)	40	42.48 $\pm$ 5.31	56.58 $\pm$ 6.85	15.90 $\pm$ 1.64	15.24 $\pm$ 4.78	11.33 $\pm$ 1.36	0.92 $\pm$ 0.35	2.6 $\pm$ 0.43
After oil supplementation Group 1 (mustard oil)	10	38.65 $\pm$ 3.58*	58.61 $\pm$ 6.47	15 $\pm$ 1.51	11.80 $\pm$ 4.42*	11.72 $\pm$ 1.29	0.81 $\pm$ 0.35*	2.60 $\pm$ 0.43
Group 2 (coconut oil)	10	49.22 $\pm$ 2.06*	66.90 $\pm$ 7.21*	17.60 $\pm$ 1.30*	18.02 $\pm$ 5.51	13.39 $\pm$ 1.44*	1.03 $\pm$ 0.34	2.79 $\pm$ 0.44
Group 3 (sunflower oil)	10	35.29 $\pm$ 4.0	50.66 $\pm$ 6.73	14.19 $\pm$ 1.59*	10.96 $\pm$ 4.59*	10.13 $\pm$ 1.34	0.77 $\pm$ 0.33	2.50 $\pm$ 0.41
Group 4 (mixed mustard and sunflower oil)	10	36.08 $\pm$ 5.26	41.21 $\pm$ 5.20*	16.44 $\pm$ 1.58	11.30 $\pm$ 5.56	8.24 $\pm$ 1.04*	0.69 $\pm$ 0.37	2.20 $\pm$ 0.37

* $P < 0.5$ and significant

evaluate and explore the optimal ratio of type(s) of fat to be included in the diet that best suits the various age-groups in humans!

References

1. Benson MK. Influence of omega-6/3 rich dietary oils on lipid profile and antioxidant enzymes in normal and stressed rats. *Indian J Exp Biol.* 2009;47:98–103.
2. Holub DJ, Holub BJ. Omega-3 fatty acids from fish oils and cardiovascular disease. *Mol Cell Biochem.* 2004;263:217–25.
3. Hu FB, Stampfer MJ, Manson JE, Rimm E, Colditz GA, Rosner BA, Hennekens CH, Willett WC. Dietary fat intake and the risk of coronary heart disease in women. *N Engl J Med.* 1997;337:1491–9.
4. Sabitha P, Vaidyanathan K, Vasudevan DM, Kamath P. Comparison of lipid profile and antioxidant enzymes among South Indian men consuming coconut oil and sunflower oil. *Indian J Clin Biochem.* 2009;24(1):76–81.