



# Dietary Nutrient and Fat Consumption Pattern of Patients Suffering from Myocardial Infarction (MI) in Comparison to the Adults with no Myocardial Infraction (NMI)

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## Research Paper—Food & Nutrition

**1. Introduction :** Cardiovascular disease (CVD), strokes and other circulatory diseases are the major killer diseases in human beings. CVD accounts for about 950,000 deaths annually (about 41 percent of total mortality form all causes). In 1998, India recorded 1.8 million heart attacks; a 50-percent increase from 1991 and without widespread dietary improvements, India's heart disease death toll will double by 2015 (Esselstyn C. et al., 2001). Increase consumption of fruits, vegetables and legumes, grains, nuts and n-3 fatty acids might be associated with a decreased risk of CAD and death attributable to coronary disease.

The incidence of diseases was found minimum in the groundnut oil consuming subjects and maximum in the coconut oil consuming subjects. It was found out that plant oils consumption up to 30 to 50 gm per day does not produce adverse effects in the serum lipid levels, BMI. Gingili oil and groundnut oil were found to be good in maintaining serum lipid levels and in reducing incidence of disorder Vasanthamani G. Vijayalaxshmi R. and Easwaran P. P. (2000). Looking the importance of the types of fats in prevention and cure of the Myocardial Infarction (MI) in this study the fat consumption pattern of the MI subjects were compared with their normal counterparts (NMI) to find out association of the types of fats with the disease.

**2. Materials and Methods:-** The study was preceded with the selection of the 100 adults of 30 – 60 year aged patients suffering from Myocardial Infraction by purposive sampling method. The subjects, those who had medical records of the disease were selected for this purpose from Charak Hospital Indore and 50 adults having no medically diag-

nosed CVDs (NMI) of the same age group were also selected randomly for the study who were visited the hospital to attend or meet the patients. An information schedule was formed for data collection. The information regarding the types and amount of visible and invisible fats consumed by them was found out through a Food Inventory Survey wherein the amount of the purchase of ghee, butter and oil per month was found out from the subjects. The total of amount so obtained was distributed into consumption unit according to the sex and activity level of the subject as suggested by Gopalan C. (1989).

The different types of fatty acid intake were calculated using food composition table suggested by Gopalan C. (1989), Ghafoorunissa (1989), Ghafoorunissa and Jyotsna, P., (1993). Required statistical analysis was done to make inferences.

**3. Results and Discussion: -** The results of Table No.1 indicated that the mean difference the amount of fats consumption by MI and NMI adults was not significantly different statistically. The Mean (SD) dietary total fats intake by NMI and MI adults was obtained as fat 51.61, (20.02) gm and 52.92, (22.33) gm per day. So it clear that MI adults had not significantly higher consumption of fats. The table further shows that mean intake of Protein 39.52, (12.58) gm and 39.29 (15.82) gm, Carbohydrates 223.26, (62.12) gm and 244.70, (69.22) gm, with total energy 1599, (422.02) kcal and 1691, (497.64) kcal per day respectively of NMI and MI adults Table No.2 reveals that the mean difference in any of the different types of fatty acid consumption by MI and NMI adults was found not signifi-

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cant as per obtained t values. Moreover, the table indicates that the Mean (SD) intake of different types of fatty acid intake by NMI and MI adults was obtained respectively as n-3 in 2.55, (6.05) gm and 2.08, (6.05) gm, n-6 in 17.63, (10)gm and 17.93, (9.85)gm, PUFA in 19.71, (10.73)gm and 20.45, (11.45)gm, MUFA in 17.10, (7.47)gm and 17.08, (8.67)gm, total unsaturated fatty acids in 36.82, (15.59)gm and 37.57, (17.33)gm, saturated fatty acids in 14.79, (7.47)gm and 15.34, (8.67)gm, amounts/day. Table No.3 indicates that the mean difference in the consumption pattern of fatty acid ratios of MI and NMI adults was found not significantly different as per obtained t values, Moreover the Mean (SD) dietary intake of different fatty acid ratio of NMI and MI adults was found as n-6/n-3 fatty acid ratio 13.56, (13.21) and 12.80, (10.15), MUFA/Saturated fatty acid 1.27, (0.66) and 1.33, (0.67), PUFA/Saturated fatty acid 1.50, (0.76) and 1.67, (1.19), Unsaturated/Saturated fatty acid 15.19, (7.1) and 15.49, (8.8) poly unsaturated/Saturated fatty acid 1.49, (0.80) and 1.70, (1.20) per day respectively. According to (World Health Organization, 2003) among several factors, related to lifestyle habits that could influence cardiovascular risk, the beneficial effect of diet has already been underlined frequently in many past and recent research studies. During the last decades there is an increase of scientific evidence that there are protective health effects from diets, which are high in fruits, vegetables, legumes and whole grains and which includes fish, nuts and low-fat dairy products. Such diets need not to be restricted in total lipid intake fat as long as excess of energy intake over expenditure calories. It emphasized predominantly vegetable oils those are low in saturated fats and partially hydrogenated oils.

Analysis of the results of table no 1 revealed that the NMI adults were found taking more carbohydrates and energy than MI adults who were found taking more fats in comparison to former. However, the mean difference in protein intake was almost negligible. (Refer figure- 1). The Diet, Nutrition and the Prevention of Chronic Diseases report of the (World Health Organization, (2003) recommend that 55% to 60% of the daily caloric intake should be obtained from carbohydrates. Forty-five to fifty percent of these calories should come from complex carbohydrates and natural sugars found in fresh fruits and vegetables and no more than 10% from refined and processed sugars. Nevertheless, the consumption of carbohydrates in people with the metabolic syndrome remains controversial and needs further investigation. The table no. 2 showed comparative fatty acid composition of the diets of the MI and NMI adults. It is clear from these data that barring MUFA and n-3 fatty acids, MI adults have had lower intakes of remaining all other fatty acids than that of the NMI adults. (Refer figure- 2) There are two types of dietary fats: a) saturated and b) unsaturated. The unsaturated fats are further divided into

the monounsaturated and polyunsaturated fats. Usually, the daily energy intakes consists 30% of fat, but no more than 10% of these calories should come from saturated (animal fats). The rest 20% should come from unsaturated (vegetable) oils. However, whatever the fat intakes, certain oils must be included in the diet, like the essential fatty acids. They are polyunsaturated fats derived mostly from vegetable oils such as safflower oil, corn oil, olive oil and soyabean oil. Lack of these oils in one's diet will cause series illness.

Not only are the types of fatty acids important, it is also equally important to take these fatty acids in proper proportions. So, there relative proportions (ratio) have also been computed and presented in table -3. It clears from the data (Refer figure- 3) that NMI group had exceeded in taking n-6/n-3 ratio than MI group.

Results from different studies indicated that the dietary content of (n-3) and (n-6) PUFAs significantly altered the levels of these lipids in plasma and cardiac tissue. In a study the 2 diets dramatically modulated the PUFA composition of plasma and cardiac tissue, with (n-6):(n-3) ratios of 8.0 in plasma and 11.8 in heart of rats fed the high (n-6) PUFA diet and ratios of 0.6 and 0.9 in plasma and heart respectively of rats being fed on high (n-3) PUFA diet. In rats after experimental MI, a diet high in (n-3) PUFAs significantly prolonged survival in rats after MI. The (n-3) diet was found associated with a 37% relative increase in survival. (Gary P. et al., 2006). Mortality was found reduced in randomized, controlled clinical trials performed to evaluate the potential cardiovascular benefits from dietary (n-3) PUFAs in the Diet and Re-infarction Trial (DART) (Burr M. L. et al., 1989) and (De Lorgeril et al., 1994) Fish oil supplements decreased mortality in the Indian Experiment of Infarct Survival trial (Singh R. B. et al., 1997), (Gruppo Italiano, 1999) and (Leaf et al., 2005) The primary decrease in mortality resulted from a decrease in sudden deaths (Marchioli R. et al., 2002) In support of the decrease in sudden death, (n-3) PUFAs were shown to decrease the incidence of arrhythmias in experimental models. (Mc Lennan P. L. et al., 1993) In contrast, a number of prospective randomized controlled trials found no cardiovascular benefits from increased dietary intake of (n-3) PUFAs using fish oils after MI (Nilsen D. W. et al., 2001) or implantation of cardioverter/defibrillators (Raitt M. H. et al., 2005) or by -linolenic acid (Natvig H. et al., 1968). Thus, further studies are being warranted to confirm the beneficial cardiovascular effects of (n-3) PUFAs. So, to conclude the composition of diet taken seems important in the etiopathogenesis of the myocardial infarction but the can not be claimed solely responsible for it. Precipitation of cardiovascular disorders is the composite effect of many life style factors other than the diet.

**Table -1**  
Comparative proximate nutrients intake of adults suffering from Myocardial Infarction and with Non Myocardial Infarction (Mean, SD and 't' value)

Variables	Value	Groups		Mean Difference	t	Sig.
		NMI (N = 50)	MI (N = 100)			
Total Fat (gm)	Mean	51.61	52.92	1.30	.34	.72
	SD	20.02	22.33			
Protein (gm)	Mean	39.29	39.52	.23	.09	.92
	SD	15.82	12.58			
Carbohydrates (gm)	Mean	244.70	223.26	21.43	1.91	.05
	SD	69.22	62.12			
Total Energy (Kcal)	Mean	1691	1599	91.69	1.18	.24
	SD	497.64	422.02			

**Table - 2**  
Comparative different types of fatty acid intake of adults suffering from Myocardial Infarction and with Non Myocardial Infarction (Mean, SD and 't' value)

Variables	Value	Groups		Mean difference	t	Sig.
		NMI (N = 50)	MI (N = 100)			
n-3 (gm)	Mean	2.55	2.08	.47	.54	.24
	SD	6.05	1.59			
n-6 (gm)	Mean	17.63	17.93	.30	.17	.58
	SD	10.00	9.85			
PUFA (gm)	Mean	19.71	20.49	.78	.40	.85
	SD	10.73	11.45			
MUFA (gm)	Mean	17.10	17.08	2.79	.02	.98
	SD	7.47	8.67			
Total Unsaturated (gm)	Mean	36.82	37.57	.75	.25	.79
	SD	13.59	17.33			
Saturated (gm)	Mean	14.79	15.34	.55	.38	.70
	SD	7.47	8.67			

**Table - 3**  
Comparative dietary fatty acid ratio intake of adults suffering from Myocardial Infarction and with Non Myocardial Infarction (Mean, SD and 't' value)

Variables	Value	Groups		Mean Difference	t	Sig.
		NMI (N = 50)	MI (N = 100)			
n-6 / n-3 Ratio	Mean	13.56	12.81	.75	.33	.74
	SD	12.80	10.15			
MUFA / SAT.	Mean	1.27	1.33	-.06	-.45	.65
	SD	0.66	0.67			
PUFA / SAT.	Mean	1.50	1.67	-.17	-.74	.45
	SD	0.76	1.19			
UN SAT. / SAT	Mean	13.19	15.49	-.30	-.17	.86
	SD	7.1	8.8			
PUFA / MUFA	Mean	1.49	1.70	.20	1.25	.68
	SD	0.80	1.20			

FIGURE – 1

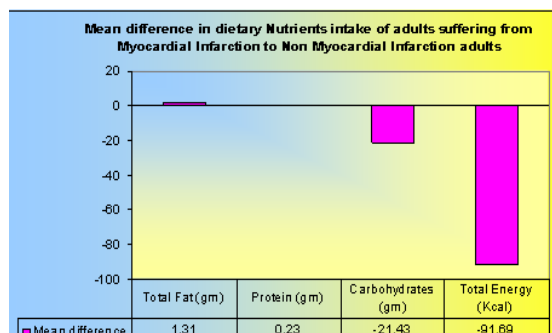


FIGURE – 2

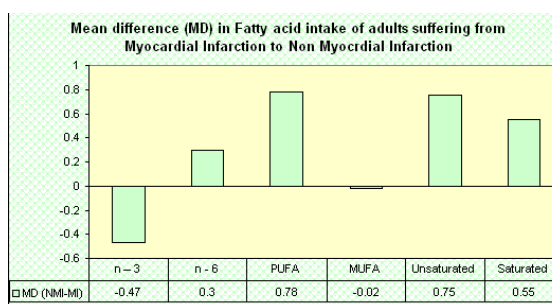
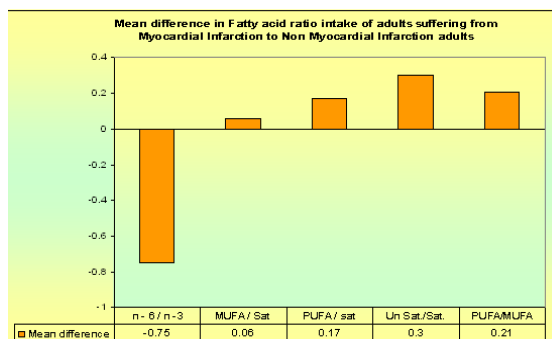


FIGURE – 3



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