Relationship between platelet phospholipid polyunsaturated fatty acids and dietary intake of fish, meat and polyunsaturated fat in male Melbourne Chinese and Caucasian

D Li[1], H Zhang[2], BHH Hsu-Hage[3], ML Wahlqvist[4], AJ Sinclair[1]

[1]*Department of Food Science, RMIT University, Melbourne, VIC 3000, Australia*
[2]*Primary Health Branch, Department of Human Service, Melbourne, VIC 3000, Australia*
[3]*Department of Rural Health, The University of Melbourne, Shepparton 3632, VIC, Australia*
[4]*International Health & Development Unit and Asia Pacific Health & Nutrition Centre, Monash University, Clayton 3168, VIC, Australia*

Increased n-3 polyunsaturated fatty acid (PUFA) in the tissues is associated with decreased risk of cardiovascular disease (1). The aims of this study were to investigate (1) platelet phospholipid (PL) polyunsaturated fatty acid (PUFA) composition in subjects who were the Melbourne Chinese migrants compared with those who were the Melbourne Caucasians, (2) the relationship between platelet PL PUFA and intake of fish, meat and PUFA. Ninety-seven Melbourne Chinese males aged between 25 to 55 years and 78 age and sex matched Caucasians were recruited in Melbourne. Dietary intake was assessed using a semi-quantitative Food Frequency Questionnaire. The platelet PUFA was measured by gas liquid chromatography.

The Melbourne Chinese had a significantly higher intake of fish ($p = 0.012$) and white meat ($p = 0.0045$) compared with the Melbourne Caucasians and had significantly higher proportions of platelet PL 20:5n-3 ($p = 0.006$), 22:6n-3 ($p < 0.0001$), total n-3 ($p = 0.027$) and 22:5n-6 ($p = 0.0002$). The Melbourne Chinese had a significantly lower intake of red and total meat ($p < 0.0001$) than the Melbourne Caucasians, and significantly lower proportions of 20:3n-6 ($p = 0.023$), 20:4n-6 ($p < 0.002$), 22:4n-6 ($p < 0.0001$), total n-6 ($p = 0.037$), 22:5n-3 ($p < 0.0001$) and ratio of n-6/n-3 ($p = 0.011$).

	Fish (g/day)		Meat (g/day)		PUFA (g/day)	
	Std. Coeff.	*P* value	Std. Coeff.	*P* value	Std. Coeff.	*P* value
18:2n-6	0.001	0.968	–0.146	0.135	0.128	0.190
20:3n-6	0.030	0.701	–0.172	0.070	0.312	0.001
20:4n-6	–0.032	0.691	0.026	0.787	0.044	0.652
22:4n-6	–0.125	0.114	–0.076	0.424	0.242	0.012
22:5n-6	0.034	0.664	< 0.0001	0.993	–0.311	0.039
22:5n-3	–0.235	0.002	0.146	0.104	0.218	0.016
22:6n-3	0.211	0.003	–0.064	0.446	–0.415	< 0.0001
22:6n-3/22:5n-3	0.277	< 0.0001	–0.126	0.105	–0.448	< 0.0001

Multiple linear regression result (Table) indicated that platelet PL 20:5n-3 and 22:6n-3 were positively correlated with fish intake, and negatively correlated with dietary intake of meat and PUFA, while 22:5n-3 was positively correlated with dietary meat and PUFA intake, and negatively correlated with fish intake. Dietary intake of PUFA and fish are potential confounding factors for assessing the effects of meat consumption on platelet PL individual PUFA. Dietary intake of PUFA and meat did not influence the incorporation of fish long chain n-3 PUFA into platelet PL in this study population.

1. Kinsella JE, Lokesh B, Stone RA. Dietary n-3 polyunsaturated fatty acids and amelioration of cardiovascular disease: possible mechanisms. Am J Clin Nutr 1990; 52: 1–28.