Proceedings of the Nutrition Society (2008), **67 (OCE8)**, E361 doi:10.1017/S0029665108000359

Summer Meeting 30 June–3 July 2008

Comparison of *n*-3 and *n*-6 PUFA composition of erythrocyte membrane and of plasma NEFA between pregnant and non-pregnant adolescents

Flavia Meneses, Jacqueline G. Ney, Alexandre G. Torres and Nádia M. F. Trugo
Laboratório de Bioquímica Nutricional e de Alimentos, Instituto de Química, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

When pregnancy occurs during adolescence the specific metabolic changes of gestation[1] are superimposed on those characteristic of adolescence[2], and the combination of both periods might further affect adipose tissue[3], and possibly fatty acid metabolism. The objective of the present study was to evaluate the influence of pregnancy in adolescents on the composition of plasma NEFA, as a proxy for fatty acids mobilized from adipose tissue, and of erythrocyte membrane (EM) fatty acids, as a proxy for maternal status of essential fatty acids (EFA) and long-chain (LC) PUFA. Two groups of healthy adolescents (age 14–19 years), matched according to age, habitual diets and general socio-economic backgrounds, from Rio de Janeiro, Brazil were compared: non-pregnant (NP; *n* 20); pregnant (P; *n* 26; 32.7 (SD 3.9) weeks of gestation). Blood samples were collected after overnight fasting. Fatty acid composition of NEFA and EM were determined by GC. EM fatty acid composition was used to calculate indices of fatty acid status as follows: EFA status index ($[\Sigma\, n\text{–}3 + \Sigma\, n\text{–}6]/[\Sigma\, n\text{–}7 + \Sigma\, n\text{–}9]$; EFASTI); DHA status indices, 22:5*n*–6/22:4*n*–6 and 22:6*n*–3/22:5*n*–6). Dietary intake of *n*–3 PUFA was similar and below the current recommendations[4] in both groups, especially in group P. Total plasma NEFA was higher ($P<0.001$) in group P (1300 (SD 144) μmol/l) than in group NP (623 (SD 15) μmol/l), as a result of a higher mobilization of fatty acids from adipose tissue after fasting. Contents of NEFA 18:2*n*-6 and 20:4*n*-6 were higher in group P than in NP (Table). However, EM 20:4*n*-6, total *n*-6 and total PUFA were lower ($P<0.05$) in group P. NEFA and EM fatty acid compositions were not associated with BMI, age, age at menarche, period (years) post menarche and weeks of gestation. The EFA status and the DHA status for group P were similar to the values for group NP (Table) and of Brazilian pregnant adults[5], but DHA status was lower than that of pregnant adults from The Netherlands[6].

Table. Plasma NEFA and EM composition (g/100 g) and status indices for groups P (*n* 26) and NP (*n* 20)

	NEFA				EM			
	NP		P		NP		P	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
18:2*n*-6	25.1	3.6	31.6*	9.7	9.9	2.2	9.7	1.9
18:3*n*-6	1.0	1.1	1.7*	1.1	–		–	
20:3*n*-6	0.5	0.3	0.7	0.4	1.2	0.4	1.4	0.4
20:4*n*-6	1.9	1.2	3.0*	1.0	13.6	1.4	10.9*	2.1
22:4*n*-6	–		–		2.8	0.5	2.5	0.7
22:5*n*-6	–		–		0.9	0.7	0.8	0.3
18:3*n*-3	1.0	0.5	0.9	0.6	–		–	
20:5*n*-3	–		–		0.6	0.4	0.8	0.8
22:5*n*-3	–		–		1.5	0.3	1.4	0.6
22:6*n*-3	–		–		3.6	2.2	3.4	1.5
EFASTI	–		–		2.1	0.2	2.0	0.5
22:5*n*-6/22:4*n*-6	–		–		0.36	0.3	0.3	0.2
22:6*n*-3/22:5*n*-6	–		–		5.7	4.9	5.4	3.0

Values were significantly different from those for group NP (Student's *t* test): *$P<0.05$.

These findings are consistent with the dietary pattern of Brazilian women, with a relatively high intake of *n*-6 PUFA and low intake of preformed *n*-3 LC PUFA, especially DHA.

Supported by: CNPq, CAPES, and FAPERJ (Brasil). F.M. and J.G.N. were recipients of studentships, and N.M.F.T. of a fellowship from CNPq.

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