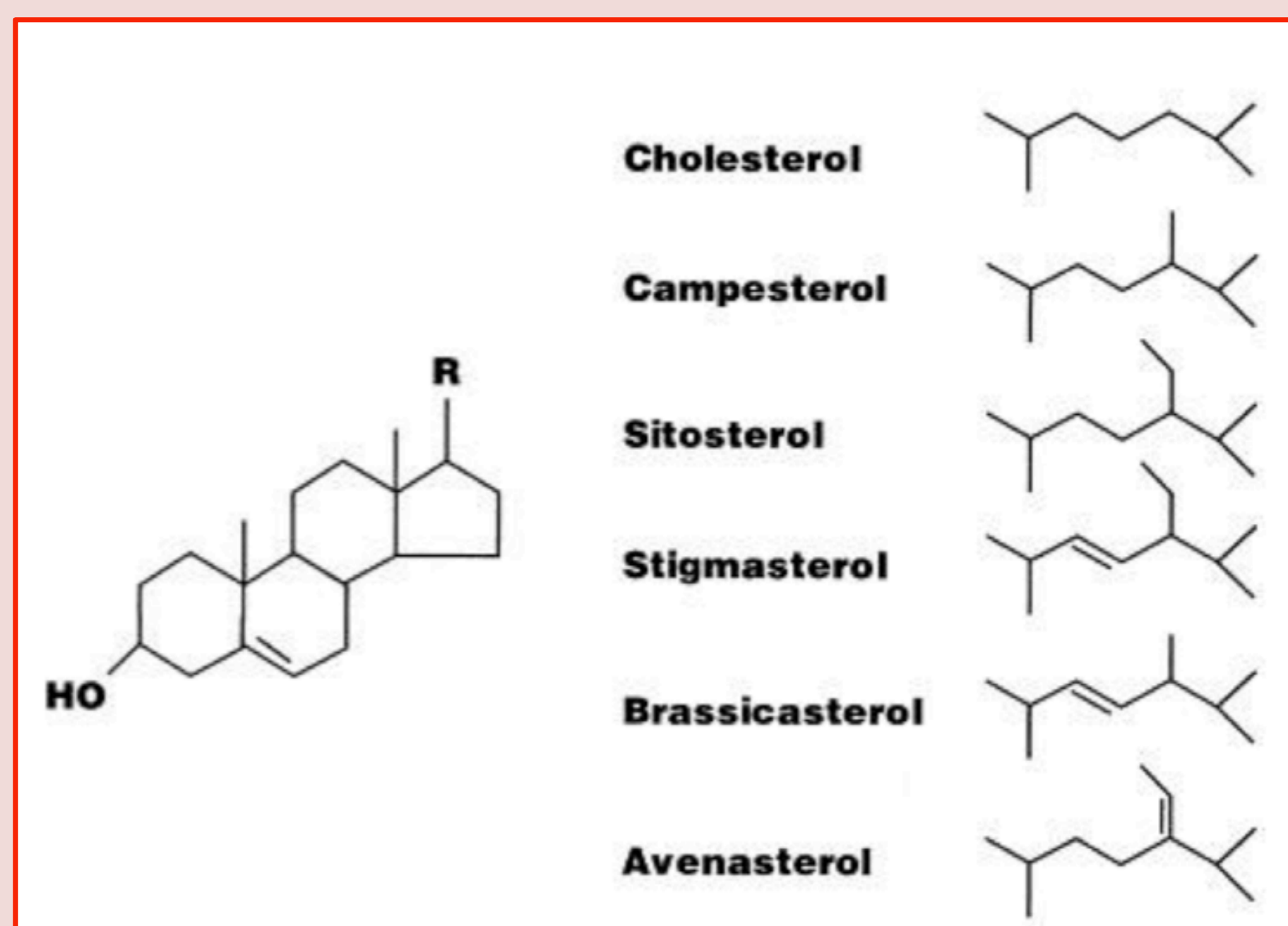


Sara Savini¹, Alessio Correani¹, Rita D'Ascenzo¹, Chiara Biagetti¹, A. Pompilio¹, Paola E. Cogo², M. Taus³, A. Nicolai³, Virgilio P. Carnielli¹

¹Division of Neonatology, Department of Clinical Sciences, Polytechnic University of Marche and Azienda Ospedaliero Universitaria Ospedali Riuniti, Ancona, Italy

²DMCCP (Dipartimento Medico Chirurgico di Cardiologia Pediatrica), Pediatric Hospital "Bambino Gesù", Rome, Italy

³Department Unit of Clinical Nutrition, Azienda Ospedaliero Universitaria Ospedali Riuniti, Ancona, Italy



INTRODUCTION

The lower cholesterol esterification performed by acyl-CoA cholesterol acyltransferase (ACAT) and lecithin cholesterol acyltransferase (LCAT) in preterm infants compared to adults and full-term infants is known. Recently, *Connor et al.* reported that these enzymes are able to esterify not only cholesterol but also phytosterols. Subjects on parenteral nutrition daily assume large amounts of these molecules, as they are ordinary components of lipid emulsions (LEs). We evaluated the liver ability to esterify phytosterols and cholesterol in preterm infants and adults on parenteral nutrition (PN) considering free and esterified sterols ratio.

MATERIALS AND METHODS

We measured free and esterified sterols (cholesterol, campesterol, stigmasterol and β -sitosterol) plasma levels in 82 preterm infants (500-1249 g birth weight) on routine PN (P-PN), 10 adults on PN (A-PN) and 6 adults on a free diet used as controls (A-Contr). Gas-chromatography mass-spectrometry (GC-MS) was used for measurements.

RESULTS

Plasma concentrations of free cholesterol (FC) and phytosterols (F-Phy) were significantly higher in P-PN than in A-PN. Esterified cholesterol (EC) and phytosterols (E-Phy) were significantly lower in P-PN than in A-PN. P-PN had a significantly higher F-Phy/E-Phy ratio than both the adult groups. Plasma F-Phy/E-Phy ratio was unchanged after 24 h on fat free PN both in preterm infants and in adults and it was not correlated with phytosterols intake in preterm infants. A statistically significant correlation between FC/EC and F-Phy/E-Phy was found.

DISCUSSION

We provided novel data on the markedly reduced phytosterols esterification in P-PN compared to A-PN. We demonstrated that plasma F-Phy were esterified to a lesser extent than cholesterol in both adults and P-PN and this was independent from the intravenous lipid intake. In addition we found that preterms able to well esterify cholesterol are also able to well esterify phytosterols. We believe that the higher F-Phy plasma level may have a role in the onset of PNAC and increase the risk of premature atherosclerosis.

Table 1. Plasma sterols concentrations (mg/L) and Free/Esterified ratio^{1,2}

Variable	P-PN (n=82)	A-PN (n=10)	A-Contr (n=6)	*P
Cholesterol	1546.1±398.3 ^a	1894.4±227.3 ^b	1967.1±151.7 ^b	0.00
FC	609.3±178.5 ^a	449.9±95.7 ^b	356.7±59.1 ^b	0.00
EC	936.8±278.3 ^a	1444.5±218.5 ^b	1610.3±171.2 ^b	0.00
FC/EC ratio	0.9±0.3^a	0.3±0.1^b	0.2±0.1^b	0.00
Campesterol	3.3±1.3 ^a	3.5±1.1 ^a	1.2±0.2 ^b	0.00
Free	1.9±0.8 ^a	1.2±0.2 ^b	0.5±0.2 ^b	0.00
Esterified	1.4±0.6 ^a	2.3±1.0 ^b	0.8±0.3 ^b	0.00
Free/Esterified ratio	1.3±0.5^a	0.6±0.2^b	0.7±0.5^b	0.00
Stigmasterol	4.3±1.8 ^a	3.5±1.1 ^{ab}	1.5±0.6 ^b	0.00
Free	3.4±1.5 ^a	1.8±0.6 ^b	0.7±0.2 ^b	0.00
Esterified	1.0±0.4 ^a	1.6±0.6 ^b	0.8±0.4 ^a	0.00
Free/Esterified ratio	3.6±0.7^a	1.2±0.4^b	0.9±0.3^b	0.00
β -sitosterol	7.8±2.8 ^a	8.9±4.4 ^a	1.7±0.3 ^b	0.00
Free	4.9±1.8 ^a	2.8±0.8 ^b	0.5±0.1 ^c	0.00
Esterified	2.9±1.2 ^a	6.5±3.6 ^b	1.3±0.2 ^a	0.00
Free/Esterified ratio	2.0±0.6^a	0.5±0.3^b	0.4±0.1^b	0.00
Phytosterols	15.4±5.4 ^a	16.2±6.2 ^a	4.4±0.2 ^b	0.00
F-Phy	10.2±3.8 ^a	5.8±1.5 ^b	1.6±0.3 ^c	0.00
E-Phy	5.2±1.9 ^a	10.4±4.9 ^b	2.8±0.4 ^a	0.00
Free/Esterified ratio	1.9±0.5^a	0.6±0.2^b	0.6±0.2^b	0.00

¹ P-PN: preterm infants on parenteral nutrition, A-PN: adults on parenteral nutrition, A-Contr: adults controls. ² Data are expressed as Mean±SD. Values of *P<0.05 by ANOVA were considered significant. Different superscripts indicate significant differences between groups by Bonferroni.



Di chi sara' il mondo di domani?
Di chi oggi canta in coro.

17 GIUGNO 2015
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