UMBILICAL ARTERIES APPEAR TO BE ESSENTIAL FATTY ACID DEFICIENT: ARE THERE NUTITIONAL IMPLICATIONS FOR THE FOETUS?

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Essential fatty acid deficiency (EFAD) is characterised by a decrease in the essential omega 6 polyunsaturates and a concommittant increase in omega 9 fatty acids. There have been reports of elevated levels of omega 9 fatty acids in the plasma of term infants and this has been interpreted as indicating that the EFA status of infants may be compromised at birth. Recently it was reported that the vessels carrying the blood from the foetus to the placenta (two arteries) contained increased levels of omega 9 fatty acids, particularly 20:3W9, compared with the umbilical vein in a study involving 5 cord samples (Homstra et al. 1989). The authors concluded that tissues of the foetus may be compromised by a lack of available EFA.

We have examined the blood cells, plasma and vascular tissue from the umbilical arteries and veins of 42 infants born at Flinders Medical Centre. The levels of fatty acids in the vascular tissue was compared with comparable tissue from SIDS infants. The levels of the major omega 9 and omega 6 fatty acids are listed in the table below.

FATTY ACID	UMBILICAL Vessels		SIDS Vessels	
	arteries n=42	veins n=42	arteries n=3	veins n=3
18:1w9	13.2	9.4	1.5	1.3
20:3w9	3.4	0.6	0.2	0.2
18:2w6	1.4	2.4	5.4	7.8
20:4w6	12.8	17.6	18.4	17.1
Triene:tetraene	0.26	0.03	0.01	0.01

Only the fatty acids found in the blood vessels were measurably different. Cord arteries were richer in omega 9 fatty acids including 20:3 and lower in omega 6 fatty acids than cord veins. These differences were not seen in femoral vessels taken from SIDS infants. As differences in fatty acids levels were not seen in erythrocyte membranes or plasma obtained from umbilical vessels it is concluded that the high omega 9 levels seen in umbilical arteries may be a peculiarity of this tissue rather than a result of nutritional deficiencies in the blood supply of umbilical arteries.

HOMSTRA,G., VAN HOUWELINGEN, K., SIMONIS, M. and GERRARD, J.M. (1989). Lipids 24: 511.

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