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Title: Fish Oil Supplementation Decreases Oxidative Stress but Does Not Affect Platelet-Activating Factor Bioactivity in Lungs of Asthmatic Rats
Author(s): Zanatta, AL (Zanatta, A. L.); Miranda, DTSZ (Miranda, D. T. S. Z.); Dias, BCL (Dias, B. C. L.); Campos, RM (Campos, R. M.); Massaro, MC (Massaro, M. C.); Michelotto, PV (Michelotto, P. V., Jr.); West, AL (West, A. L.); Miles, EA (Miles, E. A.); Calder, PC (Calder, P. C.); Nishiyama, A (Nishiyama, A.)
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Abstract: Dietary fish oil supplementation increases the content of n-3 polyunsaturated fatty acids (PUFA) in cellular membranes. The highly unsaturated nature of n-3 PUFA could result in an enhanced lipid peroxidation in the oxidative environment characteristic of asthma. The oxidative reaction cascade culminates in an increased production of components associated to oxidative stress and of an important proinflammatory mediator platelet-activating factor (PAF)-like lipid. We evaluated the effect of fish oil supplementation in asthmatic rats upon the PAF bioactivity and parameters related to oxidative stress in the lung. Fish oil supplementation of asthmatic rats resulted in lower concentrations of nitrite (1.719 +/- A 0.137 vs. 2.454 +/- A 0.163 nmol/mL) and lipid hydroperoxide (72.190 +/- A 7.327 vs. 120.200 +/- A 11.270 nmol/mg protein). In asthmatic animals, fish oil increased the activities of superoxide dismutase (EC 1.15.1.1) (33.910 +/- A 2.325 vs. 24.110 +/- A 0.618 U/mg protein) and glutathione peroxidase (EC 1.11.1.9) (164.100 +/- A 31.250 vs. 12.590 +/- A 5.234 U/mg protein). However, fish oil did not affect PAF bioactivity in lung tissue of asthmatic rats (0.545 +/- A 0.098 340/380 vs. 0.669 +/- A 0.101 340/380 nm ratio). Considering the two-step process-oxidative stress and PAF bioactivity-fish oil exhibited a divergent action on these aspects of asthmatic inflammation, since the supplement lowered oxidative stress in the lungs of asthmatic rats, presenting an antioxidant effect, but did not affect PAF bioactivity. This suggests a dual effect of fish oil on oxidative stress and inflammation in asthma.

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Addresses: [Zanatta, A. L.; Miranda, D. T. S. Z.; Dias, B. C. L.; Campos, R. M.; Massaro, M. C.; Nishiyama, A.] Univ Fed Parana, Dept Fisiol, Ctr Politecn, BR-81531990 Curitiba, Parana, Brazil.

[Michelotto, P. V., Jr.] Pontificia Univ Catolica Parana, Sch Agr Sci & Vet Med, BR-83010500 Bairro Costeira, Sao Jose Dos Pi, Brazil.

[West, A. L.; Miles, E. A.; Calder, P. C.] Univ Southampton, Southampton Gen Hosp MP887, Fac Med, Human Dev & Hlth Acad Unit, Southampton SO16 6YD, Hants, England.

[Calder, P. C.] Univ Southampton, Univ Hosp Southampton NHS Fdn Trust, NIHR Southampton Biomed Res Ctr, Southampton SO16 6YD, Hants, England.

[Calder, P. C.] King Abdulaziz Univ, Fac Sci, Dept Biol Sci, Jeddah, Saudi Arabia.

Reprint Address: Zanatta, AL (reprint author), Univ Fed Parana, Dept Fisiol, Ctr Politecn, BR-81531990 Curitiba, Parana, Brazil.

E-mail Addresses: analucia_zanatta@yahoo.com.br

Author Identifiers:

Author	ResearcherID Number	ORCID Number
Michelotto, Pedro	J-2180-2012	0000-0003-0893-1654
Calder, Philip	E-9739-2013	0000-0002-6038-710X
Miles, Elizabeth	O-1861-2015	0000-0002-8643-0655
Fac Sci, KAU, Biol Sci Dept	L-4228-2013	
Faculty of, Sciences, KAU	E-7305-2017	
West, Annette		0000-0002-3331-0684

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