Ramos-Romero et al. Journal of Translational Medicine 2010, 8(Suppl 1):P24
http://www.translational-medicine.com/content/8/S1/P24

JOURNAL OF TRANSLATIONAL MEDICINE

POSTER PRESENTATION Open Access

Modulation of oxidative stress and TNFα secretion by peritoneal macrophages of arthritic rats fed with a flavonoid-enriched diet

S Ramos-Romero, F J Pérez-Cano, C Ramírez-Santana, C Castellote, A Franch, M Castell*

From 5th European Workshop on Immune-Mediated Inflammatory Diseases
Sitges-Barcelona, Spain. 1-3 December 2010

Introduction

The inflammatory response increases the oxidative stress and cytokine production, such as TNFα, in macrophages. Flavonoids, present in vegetables, have potential antioxidant and anti-inflammatory properties. Previous studies have shown that a flavonoid-enriched cocoa extract added to macrophages *in vitro* decreases the secretion of NO and TNFα [1].

Aim

The objective of the present study was to ascertain the production of oxidant products and a pro-inflammatory cytokine (TNFα) by peritoneal macrophages obtained from arthritic rats after a long-term cocoa diet.

Methods

Female LOU rats were fed with a 10% cocoa diet or standard chow. After 2 weeks of diet, collagen-induced arthritis (CIA) was induced in part of animals from each group. One month later, peritoneal macrophages were obtained by injecting ice-cold sterile PBS into the peritoneal cavity. Cells were cultured and stimulated by addition of 1 μg/mL LPS. TNFα secretion was quantified by ELISA in 24 h supernatants. In the same samples, NO_2^- concentration (stable end product of NO) was measured by a modification of Griess reaction. To determine intracellular ROS production, macrophages were incubated with reduced 2',7'-dichlorofluorescein diacetate (H_2DCF-DA) for 30 min at 37 °C. Fluorescence of DCF oxidized by ROS was measured by fluorometry every 30 min up to 2 h.

Results

Macrophages from CIA animals fed cocoa decreased TNFα and NO production by ~57% and ~36% with respect to those from CIA reference group under LPS-stimulation conditions ($P<0.05$). ROS production by macrophages from CIA animals fed standard diet was higher with respect to healthy reference animals ($P<0.05$). Cocoa diet avoided ROS secretion increase in CIA animals ($P<0.05$), raising similar values to healthy animals.

Conclusion

A long-term cocoa diet reduced the production of oxidants and TNFα in peritoneal macrophages obtained from collagen-induced arthritic rats.

Published: 25 November 2010

Reference

1. Ramiro E, Franch A, Castellote C, Pérez-Cano FJ, Permanyer J, Izquierdo-Pulido M, Castell M: **Flavonoids from Theobroma cacao down-regulate inflammatory mediators.** *J Agric Food Chem* 2005, **53**:8506-8511.

doi:10.1186/1479-5876-8-S1-P24
Cite this article as: Ramos-Romero *et al.*: Modulation of oxidative stress and TNFα secretion by peritoneal macrophages of arthritic rats fed with a flavonoid-enriched diet. *Journal of Translational Medicine* 2010 **8**(Suppl 1):P24.

Dept. of Physiology, Faculty of Pharmacy, University of Barcelona, Spain