Polyphenol Enriched Cocoa Protects the Retinal Function in Experimental Model of Diabetes. An *in Vivo* and *in Vitro* Study.

Rosales, M.A.B.; Silva, K.C.; Faria, A.M.; Gurgueira, S.A.; Lopes de Faria, J.B.; Lopes de Faria, J.M.

Renal Pathophysiology Laboratory, Faculty of Medical Sciences, State University of Campinas (UNICAMP), Campinas, Sao Paulo, Brazil

It has been demonstrated that polyphenol compounds are protective against diabetic complications. The objective of this study was to investigate the effects of polyphenol enriched cocoa in neural retina and in outer blood retinal barrier (BRB) function in experimental diabetic retinopathy (DR) models. Diabetes (DM) was induced by streptozotocin in WKY rats with 10 weeks of age. The rats were divided into 4 groups: control (CT) and DM treated with polyphenol enriched cocoa (CC) and CT and DM treated with cocoa without polyphenol (placebo-PL) in a dose of 190 mg/kg by oral gavage daily for 16 weeks. To access the outer BRB function mechanisms, human retinal pigment epithelium cells line (ARPE-19) exposed to 30 mM high glucose (HG) in absence or presence of 100 ng/ml CC for 24 hours were conducted. The retinal function, evaluated by electroretinogram, showed a decrease in *b*-wave amplitude (pos-photoreceptor response) in PL-DM compared with PL-CT group accompanied by increase of the early neuronal marker of DR (GFAP) and inducible nitric oxide synthase (iNOS) expressions. The CC-DM group did not present the above abnormalities. The cells in HG, revealed a significant increasing in ROS production and the integrity of BRB, evaluated by expression of claudin-1, a tight junction protein, was decreased with decreased permeability to FICT-dextran. The treatment prevented all this dysfunction. The polyphenol enriched cocoa demonstrated a protective effect on DR models possible by maintaining the oxidative status. More studies are in progress to link neural, epithelial cells and the mechanism of cocoa in DR.

Word Keys: diabetic retinopathy, oxidative stress, neural retina, outer blood retinal barrier, polyphenol, cocoa.

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