Rat aortic endothelial dysfunction induced by high glucose in vitro and its reversal by a proanthocyanidines-standardized Vitis vinifera seed extract.

Alvarez N., Cerda J., Gómez A., Guamán J., Lara N., Bustamante S., Morales M.

Lab. Farmacodinamia y Fitofarmacología,
Programa de Farmacología Molecular y Clínica,
ICBM, Facultad de Medicina, Universidad de Chile.

Abstract
Endothelial dysfunction is characterized by the diminished capability of endothelial cells to induce the relaxation of vascular smooth muscle. It is usually associated to a pleiotropically originated decrement of nitric oxide bioavailability. It is known that hyperglicemia induces oxidative stress through at least three pathways: sorbitol, PKC-activation, NADPH-oxidase activation which are traduced in overproduction of reactive oxygen species (ROS). Our aim was to stablish whether a 90% proanthocyanidines extract obtained from Vitis vinifera seeds, reduces the endothelial dysfunction induced in vitro by high glucose-oxidative stress.

Methods
Sprague-Dawley male rats (12) obtained from the Animal House of the School of Medicine, with a mean weight of 311,4 g (280 g – 330 g) were separated at random in three groups, water and food ad libitum and kept in standard conditions defined for experimental animals (NIH, 1985). It was determined isometric contraction and relaxation of rat aortic rings in vitro using a force-displacement transducer connected to a polygraph Grass FT-03. Rat aortic rings exposed to 11.5 mM Glucose (control or 1), 46 mM Glucose (high glucose or 2) and 46mM glucose plus Vitis vinifera seed extract (high glucose plus veratrum or 3), were contracted with 1 µ M phenylephrine, and then relaxed with 1x 10 -8 to 1x 10 -4 M acetylcholine.

Results
In the control group relaxation reached 97,40 + 4.79 %; group 2 exhibited a clear impairment of the acetylcholine-induced relaxation curve that reach to almost 50% decrement of endothelial-induced maximal vasodilation. Group 3 showed a maximal relaxation of 83,02 + 18,02.

Conclusions
Obtained results allow to conclude that EVv significantly reverts the aortic endothelial dysfunction induced by high glucose. It is probable that this effect be caused by the antioxidant properties of polyphenols contained in the Vitis vinifera seeds extract. These results will be analyzed in relation with diabetes oxidative stress and its vascular complications.

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