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AGGREGOMETRIC - CYTOMETRIC MONITORING OF THE ACTION OF VARIOUS ANTIOXIDANTS ON PLATELET ACTIVITY, FOR THE CLINICAL PREVENTION OF THROMBOEMBOLIC DIDEASES

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Introduction: Membranic platelet receptor GpIIb-IIIa contributes to platelet aggregation (PA) by binding fibrinogen. Administration of antioxidants (AO) to platelets inhibits PA.

Purpose: To investigate the possible inhibition of: a) PA and b) the operation of GpIIb-IIIa ex vivo, through administration of AO.

Materials and Methods: 28 healthy volunteers participated in the study as blood donors. The following AO were administered in their rich platelet plasma (PRP) in concentration 3 x 10^{-3} M per substance: 2,3-diphosphoglyceric acid (2,3-DPG), carvacrole, gloutathione (GSH), azoulene, bismuthiole, 2-methyl-2-nitroso-propane (MNP) and N-tert-butyl-α-phenylnitrone (PBN). The GpIIb-IIIa receptors were measured by ADIAflo Platelet Occupancy kit, American Diagnostica Inc. and the flow cytometer Epics XL-MCL-Beckman Coulter. PA tests to the PRP were implemented with epinephrine (EPN), thrombine (THR), arachidonic acid (AA), PAF and ADP as activators. Same tests took place after administration of the under study AO in the PRP at 3 x 10^{-3} M concentration per substance. PA was calculated in a PICA Chronolog Co aggregometer.

Results: After the administration of the AO 2,3- DPG, carvacrole, GSH, azoulene, bismuthiole, MNP and PBN: a) the operation of the receptor GpIIb-IIIa decreased by 92, 99.4, 93, 91.5, 90, 95, and 89 % respectively and b) inhibition of PA was provoked at 87, 94, 88, 84, 83, 91 and 82% respectively.

Conclusions: Antioxidants contained in many plants and fruits and known to be free oxygen radicals scavengers, are possible to act at the level of platelet receptors GpIIb-IIIa inhibiting their function and in this way averting the configuration of platelet clotting. Based on these given facts, they could be used complimentary to the prevention of thromboembolic diseases.