Evaluation of 1,2,3 Triazoles Effects on Platelet Aggregation and Coagulation

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Introduction: Vascular disorders, as thrombosis and pulmonary embolism, represent a major cause of death worldwide. They occur due to disturb on the platelet aggregation and blood clotting processes. The treatment for such diseases is the administration of drugs, as heparin and their analogues. However, they have unsatisfactory efficacy and may produce significant side effects. For this reason, there is a need to search for new molecules that could replace and/or complement such therapies. So, the objective of this work was to evaluate, through in vitro assays, an antithrombotic potential of a series of 1,2,3-triazole derivatives, separated in family 1 (AM001 to AM006) and family 2 (AM007, AM011, AM012 and AM016).

Material and Methods: The effect of these derivatives on plasma clotting was investigated using Thrombin Time (TT), Prothrombin Time (PT) and activated Partial Thromboplastin Time (aPTT) tests, in a multichannel digital Coagulometer (Amelung, model KC4A). The effect of the derivatives on platelet aggregation was monitored in an Aggregometer (Chrono Log, model 490 2D) using Platelet-Rich-Plasma (PRP) from health volunteers donators. A theoretical toxicity study of the derivatives was conducted using Osiris Property Explorer software.

Results and Discussion: The derivatives of the family 1 and 2 interfered in plasma clotting and platelet aggregation, but with different potencies. The derivatives AM007 and AM016 prevented plasma clotting in the TT, PT and aPTT tests, and those from family 1 inhibited only PT. Moreover, derivatives inhibited collagen- and ADP-induced platelet aggregation, and AM005 and AM006 presented the highest percentage of inhibition (25 %). The derivatives of both families presented low theoretical toxicity profile. Conclusions: These results show promising aspects on the use of derivatives of 1,2,3 triazoles as a molecular model for the development of novel compounds with antithrombotic activity.

Support: CAPES, CNPq, FAPERJ and PROPPi-UFF.

Key-words: anticoagulation, antiplatelet, synthetic compounds, triazoles.