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Synthesis and evaluation of anti platelet aggregation activity of new thiohydantoin derivatives

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Thrombin formation and platelet aggregation are the main causes of stroke, thromboembolic and cardiovascular diseases which are the major reasons of morbidity and mortality.
Several anti platelet agents, with different mechanisms of action, have been discovered such as aspirin and clopidogrel. Oral platelet medications which are currently being used in clinic, despite their efficacy, exhibit some side effects such as bleeding and gastrointestinal ulcers. Therefore, medicinal chemists are still trying to find new drug candidates in this field.
In the present study a group of thiohydantoin derivatives was considered for synthesis based on the existing knowledge regarding structure and anti platelet activity for these compounds.
Phenylisothiocyanate in reaction with different amino acids gave thiourea intermediates which were then converted to the desired thiohydantion derivatives in acidic condition provided by addition of HCl. The synthesized compounds were characterized using 1H-NMR, ESI-MASS and IR spectroscopy. The invitro anti platelet activity of these compounds was evaluated using arachidonic acid (AA) and adenosine diphosphat (ADP) as aggregation inducers and some of the compounds showed satisfactory results.

Keywords: Imidazoline, Platelet aggregation, Thromboxane, GP IIb/IIIa receptor