Abstrakt v angličtině

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Haemostasis is a complex physiological process which leads to a spontaneous stop of the bleeding from a damaged blood vessel. However, the aggregation of blood platelets followed by thrombus formation in coronary arteries damaged by atherosclerosis is the key risk factor for development of acute myocardial infarction.

The antiplatelet therapy is a basic intervention in prevention and treatment of cardiovascular diseases. The current treatment procedures are able to decrease the occurrence of cardiovascular incidents, but are linked to a higher risk of bleeding and in some resistant cases are not effective at all. Therefore it is important to search for new antiplatelet medications that will have more favourable properties and that will ensure treatment free of many limitations.

This study analysed the mechanism of action of antiplatelet effect in three 5,7-dihydroxy-4-methylcoumarin compounds that were proved to decrease platelet aggregation after application of arachidonic acid in the similar concentration such as acetylsalicylic acid (ASA). On that account we tested their effect on three levels of aggregation induced by release of arachidonic acid.

None of the tested substances influenced the thromboxane synthase activity; however, all of the coumarins inhibited cyclooxygenase-1 and prevented aggregation evoked by application of thromboxane analogue, hence suggesting their activity on its receptors or subsequent levels of aggregation. 5,7-Dihydroxy-4-methylcoumarins were even more potent inhibitors of cyclooxygenase-1 than ASA. The most effective of the tested coumarins was the 3-ethoxycarbonylethyl-5,7-dihydroxy-4-methylcoumarin. This

same substance also demonstrated the strongest antagonistic effect on thromboxane receptors.

To conclude, it can be stated that the tested 5,7-dihydroxy-4-methylcoumarins appear to be promising candidates for possible extension of current antiplatelet treatment. This is due to their effectiveness comparable to ASA and their positive influence on two different levels of the platelet aggregation.