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Vessels and Endothelium

12.3 Platelet Cyclic GMP Levels and the Aggregating Response to Adrenaline in Essential Hypertensive patients

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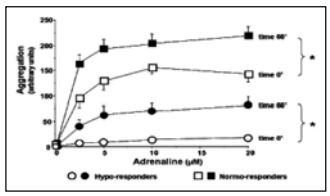
Introduction. A variable in vitro aggregating response to adrenaline (A) has been described in human platelets. Nitric oxide inhibits platelet aggregation via the second messenger cyclic GMP (cGMP). In essential hypertensive patients (EH) we tested whether platelet aggregation to A is affected by intraplatelet levels of cGMP.

Methods. From 39 untreated, grade I-II, supine EH (age 44±2 yr, M/F 30/9, smoke y/n 12/27, BP 141/92±3/2 mmHg, HR 75±2 bt/min) peripheral venous blood was sampled for platelet cGMP (RIA on acid extracts of washed platelets) and for platelet aggregation to A (final concentration 20, 10, 5, 2.5 µM, turbidimetric method on platelet rich plasma, PRP); aggregation was tested at time 0 and after 60 minutes of PRP incubation at room temperature. Data are expressed as means±sem.

Results. At time 0, the dose-response curve of platelet aggregation to A was blunted in 16 EH (hypo-responders) compared to 23 normo-responders (215±25 vs 2617±248 auc, arbitrary units, $p<0.01$) (see figure); after 60 minutes, the response was similarly increased in both groups (+988±258 vs +1092±262 auc, ns) and the difference between hypo- and normo-responders was still significant ($p<0.01$). Platelet cGMP was 9.3±1.0 vs 7.0±0.4 pM/109 cells in hypo- vs normo-responders, respectively ($p<0.05$); no differences in the haemodynamic parameters were observed between the groups.



Conclusions. Higher levels of cGMP in resting platelets of EH are associated with a blunted in vitro aggregating response to adrenaline; the inhibitory effect tends to decrease over time, although it persists over the 60 minutes of the study.