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HEMOSTASIS AND HEMORHEOLOGY AFTER ISCHEMIC STROKE IN PATIENTS WITHOUT CARDIOPATHY AND OTHER LOCALISATION OF ATHEROSCLEROSIS

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Hemorheological parameters (whole blood filtration, whole blood viscosity, plasma viscosity and erythrocyte deformability by ektacytometry) and fibrinolysis parameters (Euglobulin Lysis Time ELT, t-PA activity, and Plasminogen Activator Inhibitor -PAI- before and after Venous Occlusion Test -VOT-) were measured in 20 stroke patients. All these patients had a crerebrovascular accident (CVA) localised to the carotid arterial tree. They has no signs of heart disease and were without risk factors for atherosclerosis (high blood pressure, diabetes) ; they were investigated in the week following the CVA. They were divided into 4 groups : 1/ transcient ischemic accident, 2,3,4/ size of infarct classified from results of C.T.Scan carried out 2 or 3 days after the stroke (2/small +, 3/moderate ++, 4/large +++).

For the hemorheological parameters we noted only a slight increase in whole blood filtration (27±8" vs 21±2", p<0,05).

The ELT was however significantly increased in these patients (258 ± 57 min. vs 133 ± 33, p < 0,001) suggesting impairement of fibrinolysis. The following points were noteworthy : the ELT return to normal after to VOT, there was a relationship between stroke severity and the PAI levels and the viscosity at low shear stress. These two parameters were dramatically impaired in the most severely affected patients. Transcient ischemic accidents had comparable features to the CVA of moderate size.

The extend of the disorders of the hemorheological disorders and the abnormalities in fibrinolysis seemed to be related to the severity of the involvement in patients with ischemic stroke with no evidence of heart disease or atherosclerosis in other systems.

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LONG TERM EFFECTS OF TICLOPIDINE ON FIBRINOGEN AND HAEMORHEOLOGY IN PATIENTS WITH PERIPHERAL ARTERIAL DISEASES. G. Palareti, P. Torricelli, M. Poggi, G. Fortunato, G. Oca, S. Coccheri. Dept of Angiology and Blood Coagulation, University Hospital S. Orsola, Bologna, Italy.

Fibrinogen (Fgn) and haemorheologic parameters were serially measured in 44 pts (38 males, age 59+/-7) with claudicatio intermittens due to peripheral arterial obliterative disease (PAOD) treated for 24 months with Ticlopidine (T group, 250 mg b.i.d. p.os), or placebo (P group), in a double blind randomized controlled study, part of a larger clinical trial. Fgn (immunodiffusion), haematocrit (Ht, micromethod), whole blood viscosity (BV, Contraves LS 30, at 37 C) at high (94.5) and low (0.2 sec-1) shear rates (s.r.) and plasma viscosity (PV, Contraves LS 30) were measured three-monthly. The data were evaluated by means of ANOVA and Student's t test. The values in groups T and P did not differ at baseline except for greater BV at high s.r. in group P ($p < 0.05$). During the observation period circannual variations appeared especially in group T, where summer-time values for most parameters (Fgn, Ht, PV, low s.r. BV) were lower (significance from $p < 0.05$ to < 0.01) than the correspondent winter-time values, while a similar pattern was observed in group P only for PV ($p < 0.01$). Fgn ($p<0.05$), Ht ($p<0.01$), and low s.r. BV ($p<0.001$) were significantly lowered in group T versus group P but only in the summer months (after about 1 year of treatment). In conclusion, this study proves that long-term Ticlopidine treatment in PAOD is associated with significant lowering of fibrinogen and "improvement" in haemoreologic tests although limited to the summer observations. Ticlopidine while positively interfering with haemorheology in PAOD may not counteract other mechanisms of rheologic deterioration probably occurring during winter. Long-term evaluation of drug effects should therefore take into account spontaneous or drug-enhanced seasonal changes of the investigated values.

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HEMORRHEOLOGY AND KETANSERIN. J. De Crée, H. Geukens, B. Demoen and H. Verhaegen. Clinical Research Unit St. Bartholomeus, Jan Palfijn Hospital, B-2060 Merksem (Belgium).

Red blood cell (RBC) filtration in platelet rich plasma (PRP) and platelet poor plasma (PPP) was equally decreased ($p < 0.0001$) in 120 patients with acute myocardial infarction (AMI) as compared to a control group. In a double-blind experiment 2 groups of 30 patients with AMI received an acute oral dose of 60 mg of ketanserin, a serotonin (5-HT) antagonist at 5-HT_2-receptors, or placebo. Ketanserin treatment improved RBC filtration in PRP with an average increase of 30%. A similar experiment using PPP showed a significant increase of 10%. Filtration of plasma improved after ketanserin treatment in PRP, but not in PPP. Cross-exchange experiments showed the ketanserin-induced improvement of RBC filtration in PRP and PPP to be also plasmadependent. 5-HT in vitro at 10^{-9}M deteriorated RBC filtration in PPP ($p < 0.05$), and ketanserin in vitro at 10^{-7}M counteracted this phenomenon ($p < 0.001$). Finally we found that the effect of a subacute treatment with ketanserin on the filtration of RBC suspensions, enriched with a constant amount of white blood cells (WBC), was more pronounced than on control RBC suspensions of patients with AMI.

These results indicate that the impaired RBC filtration, reported in vascular diseases may be dependent on a subtle interaction between platelets, WBC, RBC and plasma. Treatment with ketanserin is capable to interrupt this vicious circle of rheological disturbances at different levels, first of all, by improving RBC deformability, but also by counteracting the platelet mediated effects on RBC and by favourably influencing the physical properties of WBC and so preventing clogging phenomena. Serotonin probably plays a pivotal role in these cascade of events and therapy with ketanserin might be of clinical value in diseases where microcirculatory flow is compromised.

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VERY LARGE AND COMPACT AGGREGATES OF RED CELLS IN HEART DISEASE AND CANCER: POSSIBLY AN ANALOGOUS ROLE IN THE MICROCIRCULATION AS PLATELET AGGREGATES. L. Dintenfass. Department of Medicine, University of Sydney, Australia 2006.

Very large aggregates of red blood cells, showing compact morphology, are easily observed in vitro, and might be of importance in the in vivo microcirculation. Blood from patients with myocardial infarction, Waldenström's macroglobulinaemia, or varoous carcinomas. etc., was anticoagulated with EDTA, and adjusted to haematocrit of 0.30, using native plasma. All tests were carried out in the slit-capillary photoviscometer, at temp. of 22°C. Micro and macrophotographs were taken during flow and stasis, using slits of 12.5 and 50 micron gaps. Studies showed that very large (two-dimensional) red cell aggregates are formed, such aggregates (clumps) containing up to 50,000 red cells in a single clump. The architecture of such aggregates differed according to the origin of blood: both rouleaux type and random / compact type of aggregates were observed; in principle, a spectrum of morphologies can be seen. These observations form a link between the earlier work of FAHRAEUS, on the one hand, and that of KNISELY, on the other; which works appeared at the time to be contradictory and irreconcilable.

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