HARMOSTATS AND HIGH ALTITUDE. J. Singh and I.S. Chohan. Directorate General Armed Forces Medical Services, New Delhi, India.

On arrival at high altitude there is a tendency towards hypercoagulation associated with an increase in platelet count, factors X and XII, and thromboplastin activity (TA) which is reflected by decrease in prothrombin time (PT), bleeding time (BT), clotting time in glass (CT-g), and stypten time (ST). Clot retraction is impaired. This hypercoagulation state is countered by a compensatory rise in fibrinolytic activity reflected by reduction of clot lysis time (CLT), plasma fibrinogen, and factor VIII.

This hypercoagulation state persists throughout the early fortnight after arrival at high altitude and then starts regressing. On day 3, factor V decreases, BT, and ST are further reduced, and factor VIII shows a rise. On day 7, a progressive rise occurs in factors V, VIII, X and XII, TA, platelet counts and platelet factor 3 (PF-3). CT-g1, CT-g, PT, and ST are further shortened. On day 14, hemostatic rises and of all the parameters, factors V and X and clot retraction return to normal. Throughout the fortnight, factor XII remains high, CLT is short, and platelet adhesiveness remains within normal range.

After 2 years' stay at high altitude, a regression in hypercoagulability occurs and is indicated by persistent short CLT, prolonged ST, CT-g, PF and reduced TA. Platelet adhesiveness, PF-3, factors V, VIII and XII and clot retraction are restored to normal.

BLOOD COAGULATION IN HIGH ALTITUDE PULMONARY HYPERTENSION. J. Singh and I.S. Chohan. Directorate General Armed Forces Medical Services, New Delhi, India.

Blood coagulation studies were carried out in 36 Indian soldiers who were resident at altitudes between 3690 and 5540 m for 2 years. Compared with 16 sea-level controls, 6 of these 36 subjects who had developed pulmonary hypertension during their stay at high altitude showed a significant increase in platelet probability, fibrinogen, fibrinolytic activity, platelet adhesiveness, platelet factor 3, factor V, and factor VIII. In the remaining 32 subjects who did not develop pulmonary hypertension there was a significant increase of plasma fibrinogen and fibrinolytic activity only.

The above differences between subjects who develop pulmonary hypertension to high altitude and those who do not develop pulmonary hypertension suggest that high-altitude pulmonary hypertension is of non-obstructive origin and is dependent on changes in blood coagulation at high altitude.

THROMBOGENIC STUDY TO PREDICT EPISODES OF THROMBOGENESIS. A. Kurotani, Research Institute for Nuclear Medicine and Biology, Department of Medicine, Hiroshima University, Hiroshima, Japan.

To predict thrombosis and to evaluate anti-thrombotic agents, a thrombogenic study was done on subjects in thrombogenic state with cardio-vascular and hematologic diseases, artificial heart valve replacement, thromboangiitis and thromboembolism. Platelets were labelled with 51Cr (Throm. Res. 8, Suppl. 11: 347, 1976). During thrombocytosis (>100000/µl), 2 of 4 cases with primary thrombocytopenia and 3 of 4 cases of chronic myelogenous leukemia (2 of whom developed thrombosis) had abnormal survival. This decreased turnover reflected increased production of platelets and increased thrombopoiesis. Fourteen cases with artificial heart valve replacement showed short survival with proportionally higher turnover. Three cases with short survival despite high doses of dipyriramole therapy developed thrombosis.

To evaluate platelet participation in the development of cerebrovascular lesions; cerebral infarction and/or bleeding in animal model, platelet survivals were measured by 57Co-acinarin incorporated in the spontaneously hypertensive rat-stroke prone strain (SHR-SP, Okamoto-Yamori), which become hypertensive at age 3-25 weeks. Peak of 75Se-methionine in platelets which develop hypertension at age, 1-25 weeks occur on 3rd. day after I.P. injection in SHR-SP and controls (SHR-stroke resistant and normotensive Wistar rat), and was significantly higher in SHR-SP than the controls. Survivals by 75Se-methionine and by 54Cr labels (16th Int. Congr. Hemat. Sept. 1976, Kyoto, Abstr. Spp. 3-12-4, pp. 39) suggested shorter survival of SHR-SP in 10-15 weeks of age than control. Short survival with increased turnover indicated increased consumption due possibly to vascular damage associated with the development of hypertension. Ability to predict strokes in adult rats has been examined.