

Thesis Title Effect of standardized hemorrhage on
 liver functions in hypoxia
 acclimatized rats

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Date of Graduation 5 April B.E. 2533 (1990)

ABSTRACT

Experiments were undertaken with rats to determine the effect of standardized hemorrhage at sea level on some blood parameters and plasma enzymes which related to liver functions in rats chronically exposed to hypoxia at a simulated high altitude of 5,000 m. Thirteen control rats and 11 hypoxia acclimatized rats were bled at sea level into a reservoir which maintain mean arterial blood pressure (mABP) at 35 mmHg. At 150 min of standardized hemorrhagic hypotension, all shed blood remaining in the reservoir was reinfusion (>30 %MBL). Liver function tests were studied during hemorrhagic hypotension starting from the point of initial blood withdrawal, 40-60 min of hypotension and at 10 min after blood reinfusion at the end of 150 min hypotension. Changes in hematocrit, plasma glucose, blood lactate, plasma protein, BUN, and plasma enzymes (AST, ALT, LDH and

CPK) were measured. Liver, heart, kidney and skeletal muscle were removed quickly after the last blood withdrawal. The initial and the maximum blood withdrawal, and the time to maximum blood loss were significantly greater whereas the blood volume reinfused to maintain the level of hypotension was less in the hypoxia exposed rats than those for control rats. The higher tolerance to standardized hemorrhagic shock in altitude exposed rats seemed to be due in part to their more efficiency in liver function. Aminotransferase (AST, ALT) and lactate dehydrogenase (LDH), were elevated with the time of hypotension in both animal groups. This indicates that hepatic cell injury occurs in hemorrhagic shock. The similar changes in plasma enzymes activities, plasma glucose and BUN levels in both animal groups with the less significantly increased in blood lactate concentration during hemorrhagic hypotension in hypoxia acclimatized rats than the control rats indicate that hepatic cells damage was probably similar among the two animal groups while the remained functional capacity of the liver was more effective in the hypoxia exposed group. It is, therefore, possible that the less degradation in liver functions of the post-altitude rats may account, in part, for their increased tolerance to hemorrhagic shock.