

Effects of Different Load on Physiological, Hematological, Biochemical, Cytokines Indices of Zanskar Ponies at High Altitude

Authors : Prince Vivek, Vijay Kumar Bharti, Deepak Kumar, Rohit Kumar, Kapil Nehra, Dhananjay Singh, Om Prakash Chaurasia, Bhuvnesh Kumar

Abstract : High altitude native people still rely heavily on animal transport for logistic support at eastern and northern Himalayas regions. The prevalent mountainous terrains and rugged region are not suitable for the motorized vehicle to use in logistic transport. Therefore, people required high endurance pack animals for load carrying and riding. So far to the best of our knowledge, no studies have been taken to evaluate the effect of loads on the physiology of ponies in high altitude region. So, in this view, we evaluated variation in physiological, hematological, biochemical, and cytokines indices of Zanskar ponies during load carrying at high altitude. Total twelve (12) of Zanskar ponies, mare, age 4-6 years selected for this study, Feed was offered at 2% of body weight, and water ad libitum. Ponies were divided into three groups; group-A (without load), group-B (60 kg), and group-C (80 kg) of backpack loads. The track was very narrow and slippery with gravel, uneven with a rocky surface and has a steep gradient of 4 km uphill at altitude 3291 to 3500m. When we evaluate these parameters, it is understood that the heart rate, pulse rate, and respiration rate was significantly increased in 80 kg group among the three groups. The hematology parameters viz. hemoglobin significantly increased in 80 kg group on 1st day after load carrying among the three groups which was followed by control and 60 kg whereas, PCV, lymphocytes, monocytes percentage significantly increased however, ESR and eosinophil % significantly decreased in 80 kg group after load carrying on 7th day after load carrying among the three groups which were followed by control and 60 kg group. In biochemical parameters viz. LA, LDH, TP, hexokinase (HK), cortisol (CORT), T3, GPx, FRAP and IL-6 significantly increased in 80 kg group on the 7th day after load carrying among the three groups which were followed by control and 60 kg group. The ALT, ALB, GLB, UR, and UA significantly increased in 80 kg group on the 7th day before and after load carrying among the three groups which were followed by control and 60 kg group. The CRT, AST, and CK-MB were significantly increased in 80 kg group on the 1st and 7th day after load carrying among the three groups which were followed by control and 60 kg group. It has been concluded that, heart rate, respiration rate, hematological indices like PCV, lymphocytes, monocytes, Hb and ESR, biochemical indices like lactic acid, LDH, TP, HK, CORT, T3, ALT, AST and CRT, ALB, GLB, UR, UA, GPx, FRAP and IL-6 are important biomarkers to assess effect of load on animal physiology and endurance. Further, this result has revealed the strong correlation of change in biomarkers level with performance in ponies during load carry. Hence, these parameters might be used for the performance of endurance of Zanskar ponies in the high mountain region.

Keywords : biochemical, endurance, high altitude, load, ponies

Conference Title : ICAPB 2018 : International Conference on Animal Physiology and Behavior

Conference Location : New York, United States

Conference Dates : August 27-28, 2018