

Human Adaptation to High Altitude: Body Proportion Analysis Using Phantom Model

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ABSTRACT Altitude variation in body proportion was studied on the basis of data collected on 345 Bod boys ranging in age from 12 to 18 years. High altitude (3514m) sample (n = 233) was collected from the town of Leh (Ladakh, Jammu and Kashmir, India) and villages in its vicinity, whereas low altitude (1200m 2000) sample (n = 112) was collected from the Kullu valley (Himachal Pradesh, India). Higher proportionate lean body mass, bicondylar humerus, and lower proportionate fat and skinfolds indicate that the body proportion of the highlander Bods is studied to undertake hard work under the rarefied atmosphere and difficult terrain. Even the rich fat diet and the advantage of fatty layer in the cold climate has not allowed an increase in fat depositions. Highlander Bods have higher proportional chest dimension than the lowlanders. In view of the researcher's earlier observation that highlander Bods have higher lung functions and they have strong relationship with the chest dimensions, it seems justified that the enlarged chest may be a structural modification to the function. It is also evident from the results that different body measurements respond differently to the stress of high altitude. Some measurements depict retardation, while others show advancement in growth. Also, the environmental response is not uniform in all high altitude populations. The differences accrue because of variation in genetical make-up, ecosensitivity, socio-cultural factors, and degree, kind and amount of stress.