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Body Morphology and Respiratory Functions in Bodhs of Changthang of Ladakh, Jammu and Kashmir, India

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KEY WORDS Bodhs. Changthang. Ladakh. Body Morphology. Lung Functions.

ABSTRACT Stature, body weight and lung functions are being reported for 27 adult male Bodhs of Changthang, age ranging from 20 to 50 years. The sample have been collected from Changthang, situated at an altitude 4050 metres (13,300 feet) above mean sea level of Leh district of Ladakh, Jammu and Kashmir state. Bodhs of Changthang are lighter and shorter than neighbouring population groups but show higher lung functions, when compared with other population groups of the state.

Millions of people of the world live permanently at elevation of 3000 metres or higher and are exposed to harsh environment known as high altitude in physiological parlance, which infact comprises of a constellation of stresses namely hypobaric hypoxia, cold, rugged terrain, high dosages of ultra-violet rays, iodine deficiency and limited natural resources. Since long, man has been cognisant of the fact that conditions of life are usually harder, and breathing is more difficult at high-altitude areas and that striking morphological and physiological differences exist between high and low altitude populations (Clegg et al., 1970). The recent phase of multidisciplinary studies on high altitude human biology began as a part of the IBP programme on indigenous high altitude populations of the Andes, Simien, Tien Shan and the Pamirs and the Himalayas. In the present study, an attempt has been made to study stature, body weight and lung functions of high altitude Bodhs of Changthang area of Leh district of Ladakh division of Jammu and Kashmir State. The population under study stay at an altitude of 4050 metres (13,300 feet) above mean sea-level in village Nyoma (Block headquarters) and around in Changthang sub-division.

MATERIAL AND METHODS

Data on 27 adult males belonging to Buddhist group were collected from village Nyoma and around of Changthang subdivision of Leh district of Ladakh division of Jammu and Kashmir State in 1991. The subjects ranged from 20 to 50 years of age; average being 32.55. Most of the men of the area work as army labourers, do shop keeping, government jobs, animal husbandry and agriculture. The measurement on each subject were taken following standard techniques (Weiner and Lourie, 1969; Singh and Bhasin, 1989). The lung functions were measured using Morgan's portable spirometer.

RESULTS AND DISCUSSION

The mean values and standard deviations for various variables of Bodhs of Changthang are given in table 1. Bodhs of Changthang weight 49.0 kg. and measure on the average 160.50 cm. They are higher than Tibetans of Leh town; Gujjars; Dogra Brahmans, - Rajputs, - Scheduled Castes of Jammu; Tibetans of Dalhousie; Gaddi - Rajputs, - Brahmins of Chamba (Bhasin and Singh, 1991a; Singh, 1980, 1981).

For stature also Bodhs of Changthang are shorter than Tibetans of Leh and Dalhousie; Gujjars; Dogra - Brahmans, - Rajputs, - Scheduled Castes of Jammu; Gaddi-Rajputs and - Brahmins of Chamba. For forced vital capacity (FVC) the present population group shows higher values than Ladakhi group (Nurboo et al., 1989) and Tibetans living in and around Leh (at about 3350 meters or 11,000 feet). Bodhs of Changthang also show higher forced vital capacity as compared to Dogra - Brahmans, - Rajputs, - Scheduled

Castes but Gujjars a transhumant tribe show higher forced vital capacity than the population under study. The higher value of forced vital capacity of Gujjars as compared to Changthang people may be due to sample size.

Table 1: Body variables of Bodhs of Changthang of Ladakh, Jammu and Kashmir, India

S.No.	Particular	Mean	S.D.
1.	Age (years)	32.55	12.93
2.	Height Vertex (cm)	160.48	5.85
3.	Body Weight (kg)	49.07	7.06
4.	Forced Vital Capacity (FVC-lit)	3.81	0.90
5.	Forced Expiratory Volume in one second (FEV 1.0)	3.09	0.69
6.	Peak Expiratory Flow (PEF-ml)	367.05	98.42
7.	Height-Weight Ratio (HWR)	30.54	4.12
8.	Body Mass Index (BMI)	19.04	2.59
9.	Ponderal Index (PI)	44.55	1.78
10.	Body Surface Area (BSA-m^2)	1.48	0.11

For forced expiratory volume (FEV 1.0) and peak expiratory flow (PEF) also Bodhs of Changthang show higher values than Ladakhis and Tibetans of Leh; Gujjars; Dogra - Brahmans, -Rajputs, - Scheduled Castes of Jammu (Nurboo et al., 1989; Bhasin and Singh, 1991a,b). The higher value of various lung functions in the population under study as compared to other population groups of the state may be due to comparatively higher altitude and high terrain activity.

The values of height-weight ratio (HWR), and body mass index (BMI) have been observed to be lower than Gujjars; Dogra - Brahmans, - Rajputs, - Scheduled Castes and Tibetans of Jammu and Kashmir state. Ponderal index of Bodhs of Changthang is higher than Gujjars, Dogra-Rajputs and Tibetans but lower than that of Dogra-Brahmans and - Scheduled Castes. Bodhs of Changthang extibit smaller body surface area when compared to Dard Bodhs and Tibetans of Ladakh; Gujjars; Dogra - Brahmans, - Rajputs, - Scheduled Castes of Jammu.

Malik and Singh (1979) Singh and Bhasin (1983) Bhasin and Singh (1990, 1991b) have shown that lung functions are closely related body weight to followed by stature whereas for Bodhs of Changthang, it has been observed that lung functions are more closely related to stature as compared to body weight (Table 2).

Table 2: Co-efficient of correlation 'r' in Bodhs of Changthang between lung functions and stature, and body weight

Varible	FVC	FEV 1.0	PEF
Height Vertex	0.52	0.30	0.36
Body Weight	- 0.04	0.09	- 0.12

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