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A Study of Body Morphology and Lung Functions in Dards of Ladakh, Jammu and Kashmir, India

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

ABSTRACT Lung function, stature and body weight has been studied for a high altitude population group Dard Bodhs of Ladakh. A sample of 30 adult males of 20 to 50 years of age has been included in the present study. Dard Bodhs show lower stature and body weight than population groups of plains but higher lung functions than other population groups of the state of Jammu and Kashmir.

The high altitude zones have generated a lots of interest among anthropobiologists because of recommendation of the International Biological Programme (Human Adatability Section) to study the people inhabiting these areas under great environmental odds. The major factors prevailing at high altitude include low oxygen pressure, cold, greater intensity of ultra violet rays, rough and rugged terrain etc. though the intensity of certain factors may differ in different zones (Clegg et al., 1970). Keeping this in view, in the present study an attempt has been made to study a small endogamous community Dard Bodhs of Ladakh residing at 2945 meters (9690 feet) above mean sea level in the Inner Himalayan Zone.

MATERIAL AND METHODS

Data on 30 males of Dardic Bodh group were collected from village Bema and around of Khaltse sub-division of Leh district of Ladakh of Jammu and Kashmir State in 1991. The subjects were un-related healthy males ranging from 20 to 50 years; average age being 32.93 years. They are endogamous community and claim to be pure Aryans. They were referred to as 'Minaro' by Michel Peissel in his controversial book. The men folk of the area is engaged in agriculture, animal husbandry, army labourers and government jobs.

Measurements on each subject were taken following standard techniques (Weiner and Lourie, 1969; Singh and Bhasin, 1989). The lung functions were studied using Morgans portable spirometer.

RESULTS AND DISCUSSION

The results of the present study are given in table 1. Dard Bodhs weight 53.70 kg. and are 165.57 cm in stature. Dard Bodhs weigh less than Bodhs, Baltis and Tibetans of Ladakh division; Gujjars; Dogra - Brahmans, - Rajputs, - Scheduled Castes of Jammu. They however show higher body weight than Bodhs of Changthang; Gaddi - Rajputs and - Brahmins of Bharmour staying at high and low altitude respectively (Singh, 1981; Bhasin and Singh, 1992). For height vertex Dard Bodhs are taller than Bodhs and Tibetans of Ladakh; Bodhs of Changthang whereas Baltis of Ladakh; Gujjars; Dogra -Brahmans, - Rajputs, - Scheduled Castes; Gaddi - Brahmins and - Rajputs show higher stature than the present population group understudy (Bhasin and Singh, 1991b).

For forced vital capacity (FVC) the Dard Bodhs show less value than Ladakhis of Leh town and around, Bodhs of Changthang but higher value of forced vital capacity than Dogra - Brahmans, - Rajputs, - Scheduled Castes and Tibetans. For forced expiratory volume in one second (FEV1.0) and peak expiratory flow (PEF) however Dard Bodhs show higher value than Ladakhis and Tibetans of Leh (Nurboo et al., 1989) and around, Bodhs of Changthang; Gujjars; Dogra - Brahmans, - Rajputs, - Scheduled Castes of Jammu.

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

S.No.	Particular	Mean	S.D.
1.	Age (years)	32.93	11.58
2.	Height Vertex (cm)	165.57	6.94
3.	Body Weight (kg)	53.70	9.25
4.	Forced Vital Capacity (FVC-lit)	3.66	0.78
5.	Forced Expiratory Volume in one second (FEV1.0)	3.16	0.47
6.	Peak Expiratory Flow (PEF - ml)	402.47	75.45
7.	Height-Weight Ratio (HWR)	32.32	4.65
8.	Body Mass Index (BMI)	19.49	2.40
9.	Ponderal Index (PI)	44.67	1.68
10.	Body Surface Area (BSA-m^2)	1.58	0.15

The values of height-weight ratios for Dard Bodhs have also been compared with population groups staying around. They show higher height-weight-ratio (HWR) than Bodhs of Changthang but Bodhs, Baltis and Tibetans of Ladakh, Gujjars, and Dogras show higher value of HWR than Dard Bodhs of Ladakh. For body mass index (BMI) again Dard Bodhs show higher values than Bodhs of Changthang, Baltis of Ladakh but Bodhs and Tibetans of Ladakh; Gujjars; Dogra - Brahmans, - Rajputs, - Scheduled Castes of Jammu show higher body mass index than the present population. For ponderal index also Dard Bodhs show higher value than other population groups of Jammu and Kashmir.

Dard Bodhs have almost similar body surface area (BSA) as shown by Tibetans of Ladakh; higher body surface area than Bodhs of Changthang. Gujjars; Dogra-Brahmans, - Rajputs -Scheduled Castes however show higher body surface area than present population group (Bhasin and Singh, 1991 c).

It has been shown by various studies (Malik and Singh, 1973, Singh and Bhasin, 1983, Bhasin and Singh, 1990, 1991a) that lung functions are related to body weight and stature. In most of these studies, it has been reported that lung functions are more related to body weight than stature, similar trend has been observed in Dard Bodhs.

From above discussion it is observed that Dard Bodhs show short stature and lesser body weight when compared to population of low altitudes but they show better lung functions than population groups of low altitude, as well as, various Ladakhi groups of higher altitude regions.

Table 2: Co-efficient of correlation 'r' in Dards of Ladakh for height, weight and lung functions

Varibles	FVC	FEV 1.0	PEF
Height Vertex	0.03	0.17	0.20
Body Weight	0.23	0.18	0.23

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