High prevalence of undernutrition among adult Kora Mudi tribals of Bankura District, West Bengal, India

KAUSHIK BOSE1*, SANJIB GANGULY1, HASINA MAMTAZ1, ASHISH MUKHOPADHYAY1, MITHU BHADRA1

1Department of Anthropology, Vidyasagar University, Midnapore-721 102, West Bengal, India

Received 6 March 2005; accepted 27 May 2005

Abstract A cross-sectional study was undertaken to determine the anthropometric profile and nutritional status of adult Kora Mudis, a tribal population of Bankura District, West Bengal, India, based on their body mass index (BMI). A total of 500 adult (18.0 < age ≤ 65.0 years) Kora Mudis from two villages (Phulberia and Siromonipur, approximately 160 km from Kolkata) were studied. Anthropometric measurements, including height, weight, circumferences, and skinfolds, were measured using standard protocols. BMI was calculated and utilized as a measure of nutritional status. The extent of undernutrition (BMI < 18.5) was found to be very high (52.2 %). The frequency of undernutrition was higher in women (56.4%) than men (48.0%), although this difference was not statistically significant. Using the World Health Organization criterion, the prevalence of undernutrition is classified as ‘very high’. In order to fully understand the causes and consequences of adult undernutrition, further research is needed not only among this ethnic group but also on the other tribal populations of India.

Key words: India, tribal population, Kora Mudis, body mass index, undernutrition

Introduction

The tribes of India comprise about 8% of the total population of the country, probably the largest tribal community population in the world (Topal and Samal, 2001). The Koras, whose mother tongue is Kora, an Austro-Asiatic language, are tribal inhabitants of three eastern provinces of India: West Bengal, Orissa, and Bihar. The majority of the Koras in West Bengal are found in the districts of Bardhaman, Puruliya, Medinipur, Birbhum, Bankura, and Hugli. Kora seems to be a generic name signifying the occupation of earth digging. They have four endogamous groups: Mudi Kora, Kurmi Kora, Nagbanshi Kora, and Dhangar or Orang Kora (Mandal et al., 2002). Information on Kora Mudis is extremely scanty and there is no published data dealing with their anthropometric characteristics.

Although adult nutritional status can be evaluated in many ways (Lohman et al., 1988; Lee and Nieman, 2003), the body mass index (BMI) is most widely used because its investigation is inexpensive, non-invasive, and suitable for large-scale surveys (James et al., 1988; WHO, 1995; Uljaszek and Kerr, 1999; Bose and Chakraborty, 2005; Khongsdier, 2005). Thus, BMI is the most established anthropometric indicator used for assessment of adult nutritional status (Moy and Atyia, 2003). In general, data are scarce on the nutritional status of the various tribal populations of India (Tanuja et al., 1995; Yadav et al., 1999; Yadu et al., 2000; Khongsdier, 2001, 2002, 2005; Gogoi and Sen-gupta, 2002; Sahani, 2003; Dash Sharma, 2004; Gusain, 2004; Bose and Chakraborty, 2005). In view of this, the objective of the present study was to report the anthropometric characteristics and determine the nutritional status, based on their BMI, of adult Kora Mudis.

Materials and Methods

Prior permission and ethical approval was obtained from local community leaders as well as relevant authorities before commencement of the study. Information on ethnicity, age, occupation, and educational status were obtained from all subjects with the help of a questionnaire. The data were collected from two villages, Phulberia and Siromonipur, in Bankura District of West Bengal. These villages (Figure 1) are located approximately 20 km from Bankura town (the district capital of Bankura District) and 160 km from Kolkata (the state capital of West Bengal). The residents of all houses in the two villages were contacted and a total of 500 adults (250 men and 250 women; 18.0 < age ≤ 65.0 years) were included in the study. The response rates were 72% and 86%, for men and women, respectively. The vast majority of the subjects were illiterate and very low-wage earning manual laborers, of low socio-economic status.

All anthropometric measurements were made by trained investigators using the standard techniques of Lohman et al. (1988). Height, weight, circumferences, and skinfolds were recorded to the nearest 0.1 cm, 0.5 kg, and 0.1 mm, respectively. Circumferences and skinfolds were measured using measuring tape and Harpenden skinfold callipers, respectively. Technical errors of measurements (TEM) were computed and were found to be within acceptable limits.
Body mass index (BMI) was computed using the following standard equation: \( \text{BMI} = \frac{\text{weight (kg)}}{\text{height (m}^2)} \).

Nutritional status was evaluated using internationally accepted World Health Organization (WHO, 1995) BMI guidelines. The following cut-off points were used: undernutrition, BMI < 18.5; normal, 18.5 \( \leq \) BMI < 25.0; overweight, BMI \( \geq \) 25.0.

We followed the World Health Organization’s (WHO, 1995) classification of the public health problem of low BMI, based on adult populations world wide. This classification categorizes prevalence according to percentage of a population with BMI < 18.5.

1) Low (5–9%): warning sign, monitoring required.
2) Medium (10–19%): poor situation.
3) High (20–39%): serious situation.
4) Very high (\( \geq \) 40%): critical situation.

Medians of all anthropometric variables and BMI were computed for each sex separately. The distribution of BMI in both sexes was not significantly different from normal according to Cox’s skewness test. Thus \( t \)-tests were performed to test for sex differences as well as differences in mean BMI with other ethnic groups. The chi-square test (Fischer’s exact test) was utilized to compute sex differences in nutritional status. All statistical analyses were undertaken using the Statistical Package for Social Science (SPSS) program.

Results and Discussion

The mean ages of both sexes (men: 32.7 years, SD = 11.3; women: 31.7; SD = 10.6) were similar. The median of height, weight, BMI, and other anthropometric variables of the Kora Mudis are presented in Table 1. The mean BMI of the Kora Mudis was very low (combined-sex mean BMI = 18.5), with women having a significantly (\( t = 2.08, P < 0.05 \)) lower mean than men (18.3 vs 18.7, respectively). A noteworthy point is that the mean BMI of adult Kora Mudi women was below the WHO (1995) cut-off point (BMI < 18.5) for undernutrition. The mean BMI of the Kora Mudis was significantly lower than those of the other tribal populations of India, as reported in several recent studies (Awaradi, 1992; Khongsdier, 2001, 2002, 2005; Gogoi and Sengupta, 2002; Sahani, 2003), but slightly higher than those reported among the Bathudi tribe of Orissa, India (mean BMI of men = 18.4; mean BMI of women = 17.9) (Bose and Chakraborty, 2005). Compared to other native populations world wide, adult Kora Mudis had a significantly lower mean BMI. For example, Kirchengast (1998) reported that among !Kung San of Namibia, the mean BMIs for men and women were 19.4 and 19.1, respectively.

Figure 2 summarizes the nutritional status of the present subjects based on BMI. Overall (i.e. the sexes combined), undernutrition (\( n = 261, 52.2\% \)) was found at a high frequency. There was no significant difference in the frequency of undernutrition between men (48.0%) and women.
(56.4%). The frequency of undernutrition among Kora Mudis was much higher than those recently reported in the other tribal populations of India (Awaradi, 1992; Yadav et al., 1999; Yadu et al., 2000; Khongsdier, 2001, 2002, 2005; Gogoi and Sengupta, 2002; Sahani, 2003). Using the World Health Organization criterion (WHO, 1995), the prevalence of undernutrition of Kora Mudis is classified as ‘very high’. Only among the Bathudi tribal populations of Orissa (Bose and Chakraborty, 2005) was the frequency of undernutrition higher (combined-sex 57.9%; men 52.7%; women 64.5%).

From the public health point of view, immediate nutritional intervention programs need to be implemented for this ethnic group. The mean BMI of the adult Kora Mudis was significantly lower than BMIs reported among various non-tribal ethnic groups of India (Ghosh et al., 2001, 2004; Griffiths and Bentley, 2001; Mahajan and Berringham, 2004; Yadav et al., 2004). The economic and health burden of high frequencies of adult undernutrition have been well documented (Ferro-Luzzi et al., 1992; Campbell and Ulijaszek, 1994; James et al., 1994; Naidu and Rao, 1994; Khongsdier, 2005). Endeavors should be made to study the consequences of the functional impairments commonly associated with low BMI in this ethnic group, and furthermore to ascertain relationship of the high rate of undernutrition with morbidity and mortality. Similar studies should also be undertaken with other tribal populations in India, since they constitute a sizeable portion of India’s entire population. Moreover, since undernutrition has several underlying causes (WHO, 1995; Lee and Nieman, 2003), future investigations should aim at identifying the likely cause(s) of high rates of undernutrition among the Indian tribal populations.

Acknowledgments

The authors would like to thank all individuals who participated in the study.

References


Mandal H., Mukherjee S., and Datta A. (2002) India—An Illus-


