



ELSEVIER

Contents lists available at ScienceDirect

HOMO - Journal of Comparative Human Biology

journal homepage: www.elsevier.com/locate/jchb

Anthropometric characteristics and evaluation of nutritional status amongst female brick field workers of the unorganized sectors of West Bengal, India

M. Sett, S. Sahu*

Ergonomics and Occupational Physiology Laboratory, Department of Physiology, University of Kalyani, Nadia, Kalyani 741235, West Bengal, India

ARTICLE INFO

Article history:

Received 31 October 2012

Accepted 9 October 2015

ABSTRACT

The purpose of the study is to evaluate the body composition and hand grip strength as indirect measures of nutritional status of 162 female workers and the status of the serum oxidative stress enzymes of 35 female workers engaged in the manual brick making units of the unorganized sectors of West Bengal, India.

Results show that the waist-hip ratio values (mean 0.79 vs. 0.83; $p = 0.0034$) are significantly greater amongst the brick carriers than the moulders. The body density (mean 1067.0 vs. 1056.0 kg/m³; $p < 0.0001$) is lower and the body fat % (mean 10.63% vs. 13.09%; $p < 0.0001$) of the brick carriers is significantly higher. The hand grip strength (HGS) (horizontal) of the brick workers in right (mean 379.52 vs. 267.72 N; $p < 0.0001$) and left (mean 268.78 vs. 162.79 N; $p < 0.0001$) hands are significantly greater than the control group. The serum malondialdehyde level is significantly higher (mean 99.97 vs. 160.21 nmol/mg of protein; $p < 0.0001$) but the superoxide dismutase level (mean 6.71 vs. 3.34 unit/mg of protein; $p < 0.0001$), glutathione level (GSH) (mean 3.93 vs. 2.11 µg/mg of protein; $p < 0.0001$) and glutathione-*s*-transferase (GST) activity (mean 5.4 vs. 2.73 nmole/min/mg of protein; $p < 0.0001$) are significantly lower than that of the control group.

* Corresponding author. Tel.: +91 33 2582 8750x353; fax: +91 033 2582 8282.

E-mail address: skcsahu@yahoo.co.in (S. Sahu).

The indirect nutritional assessments have shown that the women are poorly nourished. The hand grip strength is quite high in both groups of workers but consecutively decreases with the passage of time. Reduced levels of GSH and GST indicate that there is a higher level of reactive oxygen species inducing oxidative stress in the body. The probable causes of this state might be the intake of less nutritious food, polluted environment, excess ambient temperature and improper workstation.

© 2016 Elsevier GmbH. All rights reserved.

Introduction

Brick making has dominated construction work in India since antiquity and mainly belongs to unorganized sectors of the Indian economy (Gupta, 2006; Sett and Sahu, 2014). The lure of steady work draws migrants from around the country site to brickyards because they can no longer sustain themselves by farming. These manual brick manufacturing private enterprises employ a large number of female workers coming from lower socio-economic background (Sett and Sahu, 2008). Although the number of unorganized workers is significantly high in India, the availability of the statistical information regarding the actual number of people employed, health problems, their social life and other problems relating to their work culture and habits are not known. These workers neither undergo any training programmes nor are they sufficiently experienced (Sett and Sahu, 2009). Unorganized workers are greatly affected by the seasonal nature of the employment opportunities. These workers are recruited by employers on a seasonal basis, mainly from November to April/May. No work takes place during India's monsoon seasons (June to September) and in the festive season (October) (Sahu and Sett, 2010). The Government attention towards health, safety and social security of these workers is relatively poor compared to that of the organized sectors in India (Dev, 1998; Gupta, 2006).

Women have to perform dual role of both outside employees in harsh and hostile working conditions and managers of their homes and children. They are also at the risk of various types of illnesses. In a study by Vogt (2010), it was shown that the occurrence of maternal night blindness among brick field workers in India was 17.8%. This suggests that there could be a serious problem of vitamin A deficiency also among mothers working in the brick fields of West Bengal. Thus, nutrition is one of the main factors related to maintenance of good physical fitness and work performance. Malnutrition can decrease physical endurance and earning capacities of women, thus it has been pertinent to assess health related problems of these female workers. Important tools for evaluating the health status as well as nutritional pattern of individuals are anthropometric measurements and body composition assessment (Kruger et al., 2004).

Leeuwenburgh et al. (1999) showed that physical activity could create an imbalance between oxidant and antioxidant levels in the body. It has been suggested that oxidative stresses resulting from acute exercise in unadapted and adapted individuals can damage enzymes, protein receptors, lipid membranes, and DNA (Bejma and Ji, 1999). Volvaard et al. (2005) in their review article showed that the overproduction of reactive oxygen species (ROS) could result from variety of stressors such as exposure to workload, environmental pollution, excess physical exercise, etc. In the case of brick field workers, the workers were constantly exposed to heavy workload, environmental pollution and also excess physical exercise (Sett and Sahu, 2009). Thus, methods have been invented to assess the free radical induced oxidative damage *in vitro*. Recently, amongst these methods, the assessment of glutathione and its derivatives has been the prime choice. Simultaneously, assessments of protein damage, activity of superoxide dismutase and catalase and production of malondialdehyde have become the other potential methods (Jenkins, 2000).

There are two groups of female workers in brick manufacturing units whose main tasks are: (1) brick making and (2) carrying bricks. Female workers that carry raw bricks from the stacks in the field to the brick kiln and then carry baked bricks back from the kiln in order to stack them in some other places in the field are grouped into the brick carriers. Female workers that mix mud, carry the mud in

Download English Version:

<https://daneshyari.com/en/article/100026>

Download Persian Version:

<https://daneshyari.com/article/100026>

[Daneshyari.com](https://daneshyari.com)