HEALTH STATUS OF BRICK KILN WORKERS IN NORTH EAST INDIA

Ashish Mittal. Occupational Health and Safety Management Consultancy Services (OHS-MCS), New Delhi, India

Introduction India produces 200–250 billion clay bricks annually, the second largest producer of clay fired bricks, accounting for more than 10% of global production, in 1.500,000 to 2,00,000 brick kilns. Each brick kiln employs between 250–300 workers, bringing the total number of workers to approximately 20 million, which is roughly 4 per cent of a total of 459 million workers in India, of which almost 40% are women. The Brick Industry in India is characterised by traditional methods of production technology and seasonal work.

Methods The study was done in Tripura, a state in North East India to assess the impact of traditional brick manufacturing technology on the health of the workers. A convenient available sample of 94 workers from 4 brick kilns who have worked for 5 years or more were taken from the total population of 280 (including children) of these kilns. The workers were interviewed to obtain information on demographics and personal habits followed by a general physical medical examination, blood test with complete haemogram, random blood sugar levels and pulmonary function test. The data were analysed using MS Office Excel 2007 & Epi. Info 7.2.1.0 version.

Results The average age of workers is 34 years, 27% were female and 73% male workers. 53% worker are loaders, 29% moulders and 7% fire-workers, 75% being migrant workers, 49% being underweight, 51% anaemic, 78% have eosinophilia (younger workers were more affected, p value 0.04), 66% have low back pain.

Conclusion Brick kiln workers are suffering from high morbidity in Northeast India because of their work. This demands urgent attention for health and safety programs and should include regular in-service training emphasising health risks of brick kiln work, preventive measures, technological interventions etc. Health surveillance of workers would be highly beneficial in achieving better health status.

SILICA EXPOSURE AMONG YOUNG NEPALI BRICKWORKERS

David L Parker*. HealthPartners Institute, Minneapolis, MN, USA

Aim of special session In Nepal there are approximately 11,69 registered brick kilns in Nepal employing 2,50,000 people and up to 30% of workers are <16. Although there are few studies of brick kiln workers, both historic and recent data indicate that silica exposure is a problem with exposures often exceeding 15 times the threshold limit value (TLV).

Presenters: DL Parker, MD, Dr. S. K. Joshi, Dr. S. M. Thygerson, Seshananda Sanjel, Ph.D.

Objective To evaluate the airborne exposure concentrations of TSPM, RSPM and silica among brickfield workers including exposure of children workers (age >18 years).

Methods Personal samples for silica, respirable and total particulate and silica were collected following NIOSH methods. Logistic regression analysis adjusting age, duration of work and smoking status was used to estimate the odds ratios (ORs) for silica exposure. The exposure data were adjusted for age, smoking, and duration of work.

Results Among a total of 459 million workers in India, 20% are engaged in brick kiln work, with approximately 20 million workers involved in this occupation. The average age of workers is 34 years, with 27% being female and 73% male workers. The prevalence of low back pain among workers is 66%, with younger workers being more affected (p value 0.04).

Conclusion Brick kiln workers are suffering from high morbidity due to silica exposure. Health surveillance of workers is essential to achieve better health outcomes.
Results A total of 86 silica samples, 72 samples for RSP and 89 samples for TSPM were collected for the similar exposure groups (SEG) in the brick kilns. Among the SEGs, red brick loaders had the highest mean and maximum exposures to silica, RSP and TSP. To summarise, mean results were as follows for the red brick loaders, respectively for silica, RSPM and TSPM: 0.388 mg/m$^3$, 17.944 mg/m$^3$, 22.657 mg/m$^3$. Other SEGs also had exposures above recognised exposure limits to silica, RSP and TSP. Additionally, several SEGs had workers under the age of 18. Exposures were significantly high and results will be discussed.

Conclusions These findings indicate urgent action is required for protection of workers, including working children, from exposures and subsequent diseases associated with particulate matter and silica. Many other hazards exist in the brickfields including heat stress, acute injury and ergonomic hazards that should be addressed.

1634d BRICK KILNS OF NEPAL: RECOGNISING THE HAZARDS
Seshananda Sanjel. Kathmandu University, Dhulikhel, Kavre, Nepal
10.1136/oemed-2018-ICOHabstracts.1772

Objective To evaluate the airborne exposure concentrations of total suspended particulate matters (TSPM), reparable suspended particulate matters (RSPM) and silica in brickfields and the prevalence of respiratory symptoms and illnesses among brickfield workers.

Methods A cross-sectional study was conducted in Kathmandu valley targeting all the brickfield workers during February – March 2015. Out of 106 operating brick kilns in Kathmandu Valley, 16 kilns were selected for the study applying multi-stage probability proportionate to size (PPS) sampling technique. A total of 800 participants, 400 brick workers as exposed and 400 grocery workers as referent group were recruited for interviews. Samples for silica, respirable and total particulate were collected following NIOSH methods. One-way ANOVA along with Tukey’s test were applied to compare significance of the extent of particulate matters among similar exposure groups (SEGs). Bivariate and multivariate logistic regression analysis were carried out to evaluate association between respiratory symptoms/illnesses and participant groups (exposed and referent) and SEGs among brickfield workers.

Results Mean results were as follows for the SEGs, respectively for silica, RSPM and TSPM: red brick loading/carrying (RBL/C), 0.388 mg/m$^3$, 17.944 mg/m$^3$, 22.657 mg/m$^3$; green brick stocking (GBS), 0.204 mg/m$^3$, 5.886 mg/m$^3$, 16.271 mg/m$^3$; green brick moulding (GBM), 0.119 mg/m$^3$, 2.193 mg/m$^3$, 4.581 mg/m$^3$; fire master (FM), 0.111 mg/m$^3$, 3.452 mg/m$^3$, 3.435 mg/m$^3$; and for coal crushing/carrying (CCC), 0.098 mg/m$^3$, 7.478 mg/m$^3$, 7.094 mg/m$^3$. One-way ANOVA was conducted for silica, RSPM and TSPM showing significant relationships across the SEGs. The majority (55%) of brick workers complained of coughing during the previous year. The prevalence of chronic cough among this group was 14.3% compared to 6.8% for grocery workers. Brick workers were also significantly more likely to have chronic phlegm production while coughing, chronic bronchitis, wheezing, chest tightness and other chest illnesses. Among SEGs, green brick moulders were nearly six times more likely to experience chronic cough (OR: 5.80; 95% CI: 1.20 to 27.93; p: 0.028) with red brick loaders three times more likely to have chronic bronchitis (OR: 3.08; 95% CI: 1.26 to 7.51; p: 0.013) when compared with workers involved in CCC work. Age and duration of work were significant predictors for chronic cough (p=0.001 each). Age of workers (p=0.003) and smoking habit of workers (p=0.002) were significant predictors for causing chronic bronchitis. Smoking practice of the workers was a significant predictor of wheezing (p=0.018) and asthma (p=0.026) among work groups.

Conclusions All of the respiratory symptoms and illnesses were significantly high among brickfield workers. These findings indicate urgent action for protection of workers and prevention of diseases. Furthermore, the symptoms and illnesses are the clear signs that exposure to TSPM, RSPM and silica are affecting the brickfield workers.