J Pulm Respir Med 2018, Volume 8
DOI: 10.4172/2161-105X-C2-031

7th International Chronic Obstructive Pulmonary Disease Conference

Indoor air pollution and reduced lung function in biomass exposed women: A cross sectional study in Pune district, India

Rasmila Kawan
University of Heidelberg, Germany

Background: Worldwide, majority population rely on solid fuels for cooking and heating, mainly in low and middle-income countries. The inefficient use of such fuels in poorly ventilated conditions results in high levels of indoor air pollution, most seriously affecting women and young children.

Objectives: The main aim of this study was to measure and compare the lung function of the women exposed to biomass fuels and LPG fuels and relate it to the indoor emission, measured using a structured questionnaire, spirometer and filter based low volume samplers.

Methodology: This cross-sectional comparative study was conducted among the women (aged >18 years) living in rural villages of Pune district who were not diagnosed of chronic pulmonary diseases or any other respiratory diseases and using biomass fuels or LPG for cooking for a minimum period of five years or more. Data collection was done from April to June 2017 in the dry season. Spirometer was performed using the portable, battery-operated ultrasound EasyOne spirometer (Spirobank II, ndd Medical Technologies, Zurich, Switzerland) to determine the lung function over forced expiratory volume. The primary outcome variable was forced expiratory volume in 1 second (FEV_1). Secondary outcome was chronic obstruction pulmonary disease (post bronchodilator FEV_1/forced vital capacity (FVC) <70%) as defined by the Global Initiative for Obstructive Lung Disease. Potential confounders such as age, height, weight, smoking history, occupation, educational status was considered.

Results: Preliminary results showed that the lung function of the women using biomass fuels (FEV_1/FVC = 85% ± 5.13) had comparatively reduced lung function than the LPG users (FEV_1/FVC = 86.40% ± 5.32). The mean PM2.5 mass concentration in the biomass user's kitchen was 274.34 ± 314.90 and 85.04 ± 97.82 in the LPG user's kitchen. Black carbon amount was found higher in the biomass users (black carbon = 46.71 ± 46.59 μg/m³) than LPG users (black carbon =11.08 ± 22.97 μg/m³). Most of the houses used separate kitchen. Almost all the houses that used the clean fuel like LPG had minimum amount of the particulate matter 2.5 which might be due to the background pollution and cross ventilation from the houses using biomass fuels.

Conclusions: Therefore, there is an urgent need to adopt various strategies to improve indoor air quality. There is a lacking current state of climate active pollutants emission from different stove designs and identify major deficiencies that need to be tackled. Moreover, the advancement in research tools, measuring technique in particular, is critical for researchers in developing countries to improve their capability to study the emissions for addressing the growing climate change and public health concerns.

Rasmila.kawan@gmail.com